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EDITORIAL

Exercise is medicine: a call to action for physicians to assess and prescribe exercise

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Abstract

Engaging in regular physical activity is one of the major determinants of health. Studies have demonstrated the benefits of exercise in the treatment and prevention of most every common medical problem seen today. It is clear that patients who engage in an active and fit way of life, live longer, healthier, and better lives. For these reasons, every patient should be asked about exercise at every visit using an exercise vital sign (EVS) and, when needed, provided with an exercise prescription that encourages them to get 150 minutes or more moderate-to-vigorous physical activity. Physicians have an obligation to assess each patients exercise habits and inform them of the risks of being sedentary. Such an approach is critical to help stem the rising tide of deaths around the world due to noncommunicable diseases, which are so closely associated with a sedentary lifestyle.

Introduction

Exercise is a very powerful tool for both the treatment and prevention of chronic disease, for mitigating the harmful effects of obesity, and for lowering mortality rates. In fact, there is a linear relationship between activity level and health status. People who maintain an active and fit way of life live longer, healthier lives. In contrast, physical inactivity has an astonishing array of harmful health effects. People who are sedentary and unfit very predictably begin to suffer prematurely from chronic disease and die at a younger age. This association between disease and an inactive and unfit way of life exists in every age group: children, adults, and the elderly. The results of studies consistently show that those who are active and fit are healthier. For this reason, many have suggested that physical inactivity is the major public health problem of our time [1].

This strong connection between physical activity and health was highlighted in a series of articles that the journal Lancet published in 2012. The series reached this conclusion: "In view of the prevalence, global reach, and health effect of physical inactivity, the issue should be appropriately described as pandemic, with far-reaching health, economic, environmental, and social consequences [2]." Can you imagine the public outcry if such strong words had been used to describe a "pandemic" caused by an infectious disease or injury? You can bet there would have been numerous largescale campaigns mounted and associated publicity to deal with such a pandemic. Unfortunately, the clear identification

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History

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of the inactivity pandemic in Lancet barely generated any media response.

Contributors to overall health status

Four basic factors contribute to a person's overall health status [3]. The first is genetics, which contributes approximately 20%. Clearly selecting the right set of parents can give you a big leg up on a long and healthy life. The second factor is environment, which also contributes approximately 20%. It is obvious that living in an environment that exposes a person to poor food or water, to infectious diseases, or to other toxins can impact health status in a negative way. The third factor is access to health care, which accounts for only about 10% of a person's overall health status; it's certainly shocking to consider that with all the money spent on health care, it accounts for roughly 50% of a person's overall health status. How can we hope to impact health without dedicating significant resources toward modifying the factor that is most easily changed?

If we look closely at which behaviors correlate with overall health status, it is clear that the top 3 are exercise, smoking, and diet. From a public health standpoint, there has been considerable effort around the issues of smoking and obesity. It is a well-established standard of care that physicians ask patients about their smoking habits and counsel smokers to quit, which often entails referrals to smoking cessation programs funded by insurance. In addition, it is also a generally accepted standard of care to measure height and weight on all patients to determine their body mass index, so that overweight or obese patients can be appropriately counseled on the importance of proper diet and losing weight. Registered dietitians are an integral part of the health care team, and they help patients lose weight by advising on a proper diet.

In contrast, very little effort has been put toward increasing public awareness about the dangers of physical inactivity and counseling inactive patients to start exercising. Why isn't exercise assessed at every office visit as a standard of care, just as smoking and body mass index are assessed? Why is the fitness industry completely separate from the health care industry? Why can't I refer my sedentary patients to a fitness professional who can help them become more active? This does not make sense, given the well-established health hazards associated with physical inactivity. Considering that insurance will pay for bariatric surgery to help an obese patient lose weight, it seems logical to pay for a fitness professional to help a sedentary patient become more active. Numerous studies suggest that the health risks of inactivity are higher than those of obesity [1]. It is time we connect the fitness industry with the health care industry!

Exercise and health

Years of research have provided irrefutable evidence for the benefit of exercise in the primary and secondary prevention of diabetes, cancer (especially of the breast and colon), hypertension, depression, osteoporosis, dementia, and coronary artery disease. In addition, regular exercises has also been shown to dramatically lower all-cause mortality rates and especially cardiovascular-related mortality [4]. Beyond all this, exercise has also been shown to significantly mitigate the harmful health effects of obesity. In fact, studies have shown that patients are better off being fit and fat than skinny and unfit [5]. That means a low level of fitness is a bigger risk factor for mortality than mild to moderate levels of obesity. The important message for all patients to understand is that the benefits of physical activity are the same regardless of how much you weigh.

Beyond the health benefits mentioned above, regular physical activity has been shown to significantly improve quality of life. Patients who maintain an active way of life are able to maintain a high functional capacity for much of their life. This is in direct contrast to those who are inactive, who often and predictably begin to suffer prematurely from chronic diseases, which significantly impacts their functional capacity. Because of this, these patients often enter into a stage that we could call "deficient survival [6]." These are patients who are alive but not really living because their functional capacity is so low. They represent a tremendous burden to society, both for medical coverage and for disability payments. Their ability to live a normal life and do the things they want to do is often severely limited because the premature development of chronic diseases associated with an inactive lifestyle have impaired their functional capacity.

In addition, we also know that health care costs are significantly impacted by physical activity levels. Studies show that active patients cost significantly less to care for than inactive ones. One study found that active patients had almost 30% lower health care costs than those who were inactive [7]. It is hard to think of any disease that is not significantly improved by regular physical activity, and studies abound showing tremendous cost savings associated with encouraging patients to become more active [8].

Exercise is medicine

Based on the extensive evidence reviewed above, it is clear that exercise is like a medicine. It is the long-sought-after drug needed to prevent chronic disease and extend life. Could you imagine if we had a pill that had even a fraction of the positive healthy benefits of physical activity? It would be the most widely prescribed medication in the world, and not prescribing it would likely be considered malpractice.

So why has the medical community neglected exercise as a standard treatment? The answer to that question is quite complex, but I suspect it's just easier for most physicians to prescribe a pill to reduce blood pressure, cholesterol, glucose, or even body mass index, rather than counsel patients on getting more active. The other issue is the lack of reimbursement for exercise counseling and most other preventive measures. However, it is clear that this focus on pills is flawed, because we know that medication adherence is very low [9]. In addition, a reliance on pills seems to transfer responsibility for health away from the patient and onto the physician. In many cases patients seem to be less active and eat more poorly when prescribed medications [10].

There is also a widespread belief that we cannot change the physical activity habits of our patients, and this notion was reinforced with a statement issued by the United States Preventive Services Task Force that there is no strong evidence to suggest that physicians prescribing exercise actually leads to patients exercising more. However, this is a relatively new and underfunded area of research, and there is good evidence that even brief counseling and endeavors such as pedometer programs can significantly increase levels of physical activity among patients [11]. But think about it: if we are able to convince patients to take insulin shots or blood thinners or chemotherapy, why would we not be able to convince them to exercise? As long as organized medicine continues to avoid responsibility for promoting physical activity to patients, it is unlikely we will see a slowing in the rise of noncommunicable diseases that are so closely linked to an inactive lifestyle.

The exercise is medicine initiative

It was for the above reasons that the Exercises Is Medicine (EIM) initiative was established. The stated goal of the EIM initiative is "to make physical activity assessment and exercise prescription a standard part of the disease prevention and treatment paradigm for all patients [12]." This initiative was started by the American College of Sports Medicine in conjunction with the American Medical Association in November 2007. A national launch was held in Washington, DC, that was attended by then US Surgeon General Dr. Steven Galson,

along with the directors of the President's Council on Physical Fitness and Sports and the California Governor's Council on Physical Fitness and Sports.

In May 2008 the first World Congress on Exercise Is Medicine was held in conjunction with the American College of Sports Medicine's annual meeting to announce the global launch of this program. Since that time, EIM has spread to over 40 countries with 7 regional centers in North America, Europe, Latin America, Asia, Africa, China and Australia. It has been interesting to note the worldwide acceptance of the basic tenets of EIM, including recommendations for weekly physical activity to improve health. Most countries have established physical activity guidelines that are essentially the same, suggesting that adults should get 150 minutes or more moderate to vigorous activity each week. It is amazing to have a major public health problem in which almost everyone worldwide agrees on the proper treatment!

A sports medicine approach

It is clear that the intersection of physical activity and health falls closest to the specialty of sports and exercise medicine. For this reason, it makes sense that sports and exercise medicine physicians and scientists should lead the effort in promoting physical activity among patients [13]. Sports medicine practitioners have expertise in helping patients begin, maintain, or increase physical activity. It is also clear that these practitioners can have their greatest impact on the health of patients by promoting exercise.

I personally have found that a sports medicine approach works quite well with most patients, and I would suggest that physicians consider all patients as athletes. In doing so they should look at every physical exam as a pre-participation exam, with an end goal of clearing patients for the regular physical activity needed to stay healthy. In this case, rather than clearing patients to participate in sports, they are clearing them to participate in regular exercise. In addition, they should consider exercise an essential part of the treatment for all patients with an injury or illness by helping them return to their regular exercise routine. By looking at each patient like you would an athlete, you can be much more effective in helping him or her return to the physical activity needed to stay healthy.

The exercise vital sign

One of the basic tenets of EIM is that physical activity should be regarded as a vital sign. It is suggested that all patients should have their exercise habits assessed and a proper physical activity or exercise prescription administered. The exercise vital sign (EVS) is a simple way to do this and also to introduce the topic of exercise into the exam room with every patient [14].

Kaiser Permanente has effectively used an EVS in their Southern California Region beginning in October 2009, and since that time it has also been rolled out to all the other Kaiser regions. The EVS at Kaiser is administered by medical assistants as part of their routine assessment of traditional vital signs of blood pressure, pulse, respiration, and temperature. To assess the EVS, each patient is asked 2 simple questions. The first question is, "On average how many days per week do you engage in moderate to vigorous physical activity like a brisk walk?" The medical assistant then records the patient's response by clicking a box from 0 to 7 days corresponding to the answer. The second question is, "On those days, how many minutes do you engage in physical activity at this level?" The medical assistant then records the answer, indicating 10, 20, 30, 40, 50 minutes, and so on. The computer then multiplies the 2 responses together to calculate the minutes per week of self-reported moderate to vigorous exercise. The Kaiser electronic medical record then automatically displays the minutes per week of moderate to vigorous physical activity (MVPA) that patient reports they typically engage in. Adults doing less than 150 minutes per week of MVPA are then flagged with an alert that they should be counseled to be more active.

The Kaiser Permanente EVS has gained remarkable acceptance in the 5 years that it is been used in Southern California, and currently well over 90% of adult patients have an EVS recorded on their chart. More importantly, when we look at patients over 65 years, we find that 96% have an EVS on their chart. This is the age group that can most benefit from doing regular exercise.

We have also found that like other populations studied, Kaiser patients are often not meeting US physical activity guidelines. In fact our data showed that 36% of patients report they are completely sedentary and are doing no physical activity in a typical week. We also found that 33% were insufficiently active, reporting they typically engage in between 10 and 149 minutes per week of MVPA. Further, we found that only 31% of patients are currently meeting the US physical activity guidelines of at least 150 minutes per week of MVPA [15].

The role of the physician

What can busy physicians do during an office visit to encourage physical activity in a patient? If they are running late and the patient has multiple other concerns or issues, it is reasonable on that visit to skip discussions about increasing physical activity. At least the EVS was administered by the medical assistant, so the patient had some exposure to the idea that physical activity is important to one's health.

However, if the physician has less than a minute to offer advice, I recommend that they do 1 of 2 things:

- 1. Congratulate patients who are getting 150 minutes of MVPA by saying, "Great job! You are getting the exercise you need to be healthy. Keep it up!"
- 2. Encourage patients who are doing less than 150 minutes per week to try to become more active, such as by saying, "I noticed that today your blood pressure is high and you report doing no physical activity. There is likely a connection there, and before I put you on medication, why don't you try to walk 30 minutes on 5 or more days each week and let's follow up to see if that lowers your blood pressure before we start medication."

If the physician has a couple of extra minutes to counsel patients on their physical activity, I recommend they review some key messages about the importance of physical activity to health, particularly with regard to conditions or concerns that patient may have. The physician may offer a generic exercise prescription based on the FITT mnemonic (discussed below), or suggest useful resources such as getting a pedometer to measure walking steps (with a daily goal of 8000 to 10 000 steps), or talking to a wellness coach or perhaps an exercise class or DVD. One might also consider connecting the patient with community resources such as a YMCA or a local fitness professional.

If the physician has 5 minutes for counseling, it may be appropriate to assess the patient's readiness for change regarding exercise. The physician might ask what the patient would want to do to be more active and what barriers are preventing this from happening. Brainstorming on how to get around these barriers may be quite helpful to patients in need of increasing their physical activity. It would also be helpful to explain to patients in detail how exercise can affect the diseases that they have or that they may be at risk for, and how they can go about incorporating physical activity into their daily life.

The exercise prescription

The simplest way to administer an exercise prescription in a busy clinical setting is by using the FITT pneumonic. "F" stands for frequency, and the ideal frequency of exercise is most days of the week (5 or more). "I" stands for intensity, and the recommended intensity of exercise is at the moderate level, which can be gauged by a heart rate that is roughly 50% to 70% of maximum. Maximum heart rate can be estimated by subtracting the patient's age from 220. So then a moderate level of exercise would be that which elevates the heart rate to roughly 50% to 70% of the predicted maximal heart rate. A much simpler way to estimate intensity of exercise is by using the "sing-talk" test [16]. During moderate exercise, a patient would not be able to sing, but should be able to talk. Moderate exercise should not be exceedingly uncomfortable for a patient to engage in. The first "T" stands for type of exercise, although the type is not too important, just as long as the exercise works large muscle groups and is something that the patient enjoys and is likely to do over and over again. The second "T" stands for time, and the time spent exercising should be 30 minutes. So a simple exercise prescription would be to advise the patient to walk 30 minutes at a brisk pace on 5 days each week. In most instances, walking is the default exercise prescription.

Common barriers to exercise

Very often patients relate a variety of barriers that prevent them from doing the exercise they need to be healthy. The most common barrier is a lack of time due to competing demands. Patients often describe having a job that requires them to work long hours, often with a long commute, which leaves them with little time to exercise. In addition, responsibilities to their children and spouse place further demands on their time. Such competing demands often leave the patient too tired and without the time needed to do regular physical activity. Additionally, patients may complain about a physical limitation that prevents them from doing regular exercise, such as lower extremity arthritis or perhaps severe medical conditions that may put limitations on exercise capacity or may simply make it impossible to do. Patients may also say that exercise is simply too boring and that they don't enjoy it. In the end, patients often develop sedentary habits and a lifestyle that includes very little physical activity.

An important job for the physician is to help break down these barriers to exercise and to counsel patients to make exercise a habit and not an option. Patients should understand that although 150 minutes per week of MVPA is the goal, it does not have to be the starting point. I think it's important for patients to start off slowly, perhaps doing 1 to 2 days a week and gradually trying to increase it. Studies show that doing three 10-minute bouts of exercise works just as well to benefit health as doing 30 minutes of sustained exercise on any given day [17]. It is clear there is no amount of exercise that does not have an impact on health, and patients should take every opportunity they have to engage in physical activity, such as parking their car further away or taking the stairs rather than the elevator, which can add up and make a difference to their health.

I have found that a simple recipe for getting patients to exercise is the following: I advise patients to park their car in the morning further away from their workplace, or other destination, and then take a brisk 10-minute walk to their workplace. At lunchtime they should walk out and back 5 minutes each way prior to eating. Then when the workday ends, they are taking the same 10-minute walk back to their car. In this way they have achieved their 30-minute goal for the day, and if they do this on all 5 weekdays, they will have accomplished their 150 minutes of moderate or greater exercise that is recommended, and they can then take the weekends off.

If they simply cannot get their exercise done during the week, they can certainly choose the option to do it all on the weekends. These patients should consider changing their mindset for the weekend from a time to rest to one of fitness activities. Studies suggest that if they want to do 75 minutes of moderate exercise on Saturday and another 75 minutes on Sunday, they can get their 150 minutes per week of exercise done all on the weekend with a similar benefit to health [17].

Another way to help patients who lack time is to bump up the intensity of the exercise that they do. Studies suggest 25 minutes of vigorous exercise like jogging done 3 times per week is equivalent to doing 30 minutes of moderate exercise like a brisk walk done 5 times per week [17]. It is clear that by bumping up the intensity of exercise you can get a similar benefit in half the time.

Other ideas that can be helpful for patients trying to get more exercise include finding an exercise partner. Having someone who holds the patient accountable and shows up each day to do exercise can be very beneficial for encouraging patients to get the activity they need. In addition, owning a dog has also been shown to be a very helpful way to get exercise. Studies have found that patients who own dogs tend to walk more [18]. I also like to encourage patients to invest in their exercise habits. They should consider buying a good pair of shoes that fit well and workout clothes that are comfortable. In addition, I have found that setting goals or having an event on the calendar can be quite helpful to promoting exercise. It is likely that if patients sign up to do a fun run or walk or perhaps even a sprint triathlon, they are more likely to get the exercise they need in order to prepare for such an event.

The power of walking

Walking should be considered the default exercise prescription for many reasons. Most importantly, walking is extremely accessible for all ages and fitness level abilities, and can be done alone or in groups in almost any setting. Also, walking is low-cost and doesn't require a gym or specialized equipment. It is also easy to measure walking by using a pedometer or a stopwatch, or by marking off a specific distance. Walking is the most common form of adult activity and has generally good long-term adherence. It is a proven form of exercise, with multiple studies showing its benefits to health. Finally, walking is cost-saving in terms of lower health care costs and fossil fuel consumption. For that reason it is also helpful to the environment and can be considered a very "green" endeavor.

Walking in hospital patients

Studies show that hospital patients who walk during their stay have significantly fewer complications and shorter lengths of stay [18,19]. Strategies to prevent virtually every common hospital-related complication include increasing walking during a patient's hospital stay as a key factor. For this reason we have begun using an activity monitor at Kaiser Permanente to measure the number of steps and minutes walked in our hospital patients.

We record the number of minutes and steps a patient walks by using a small activity monitor that is attached to each hospital patient's ankle. These measures are uploaded to the patient's chart and recorded as an inpatient EVS. This information is then displayed each morning on the hospital room message board, including the number of minutes each patient walked and the number of steps taken during the previous 24 hours. Patient's walking data are then discussed with the patient, the family, the nursing staff, and the physician caring for the patient to help encourage and motivate each hospital patient to walk as much as possible. Patients who are not walking will be encouraged and helped to get out of bed and walk to reduce hospital-related complications and length of stay. This is yet another example of the power of walking to improve health.

Conclusion

The evidence is clear that exercise is a very powerful tool to treat and prevent chronic disease, to mitigate the harmful effects of obesity, and to lower mortality rates. In addition, exercise also has a powerful effect on functional capacity and quality of life. In effect, exercise is medicine, and many experts consider physical inactivity to be the major public health problem of our time. For these reasons, physicians have a responsibility to assess physical activity habits in their patients, inform them of the risk of being inactive, and provide a proper exercise prescription. The easiest way to do this is by using an EVS to assess the minutes per week of MVPA each patient is doing. Based on the EVS, the physician may either congratulate patients on meeting current physical activity guidelines of 150 minutes or more MVPA each week, or encourage inactive patients to try and meet these guidelines. Typically walking is considered to be the default exercise prescription, although the type of exercise patients engage in is not so important. Sports and exercise medicine professionals have the training and background necessary to lead the effort to promote exercise as a medicine and connect fitness with health care.

Declaration of interest

The author reports no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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