

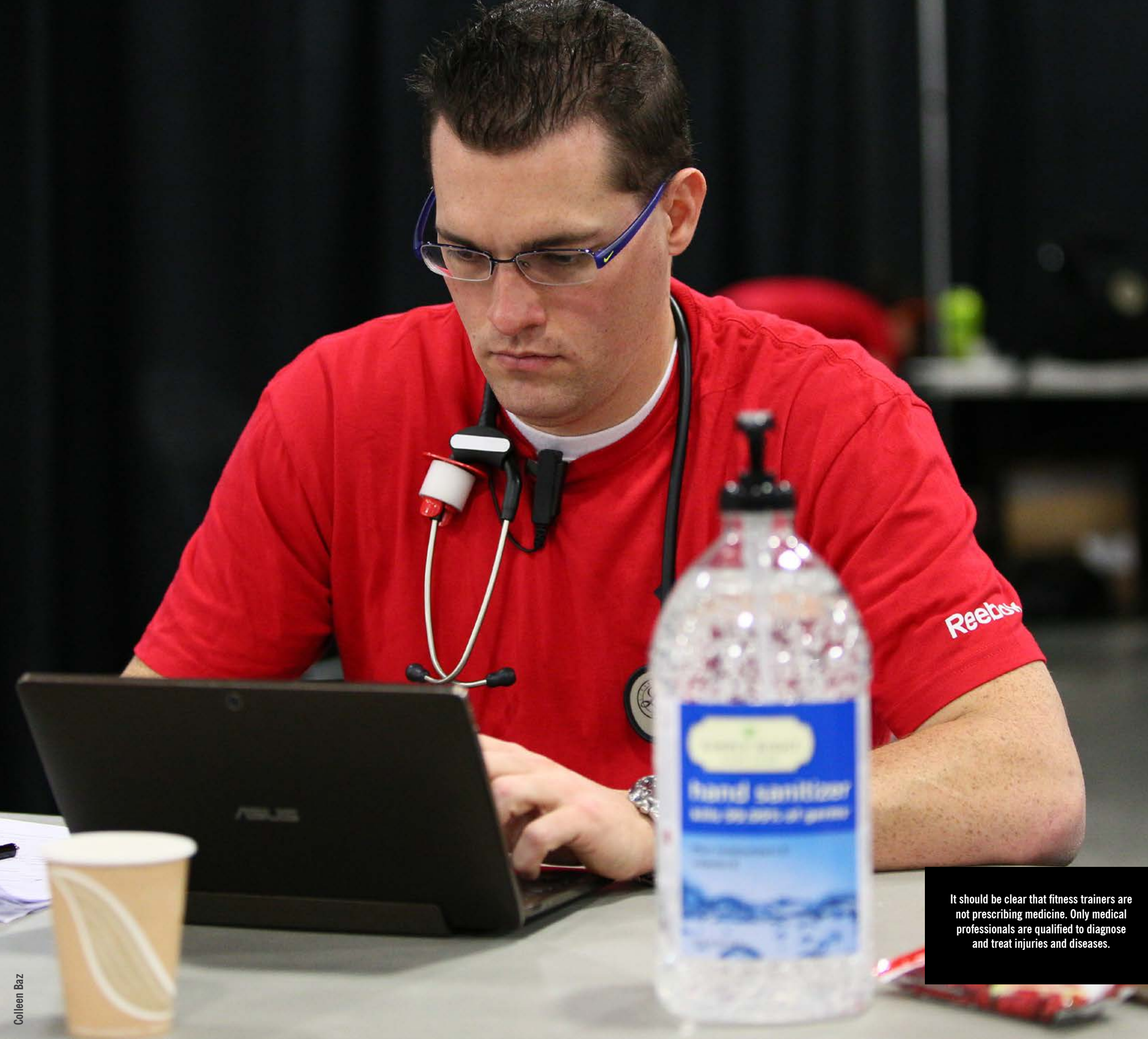
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EXERCISE IS MEDICINE: IMPRECISION AND IMPRACTICALITY

Exercise is not medicine, and suggestions to the contrary do nothing to help fitness trainers improve the health of their clients.

BY LON KILGORE





It should be clear that fitness trainers are not prescribing medicine. Only medical professionals are qualified to diagnose and treat injuries and diseases.

“An apple a day keeps the doctor away.”

“Milk: It does a body good.”

These popular sayings portray certain activities as having the ability to improve health. Most people accord a notion of truth to the adages, but would anyone suggest a farmer or retailer could be held out as an exemplar of a health or medical profession?

Probably not.

Yet this is exactly what the American College of Sports Medicine (ACSM) is trying to do with Exercise Is Medicine (EIM)—a media campaign, a proposed system of physician-based physical-activity prescription and referral, and a revenue-generating set of credentials offered by the ACSM.

EIM is a multi-organizational global initiative first launched in 2007 by the ACSM. As described by its other founding partner, [The Coca Cola Co.](#), EIM is designed to promote physical activity and make it a “vital sign” that is routinely assessed at every patient interaction with a health care provider. EIM provides materials and training to help health professionals motivate patients and the public-at-large to get moving and improve their health.”

The logic of EIM seems sound: Get physicians to perform fitness screenings and physical-activity behavior assessments as part of every patient visit, then motivate the patient to become physically active for a health benefit.

However, an easily evident practical problem must be overcome: The average physician visit is 15.7 minutes in duration in the United States. During a visit, five topics are generally discussed, with the longest period of discussion about five minutes for major issues and about one minute for minor issues (9). Given the extent of the physician’s list of tasks recommended by EIM in its “[Healthcare Providers’ Action Guide](#),” discussion of physical activity would require at least five additional minutes.

Assuming physicians maintain their current average work week of 51 hours, the additional time spent with each patient would reduce the number of patients who could flow through a physician’s office from approximately 89 per week at present to about 66.

Even if physical activity was treated as a minor topic and only one additional minute was spent on counseling, the weekly flow through the physician's office would drop to about 82 patients.

Regardless of its potential effect on availability of timely medical care, EIM should demonstrate efficacy if it has any value at all.

Most current research documents evaluating cost effectiveness of physical-activity interventions report their findings in the context of “quality-adjusted life years” (QALY)—an estimation of how something affects quality of life. QALY for a healthy year is 1.0. A diseased year has a fractional value (less than 1.0). Researchers use the QALY value in a formula to estimate the potential cost savings of a treatment (compared to no treatment) over the life of an individual. When physical-activity interventions are presented to the government or to the public, it's generally suggested tens of thousands of dollars could be saved over a lifespan if an individual becomes physically active. But we need to look beyond the statistical modeling of hypothetical circumstances and consider the real world.

In “Disease Control Priorities in Developing Countries,” a chapter is spent reviewing relevant research on interventions for musculoskeletal conditions. Physical activity—as it is currently theorized to be delivered in interventions—is not considered cost-effective in developed countries, and the weight of support demonstrating any effectiveness was specifically described as “currently meager” (2). This position seems at odds with what the ACSM argues is accepted convention, and we should therefore question convention.

EIM proposes that ACSM-certified clinical-exercise physiologists or those with the EIM certification will be chosen to deliver interventions intended to get members of the public active for health and financial benefit. But no one remembers that every intervention requires money—up-front money.

A number of other issues are similarly neglected. Who identifies those in need of intervention? Where are the interventions delivered? Who arranges the interventions? What equipment and supplies are used? What labor is used and who provides it? How much does all that cost? And who pays?

Who Prescribes and Who Implements?

The answers to these questions are widely variable in research literature, but the EIM model would suggest that physicians are the source of prescription or referral (see above right).

EXERCISE PRESCRIPTION & REFERRAL FORM



PATIENT'S NAME: _____ DOB: _____ DATE: _____
 HEALTH CARE PROVIDER'S NAME: _____ SIGNATURE: _____

PHYSICAL ACTIVITY RECOMMENDATIONS

Type of physical activity:	Aerobic	Strength
Number of days per week:		
Minutes per day:		
Total minutes per week*:		

*PHYSICAL ACTIVITY GUIDELINES

Adults aged 18-64 with no chronic conditions: Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day, five days a week) *and* muscle-strengthening activities on two or more days a week ([2008 Physical Activity Guidelines for Americans](http://www.acsm.org/physicalactivity)). For more information, visit www.acsm.org/physicalactivity.

REFERRAL TO HEALTH & FITNESS PROFESSIONAL

Name: _____
 Phone: _____
 Address: _____

 Web Site: _____
 Follow-up Appointment Date: _____
 Notes: _____

In the Exercise Is Medicine model, it's likely this form would be completed by a physician.

15 minutes d'activité physique = 1 cube énergie



In Canada, the Quebec Federation of General Practitioners model features prescribed 15-minute “cubes” of activity.

These prescriptions or referrals can be for home exercise or a simple behavior-modification protocol similar to quit-smoking programs. It's remotely possible physicians will refer to a fitness facility with clinically qualified staff. Note that referral to a fitness trainer is in no way guaranteed.

A physician-generated prescription within the EIM system will most likely be a simple re-statement of ACSM recommendations (provided for reference at the bottom of the EIM form) written into the form by a physician, nurse or office assistant; the patient is to implement on his or her own at home.

Another example of physician prescription can be found in the Quebec Federation of General Practitioners initiative to prescribe 15-minute “cubes” of activity to patients. This example is clearly intended to promote home or workday physical activity, not exercise, as the walking-shoe graphic on the prescription sheet suggests.

It really needs to be understood that telling someone to go do something for X minutes Y days per week does not constitute a responsible prescription. Would any physician tell a patient to pick any dose of any medication as long as it's above a low threshold that might or might not provide benefit?

Regardless, the ACSM is positioning itself to benefit from potential referrals to external obesity and physical-activity counselors and providers. It provides physicians with an information package that promotes referrals to degreed individuals with ACSM/EIM credentials in hopes of establishing a flow of clients from physicians to a specific group of practitioners with ACSM/EIM credentials. This can be seen in the guidance offered to physicians in the EIM package. The “Questions to Ask an Exercise Professional” section in the “Healthcare Providers’ Action Guide” includes the following:

- “Do they hold a 4-year degree from an accredited university in Exercise Science, Kinesiology, Exercise Physiology, or a related health and fitness field?”
- “Do they have additional training and certification by a nationally-recognized organization?”

In addition: “To ensure that the health fitness professionals in your network are trustworthy, EIM has developed a credential program that will provide health fitness professionals with an additional skill set that will allow them to work closely with the medical community (such as your clinic) and receive patient referrals.”

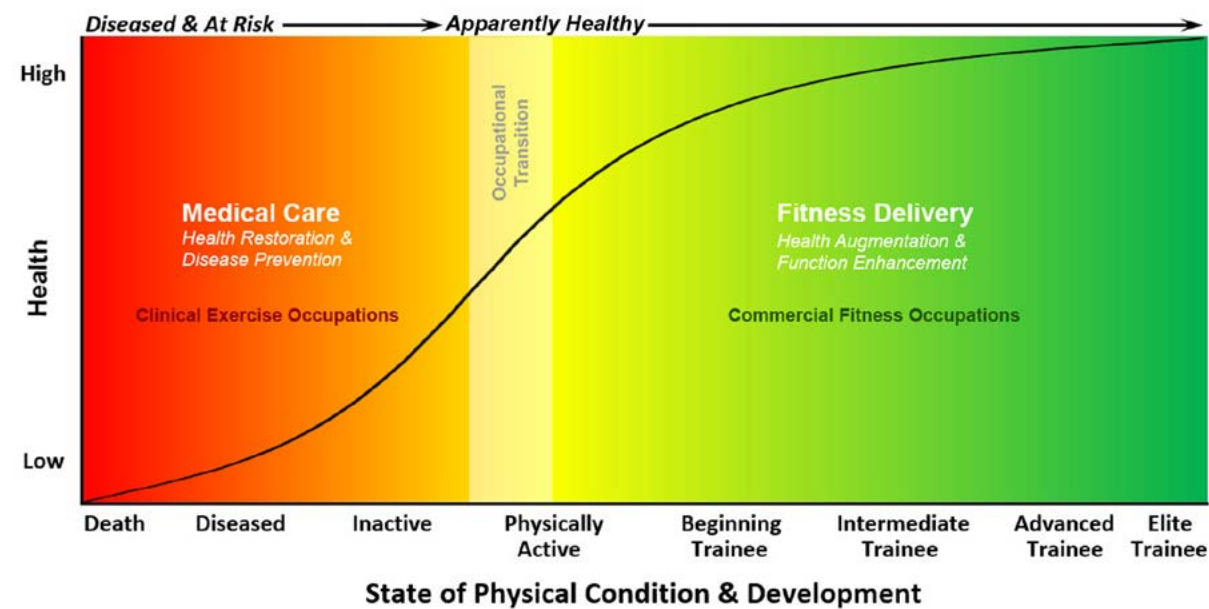


Figure 1—Clinical exercise, as framed within the ACSM and EIM proposals, can be considered medical health care only for those who are diseased and those inactive individuals with risk factors for cardiovascular and metabolic disease (red side). Anyone who is without disease or risk factors (apparently healthy) benefits most directly from the delivery of commercial fitness-training services (green side). It is important to note that a large improvement in health status occurs when one simply becomes physically active.

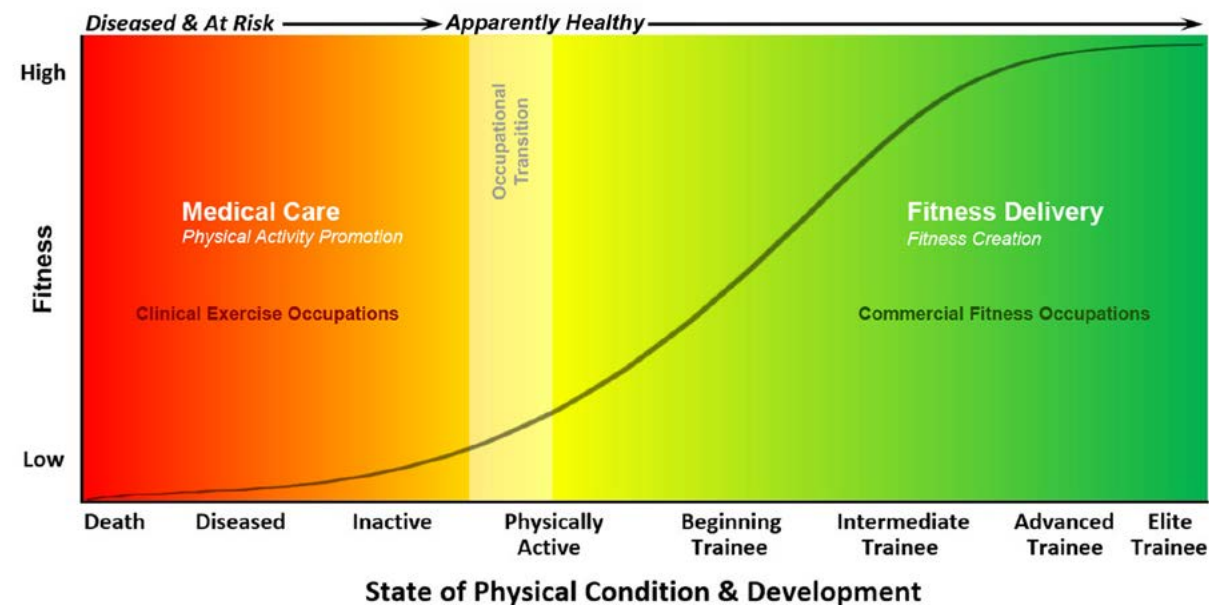


Figure 2—Clinical-exercise occupations are not intended to and do not create optimal fitness. They are concerned most with reaping health benefits through promotion of physical activity in diseased and sedentary populations. The majority of fitness development occurs outside clinical environments.

Money Matters

Cost and payer are somewhat known.

Several but not all papers have reported the direct costs of intervention, with costs ranging from a few hundred dollars up to thousands—\$435 (5) to \$5,308 (6). Results are not guaranteed to be stellar: In one paper (8), the average cost of intervention per patient was \$2,359; when calculated, each kilogram (2.2 lb.) of weight loss cost \$2,040 and every millimeter of mercury drop in blood pressure cost \$574.

So we are led to believe that if we spend somewhere between \$435 and \$5,308 we can save maybe \$20,000 in health-related expenditures over an individual's lifetime (the QALY value). This too-good-to-be-true projection sounds much like an appliance salesman's upsell attempt: "Buy this model of washing machine and you'll actually save on your electric bill over the life of the machine. It will pay for itself."

But where does the money for these interventions come from? Most of the interventions researched were funded by scientific and medical grants. But if these interventions were to be implemented on a large scale, the money would either be allocated as a government-funded initiative or become a reimbursable expense through an insurance instrument. In either case, the individual—as a taxpayer or insurance subscriber—will pay for the intervention. It will not be free.

Let's do a few calculations using a cost of intervention of \$1,134 per person (3).

Most literature would suggest that anyone who is sedentary or overweight/obese would be targeted, creating a large pool of participants. It has also been suggested that EIM interventions should be provided to the entire population. With the latter premise, we're no longer dealing with medicine, because no physician would prescribe medication or therapy for a healthy (disease- or injury-free) person. For exercise to be medicine it must be delivered to diseased individuals as illustrated in the figures to the left—but remember "exercise" in Exercise Is Medicine actually refers to "physical activity."

In the United States, that would qualify 66 percent of the population for an intervention, according to [overweight/obesity status](#). In the U.K., about 62 percent of the adult population is considered [overweight/obese](#).

This means about 212 million Americans and 40 million British would be referred to interventions if EIM recommendations were adopted. The actual cost of providing an intervention to each person would be staggering:

U.S.—212 million x \$1,134 = \$240,408,000,000

U.K.—40 million x \$1,134 = \$45,360,000,000

That's right: \$240 billion and \$45 billion, respectively. In the U.S., the entire Department of Transportation receives just over 35 percent of that amount ([\\$84 billion](#)) to maintain the nation's transit infrastructure. The U.K. spends about 40 percent ([\\$19 billion](#)) on transportation.

It's hard to fathom, but EIM recommendations could require commitment of 1.4 percent of the \$17 trillion U.S. GDP and 1.5 percent of the \$3 trillion U.K. GDP to obesity and physical-activity counseling or intervention if the initiative were supported by taxes.

Of course, no government or private system could deliver 212 million or even 40 million behavior-modification instances in a single year. These numbers would require long-term investment of funds and labor—and far more than EIM's creators would like to acknowledge.

At this point, we must ask how long it will take for interventions to have an effect.

A Multi-Generational Model

Aside from the monetary problem, physical-activity behavior interventions are only partially successful in actually creating long-term change. It cannot be assumed that the individual will act on the information delivered or continue with the guided physical activity for life.

In fact, the dropout rate for physical-activity interventions is quite high. Getting people to adopt better behaviors is problematic during intervention delivery and becomes even harder and less effective in the months and years after an intervention. A 75 percent dropout rate within the first 42 days has been reported (4). The research in the area is riddled with studies that report high attrition rates (as above) or report lower rates of attrition around 14 percent (1). Regardless of how many fail to remain physically active post-intervention, we know that a 100 percent success rate is impossible.

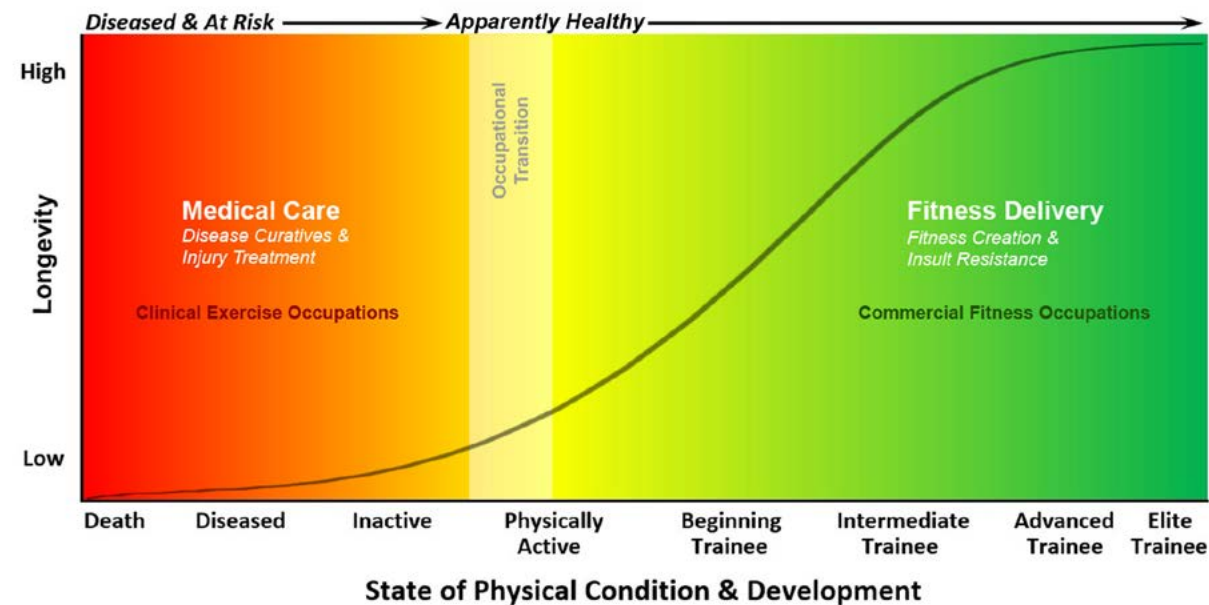


Figure 3—Survival rate or longevity is affected by fitness. Clinical-exercise occupations, as part of the medical community, aid in the diagnosis, treatment, and cure of disease and injury. This significantly increases longevity. Higher levels of fitness, as delivered by the commercial-fitness industry, also significantly improve longevity: Those in the upper quartiles of endurance and upper two-thirds of strength reap a stepwise increase in lifespan.

If, for example, the EIM intervention successfully converted about 30 percent of the subjects who passed through the system, we would only achieve about 30 percent of the associated QALY benefits. The costs of the 70 percent who dropped out would then be applied to the 30 percent who were compliant over the long term, thus significantly reducing the overall economic and social benefits.

If we repeat the intervention on those who drop out, recidivism would require the dropouts to remain in the program longer and thus increase the direct costs. Simplistically calculated, it would take approximately 18 intervention cycles to convert about 90 percent of the population—if simple repetition was effective.

If the first repetition cost \$252 billion in the U.S. and \$40 billion in the U.K., how much would 17 more cycles cost? In the U.S. it could create a total cost of about \$838 billion; in the U.K. it would cost \$133 billion. Combined, that's almost \$1 trillion.

And how long will it take? If there is a 70 percent failure rate for an intervention, and if that rate stays constant with every repetition, then over 700 million individual interventions will need to be delivered in the U.S. to reach an approximate 90 percent overall compliance status. Keep in mind repeat interventions do not guarantee success with reluctant populations.

As of 2014, the U.S. was home to 6,600 exercise physiologists—the individuals the ACSM and EIM propose to deliver interventions. If an intervention requires 10 hours of labor per individual over a 20-week intervention, then about 7 trillion labor hours would be required to deliver all 18 cycles needed to achieve about 90 percent compliance. That means the 6,600 exercise physiologists currently working would each need to put in over 1 million hours of work time to deliver that volume of interventions. A 40-hour work week 50 weeks a year would require each of the 6,600 exercise physiologists to work exclusively on intervention delivery for 534 years—about 21 generations.

Even if these calculations overestimate costs and time and were found to be off by a factor of 10, the fact remains that EIM-proposed intervention is not financially or operationally tenable.

Efficacy?

Some readers may view this article as a hatchet job intended to discredit the hard work of researchers. It's not. We learn from failures. We learned much from the failures of Healthy People 2000 and Healthy People 2010 in achieving their physical-activity goals, and we should welcome new, innovative ideas and research on the topic.

However, a rather dire indictment of the potential failure of the EIM model comes from within the program (7). Dr. Felipe Lobelo was quite pointed when describing the state of knowledge regarding such interventions in a 2015 presentation to the ACSM: “We don't have concrete data yet showing that we can help save money by improving fitness or improving steps or activity levels.” He further stated that in some instances the actual engagement of targeted individuals with interventions can be abysmally low, providing an example where only 4 percent of the individuals offered a free fitness-center membership as part of an intervention actually engaged and improved their health status (7). If this 4 percent success rate were seen with EIM, 96 percent of the funds expended would return no medical, social or functional benefit.

These observations are reflected in the U.S. Department of Health and Human Services document “Strategies to Prevent Weight Gain Among Adults,” in which it was determined:

- “The strength of evidence is not high for any of the tested interventions or the approaches described in observational studies to prevent weight gain as measured by changes in BMI, weight, or waist circumference.”
- “When adherence was reported, it tended to be poor, with less than 80 percent adherence to interventions.”
- “Very few studies reported on obesity-related clinical outcomes (mortality, quality of life, or cancer recurrence) or adverse effects. All evidence for these outcomes was graded as low or insufficient.”

If data to demonstrate the financial viability, broad participant behavior change and outcome value of the EIM-proposed system is nonexistent, how can a responsible organization justify the EIM stance and propose to add a significant—and quite possibly unaffordable—financial burden to the general population? Ethics aside, the ACSM—with support funds from Coca-Cola—is lobbying the U.S. Preventive Services Task Force (USPSTF) to do just that.

The task force works to improve health “by making evidence-based recommendations about clinical preventive services such as screenings, counseling services, and preventive medications,” according to its website. Currently, the task force rates general physical-counseling activity a C. The ACSM, via EIM, is bent on convincing the task force to upgrade that rating to a B. If that occurs, then by virtue of the tenets of the Affordable Care Act, insurance companies would be required to cover physical-activity counseling.

This adds an additional billable service for a physician's office at the expense of adding more paperwork and draining physician time from treating disease and injury. Of note, an upgrade to a B rating does not create an insurance-billable line of services for anyone who delivers training in gyms, recreation facilities, spas, clubs or sports, so most trainers would not be served by any changes.

So What Now?

The fitness industry is not medicine. Any organization that argues fitness is medicine is overreaching its operational scope and pandering to its members and the populace, all in hopes of weaseling into a place alongside medicine, nursing, physical therapy and athletic training as a licensed profession. Organizations within the commercial fitness industry—including nonprofit businesses such as the American Council on Exercise and the National Exercise Trainers Association—need to understand that EIM is not relevant to their scope of practice, nor does the ACSM-driven initiative benefit the trainers they serve unless those trainers are also ACSM/EIM credentialed.

The ACSM must be encouraged to cease its attempts to confuse and misclassify fitness delivery to healthy individuals as medicinal physical activity in order to advance its own agenda at the expense of its partners, its competitors and fitness trainers everywhere. Although fundamentally different, physical activity and exercise can indeed be medicine—but only if disease or injury is present.

In 1954, when it broke from the American Association for Health, Physical Education, Recreation & Dance, the ACSM chose to abandon the teaching and delivery of fitness as an organizational mission in favor of being an organization dedicated to science and medicine. And that is precisely where it should focus current efforts: The ACSM should concern itself with physical activity and exercise as therapy for disease and as rehabilitation. It should leave fitness for the masses to others.

CrossFit Founder and CEO Greg Glassman has described exercise training as “non-medical health care that works.” In the context of the gym, this means trainers in the fitness industry aren't diagnosing or prescribing anything. They are teaching and training fitness, and the byproduct of their services is better health and function in their customers. In contrast to the outcome goals of the ACSM and EIM, these are outcomes CrossFit and the evolving fitness industry can deliver. ■

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About the Author

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According to the "Certified CrossFit Trainer Candidate Handbook," a trainer "recognizes the limitations of his or her own knowledge and skill set and refers clients to other healthcare professionals when appropriate."