

Exercise is Medicine: A Historical Perspective

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BERRYMAN, J.W. Exercise is medicine: a historical perspective. *Curr. Sports Med. Rep.*, Vol. 9, No. 4, pp. 00–00, 2010. *Much of the early information about exercise and medicine appeared in the ancient, medieval, and Renaissance medical literature in the context of the “six things nonnatural.” These were the things that were under everyone’s own control, directly influenced health, and became the central part of the new “physical education” movement in the early 19th century in the United States. They were known then as the “Laws of Health.” Until the early 1900s, “physical education” was dominated by physicians who specialized in health and exercise. However, physical education changed to a games and sports curriculum led by coaches who introduced competition and athletic achievement into the classroom. As that happened, physicians disappeared from the profession. Through the last half of the twentieth century, as exercise became more central to public health, the medical community began to view exercise as part of lifestyle, a concept embracing what was once called the “six things nonnatural.”*

INTRODUCTION

The belief that exercise could be considered medicine, or part of medicine, is not new. In fact, before mainstream Western medicine and healthcare became more focused on “sick care” at the beginning of the 20th century, a major part of a physician’s duties focused on the preservation and promotion of health and the prevention of disease. In this context, physicians emphasized the importance of exercise and diet, or what became known as regimen. This strong emphasis on health, rather than disease, dates back to the two most prominent physicians of the ancient world: Hippocrates (460–370 B.C.) and Galen (129–210 A.D.).

EXERCISE AND THE NONNATURAL TRADITION

It was Hippocrates who wrote two books on regimen and noted that “eating alone will not keep a man well; he must also take exercise. For food and exercise....work together to produce health (23). Galen, who borrowed much from

Hippocrates to arrive at his own significant contributions to medicine, structured his medical “theory” around the “naturals” (of, or with nature — physiology), the “nonnaturals” (things not innate — health), and the “contra-naturals” (against nature — pathology). Central to this theory was health and the uses and abuses of the “six things nonnatural:” 1) air, 2) food and drink (diet), 3) sleep and waking, 4) motion (exercise) and rest, 5) excretions and retentions, and 6) passions of the mind. If the nonnaturals were observed and practiced in moderation, health would be the result. But if not followed, performed in excess, or put into imbalance, disease or illness would result (3).

These six categories embraced all of the activities relating to health over which a person had control. Accordingly, along with some drugs and minor surgery, following the nonnaturals was critical therapy. Exercise then, as part of “motion and rest in the nonnatural tradition, was incorporated in much of the early regimen, hygiene (health), and preventive medicine literature, and to a lesser extent, the therapeutic literature, through the late 19th century. While exercise was a recommended treatment for a variety of ailments including gout, dyspepsia, and consumption, among others, the primary use of exercise was for prophylaxis (3).

The classical Western medical notion that one could improve one’s health through one’s own actions — for example, by eating right, breathing fresh air, and getting enough sleep and exercise — proved to be a powerful influence as medical theory developed beyond Galen’s influence over the centuries. Ancient medicine made it clear to physicians and laypeople alike that responsibility for disease and health was

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not the province of the gods and goddesses. Every person, either independently or in counsel with their physician, had the opportunity to attain and preserve health. When the Middle Ages gave way to the Renaissance, with its individualistic perspective and its recovery of classical humanistic ideals, this notion of personal responsibility for health acquired even greater attention, and it was understood generally that “we die by the way we live (6).

EXERCISE IN THE MEDICAL LITERATURE

Examples of a continuation of the nonnatural tradition and the necessity of exercise for good health abound in the medical literature. Spanish physician Christobal Mendez, who wrote the *Book of Bodily Exercise* in 1553 said, “The physician must organize his patient’s life and the things called unnatural, such as eating and drinking, evacuation and retention, sleep and vigil, movement and rest, and the passions of the soul and alteration of the air” (37). He further argued that “if we use exercise under the conditions which we will describe, it deserves lofty praise as a blessed medicine that must be kept in high esteem (37).

Although Galenism and the “humoral theory of medicine” were displaced by new ideas, particularly through the study of anatomy and physiology, the Greek principles of hygiene and regimen continued to flourish in 18th century Europe. For some physicians in the 1700s, though, such intervention tactics were practical alternatives to traditional therapies that employed bloodletting, blistering, and heavy dosing with compounds of mercury — or, “heroic” medicine, where the “cure” was often worse than the disease.

In London, in the early 1700s, physician Francis Fuller published *Medical Gymnastics: A Treatise Concerning the Power of Exercise*. In his most poignant discussion of the role of exercise as medicine, he stated:

“That the Use of Exercise does conduce very much of the Preservation of Health...is scarce disputed by any; but that it should prove Curative in some particular Distempers, and that too when scarce anything else will prevail, seems to obtain little Credit with most People, who tho’ they will give a Physician that hearing when he recommends the frequent use of Riding, or any other sort of Exercise; yet at the bottom look upon it as a forlorn method, and the Effect rather of his Inability to relieve ’em, than of his belief that there is any great matter in what he advises: Thus by a negligent Diffidence they deceive themselves and let slip the Golden Opportunities of recovering, by a diligent Struggle, what could not be procured by the Use of Medicine alone (20).

Similarly, in Scottish physician William Buchan’s highly popular *Domestic Medicine*, first published in 1769, he suggested that “of all the causes which conspire to render the life of man short and miserable, none have greater influence than the want of proper Exercise” (10). He also explained that “exercise alone would prevent many of those diseases which cannot be cured, and would remove others where medicine proves ineffectual” (10). Later that century in Paris, French physician Clement Tissot wrote *Medical and Surgical Gymnastics* in 1780. With the subtitle of *Essay on the Usefulness of Movement, or Different Exercises of the Body, and of Rest, in the*

Treatment of Disease, Tissot argued for the importance of both active and passive exercises as well as the centrality of exercise for rehabilitation after surgery (46).

In antebellum America, the “six things nonnatural” became known as the “Laws of Health and were put forward along with herbs and water cures as alternatives to the “heroic” healing practices of drugging, bleeding, and purging practiced by most traditionally trained physicians. Here, one of the earliest examples is New York physician Shadrach Ricketson’s *Means of Preserving Health and Preventing Diseases*, published in 1806. He noted that he often saw people “whose inclination, situation, or employment does not admit of exercise, soon become pale, feeble, and disordered” and warned that “idleness and luxury create more diseases than labour and industry” (42).

Prevention literature and hygiene instruction also were popular in American medical practice before 1860 because there still were not many known cures. It was an era when many laypeople and physicians alike had much faith in nature’s healing powers. In fact, the term “natural” was used in medical writing to signify a state of well being. And it is important to understand that the Greek “physis” meant “nature” or “natural” and was the root of “physick,” the term used for medicine into the 1700s and also for our more modern term “physician.” As such, improvements in public health measures, a reliance on and trusting of nature, and plans for educating the public on living habits all received attention in the medical literature.

THE NEW “PHYSICAL EDUCATION” PROFESSION

The “Laws of Health,” or the nonnatural tradition itself, found further expression in pre-Civil War America through a new literature and profession devoted to “physical education.” Physicians began using the term “physical education” in journal articles, speeches, and books to represent the task of teaching the “Laws of Health,” or instruction about how one’s physical body worked. “Physical education, then, was much more than exercising the body. Its subject matter was devoted to maintaining health (3). Books like *Thoughts on Physical Education* by Transylvania medical school physician Charles Caldwell in 1834 (11) and *Physical Education and Preservation of Health* by Harvard medical school physician John Warren in 1845 (50) helped birth the “physical education” movement in America. It was Warren who explained that it was “a general law, that health may be preserved to a late period of life by the use of those things, which are friendly, and the avoidance of those which are noxious. Most diseases are the consequences of violations of the laws of nature, sometimes the result of ignorance, more frequently of inattention” (50).

By the 1880s, the “physical education” movement led to the formation of the American Association for the Advancement of Physical Education, a professional group founded by, dominated by, and presided over, by M.D.s who had faculty appointments at major universities like Johns Hopkins, Yale, and Harvard. Of its first 12 presidents, 11 were physicians. Further, 12 of the 16 members of the Society of College Gymnasium Directors were M.D.s in 1897, the editor of the

American Physical Education Review in the early 1900s was an M.D., and the entire executive committee of the American Society for Research in Physical Education in 1903 were M.D.s (2,21,49). In addition, the following year, 15 out of the 20 members of the American Physical Education Association's National Council were physicians, including the President and Vice President (1). Most of the physicians who taught "physical education" took anthropometric measurements, prescribed exercise, gave health lectures, and supervised the new gyms built on college campuses that the Superintendent of Public Instruction in Massachusetts called "Palaces of Health" (21,49).

One such physician, J. William White, a faculty member at the University of Pennsylvania, wrote in *Lippincott's* magazine in 1887: "Let it be understood that the main object and idea of exercise is the acquirement or preservation of health; that it is by far the most important therapeutic and hygienic agency at the command of the physician of today; that it can be prescribed on as rational a basis with as distinct reference to the correction of existing troubles or the prevention of threatened ones as any of the drugs of the pharmacopeia" (51). Accordingly, because of their perceived importance, by 1900 all states required instruction in the "Laws of Health," which were embodied in the curriculum of "physical education." Interesting too, one of the earliest books about "physical fitness" as we know it today, was *Health, Strength & Power*, written by Harvard M.D. Dudley Sargent in 1904 (43). Further testimony to this long-established link between exercise, health, and medicine was another University of Pennsylvania physician and physical educator's book, *Exercise in Education and Medicine*, published in 1909 by R. Tait McKenzie (36).

THE REFORM OF AMERICAN MEDICINE

By the early 1900s, the field of medicine in the United States began to undergo significant changes. "Heroic" medical practices were replaced with less invasive treatments that evolved out of the scientific research that was beginning to dominate the profession. Bacteriology and the new germ theory impacted past beliefs about public health, disease, and infections, new surgical techniques put more emphasis on treating than preventing, new drugs could now cure, and x-rays along with other instruments moved diagnosis beyond previous limits. Priority was given to fighting infectious diseases like yellow fever, smallpox, influenza, diphtheria, typhus, cholera, and tuberculosis, and to finding effective vaccines. As the American Medical Association gained more power and control, it became evident that hundreds of physicians were being trained at subpar colleges of medicine. This alarming trend was made more public by the Carnegie Foundation Report on *Medical Education* in 1910. Its author, Abraham Flexner, recommended closing 120 of 155 medical schools as "worse than useless" and leveled a scathing blow on the profession (18). Quickly, medical training changed. The number of training colleges decreased, the course of study became longer, the curriculum became more scientific, a greater emphasis was placed on cure rather than prevention, residency programs were instituted, and most physicians

began to specialize. In addition, the number of general hospitals and teaching hospitals increased rapidly. One outcome of these changes was that fewer physicians were being trained and those who were did not look at "physical education" as a field of potential employment or one where their expertise would be best utilized or appreciated. Accordingly, exercise began to lose the attention previously displayed by many physicians.

CHANGES IN "PHYSICAL EDUCATION"

At about this same time in the early 1900s, "physical education" was beginning to experience a shift in emphasis from body development and health instruction to games and sports. What began in the late 1850s as the Muscular Christianity Movement, where high moral standards of character, citizenship, and sportsmanship were viewed as valuable by-products of team sport participation, gained momentum throughout the last half of the 19th century through college and high school sports and the YMCA. After basketball's invention at the Springfield, MA, YMCA in the early 1890s, schools and colleges entered into a massive gymnasium-building spree to accommodate this new indoor game that attracted girls as well as boys. As such, basketball joined football, baseball, track and field, swimming, and tennis, along with several other sports and games, to become the new subject matter of physical education (39). Now, to teach and coach these new games, schools and colleges needed men and women with expertise in one or more sports, not physicians. In addition, many of these new sports specialists also were asked to teach classes in health. Gyms once filled with a variety of exercise equipment and built to support a curriculum dominated by anthropometric measurements administered and analyzed by physicians now featured basketball courts and bleachers for adoring fans. The new role of physical education in high schools and colleges became viewed as "education through the physical" as opposed to its previous goal of "education of the physical," and these remodeled or newly built gyms became the classrooms for physical education classes throughout the land (21,49).

Play, games, and sports were viewed as physical exercise just like gymnastics, exercise machines, or calisthenics had been earlier, but because of the "play movement" of the early 20th century, the philosophy of the Playground Association of America, and research in education, psychology, sociology, and anthropology, the moral and educational benefits of playing games overshadowed their health promotion values (39). Physical education became a sports skills curriculum and forged direct relationships with intramural, interscholastic, and intercollegiate sports. And, as games and sports became central to physical education classes, their competitive nature catered to those students more highly skilled and neglected the majority who were not athletically inclined. The problem with using football, basketball, or softball as the subject matter of the physical education curriculum clearly was stated in a 1905 article in *JAMA*: "The men on the teams are the very ones whom Nature has endowed superabundantly with physical capacity, but on them the physical director spends most of his energies, while the average student is left to get his

physical development by yelling from the bleachers” (19). It was at this time too, that many in the medical community viewed competitive sports as being harmful or potentially dangerous because the level of exertion generally exceeded the rule of moderation basic to the “Laws of Health.”

The number of colleges producing physical educators grew rapidly and the most important part of the training curriculum dealt with teaching games and sports. That physical education had changed to accommodate sports started to become clear by the 1910s. In another Carnegie Report, *American College Athletics* published in 1929, investigator Howard Savage found that only 23 out of the 177 college directors of physical education surveyed had majored in the subject, yet 85% had spent three years on a football team. He also found that 63 out of 130 colleges surveyed had granted their head football coach a faculty appointment, and 55 of those 63 were professors in physical education departments (44). This prompted Savage to state: “Of all the field of higher education, physical education shows the largest number of members with the rank of professor who have only a bachelor’s degree or no degree whatever” (31). Savage concluded by criticizing educators for redefining the purpose of physical education, granting coaches faculty appointments, and preparing coaches to fill positions as physical educators. In a similar study of high school sports in the early 1930s, it was found that in 90% of the 760 schools surveyed, the physical education director and football coach were the same person (31). The “Sports Creed” emphasizing citizenship, teamwork, character, democratic living, and sportsmanship had replaced the “Laws of Health” as the focal point for physical education (15). And, as that took place, the new physical education curriculum focusing on competitive sports required the hiring of coaches, not physicians, and favored those students blessed with physicality, providing very little exercise for those not so fortunate. The anointed role exercise once played in the larger health scheme of America had become lost in new physical activities whose success was measured in win-loss records rather than the overall health of the student body.

PROBLEMS WITH THE “NEW PHYSICAL EDUCATION”

That the “new physical education” was not helping the overall health of millions of American men started to become apparent as early as World War I when one third of the 3 million drafted were deemed physically unfit, and those accepted had to be taught the basic rudiments of hygiene and diet (21). There also were those within physical education, like professor Charles McCloy, an exercise physiologist at the State University of Iowa, who believed his colleagues had gotten carried away with sports and games and argued in the professional literature for a return to the goals of bodily health and physical development from the mid-1930s through the 1950s in articles like: “How about some muscle?” (32), “Endurance” (34), “Forgotten objectives of physical education” (33), and “Why not some physical fitness?” (35). Similarly, the undisputed leader of the physical culture movement, largely popular outside of education, Bernarr Macfadden, who was ridiculed by medicine and physical education alike, was forthright in his belief in the importance of the “Laws of

Health” and began to promote his “Physical Culture Creed” in the 1930s (16). Except for having seven “laws” instead of six, Macfadden’s “creed” was identical to the ancient non-naturals. Further evidence of the failure of the “new physical education” resurfaced again with dismal fitness results for World War II draftees and enlistees and more poignantly in the Kraus-Weber youth fitness test results of the early 1950s that showed the poor fitness of American boys and girls when compared with those in Austria, Italy, and Switzerland. These startling findings led to direct federal government intervention with the formation of the President’s Council on Youth Fitness in 1956 (4,27).

THE REFORM OF PHYSICAL EDUCATION

Like medicine in the early 1900s, the physical education profession came under more scrutiny in the early 1960s. In his book *The Miseducation of American Teachers* in 1963, James Koerner criticized the inferior intellect of faculty, said students in training spent too much time in methods courses, and lamented nonacademic subjects like physical education as part of the “trivia of education” (26). That same year, in yet another Carnegie Foundation Report, *The Education of American Teachers*, author James Conant criticized undergraduate programs for offering courses in football fundamentals and advanced basketball, but was harsher when he discussed graduate education. He wrote: “If I wished to portray the education of teachers in the worst terms, I should quote from the descriptions of some graduate courses in physical education” (12). Conant went on to conclude: “To my mind, a university should cancel graduate programs in this area” (12). This kind of direct criticism, coupled with the call for more science and mathematics as a result of the Soviet Union’s launches of Sputniks I and II and the college athletic scandals of the late 1950s where physical education departments were chastised as the purveyors of “snap courses” for athletes, led to some serious soul searching within the physical education profession.

The most important call for change from within physical education came from Berkeley professor Franklin Henry, who in 1964 published “Physical education: an academic discipline” (22). Deans and department chairs of several Big 10 universities who had come to the same conclusions as Conant, albeit 10 yr earlier, agreed with Henry and reacted with a flurry of changes in the late 1960s. Curriculum reform, higher admission standards, departmental reorganization, and an emphasis on research were examples. More importantly, though, the call for more rigorous programs led to a search for a legitimate field of study. How could physical education become an academic discipline? Agreeing that they really had no field of scientific study comparable to others at major universities, physical educators began to focus on the study of exercise and sport, and departments with titles like exercise science, human movement, and kinesiology were born. Traditional ties with athletics were severed, and as physical education became more scientific, like medicine had done earlier, and the many ramifications of exercise began to be studied, new research coming from laboratories housed in

these new departments began to prove what the nonnatural tradition and the “Laws of Health” had preached for centuries (29). It was becoming evident that both physical activity and physical inactivity were key elements of health.

EXERCISE RETURNS TO THE MEDICAL ARENA

The new exercise science research in the 1960s was built upon the unique and groundbreaking studies of exercise at the Harvard Fatigue Laboratory in the 1930s and '40s and T.K. Cureton's Fitness Laboratory at the University of Illinois in the late 1940s and '50s (4,5), among a few others, along with the findings of epidemiologists Jeremy Morris and Ralph Paffenbarger, who linked physical inactivity with a variety of chronic diseases (14). Scientists in these fields, largely located in the recently restructured physical education departments, looked beyond the American Association for Health, Physical Education, and Recreation (AAHPER) and joined physiologists and cardiologists in the newly formed American College of Sports Medicine (ACSM) for their professional affiliation and utilized its journal, *Medicine and Science in Sports*, as an outlet for their research.

A large contingent of physicians were both founders and charter members of ACSM and, through their efforts, brought exercise back into the medical arena via partnerships with groups like the American Heart Association and the American College of Cardiology (4). It was the study of “heart health” particularly that led to early publications like *Hypokinetic Disease: Diseases Produced by Lack of Exercise*, by Hans Kraus and Wilhelm Raab (28). That exercise was gaining more scientific and medical credibility was further evidenced in Warren R. Johnson's large edited volume, *Science and Medicine of Exercise and Sports* (24). Unique to this research was that it focused generally on “normals” or highly trained humans as compared with much of the earlier work in physiology and medicine that looked at sick and diseased patients. These researchers studied the healthy as opposed to working with the ill and were challenged by learning how to keep healthy people healthy. Accordingly, much of the new exercise science research dealt with various aspects of physical activity, fitness, and health (4). For those who maintained ties with AAHPER, they found a unique publishing outlet in their newly named journal in 1980, *Research Quarterly for Exercise and Sport*.

As more and more research linked heightened fitness levels and increased physical activity with disease prevention, health maintenance, psychological well being, and longevity, American youth fitness test results in the 1970s and 80s created alarming newspaper headlines like: “Youth Going Soft Again,” “Many Children Flunk Fitness Tests,” “2 out of 3 Kids Fail AAU's Fitness Test,” “America's Kids Are Physical Wimps, President's Council Says,” and “Youngsters Are Getting Fatter, Not Fitter.” Interestingly, Pulitzer Prize winning author James Michener was doing the research for his book *Sports in America* when these chilling reports were being published and asked himself, “What could account for the inferior performance, especially when in Olympic competition, or any other kind, our top athletes performed as well as those of other countries and oftentimes much better?” (38)

He answered in his book: “The explanation was simple. Our educational system was stressing so heavily the public games played by a few semi-professional athletes posing as scholars that the general health of the student body was going unattended, and the tests proved this” (38).

EXERCISE, LIFESTYLE, AND PUBLIC HEALTH

The rekindling of interest in the role exercise played in health was further intensified by data that showed that more than one third of all deaths in the United States were due to unhealthy lifestyles (disobeying the “Laws of Health”), along with the rise of new wellness, self-help, and holistic health ideals, the acceptance of complementary and alternative medicines, and the popularity of jogging and other fitness activities like aerobics, bicycling, and running. Exercise was now becoming fashionable and trendy, and an entire new clothing and footwear industry was built upon the health benefits of exercise. At this time too, proving that medicine and public health had done their jobs well in the first half of the 20th century, only 1% of those who died before age 75 did so from infectious disease. Unfortunately though, chronic and degenerative diseases like coronary heart disease (including atherosclerosis, heart failure, hypertension, and stroke), obesity, type 2 diabetes, some cancers, osteoporosis, and sarcopenia replaced infectious diseases and were beginning to cause great human suffering and premature death, affecting 90 million Americans and costing nearly two thirds of a trillion dollars in health care expenses as well as lost productivity (9). Because of these changes and conclusive data emerging from the physical activity epidemiology literature, the ancient “Laws of Health” began to regain their lost position in mainstream medicine, with exercise playing a major role.

It was in the 1970s that the ACSM, American Heart Association, National Institutes for Health, and the Centers for Disease Control, among others, began to take a more serious interest in exercise and health as evidenced by position stands, roundtable discussions, conferences, reports, and books. And mainstream medical journals like *JAMA* and *The New England Journal of Medicine* began to publish articles on many different aspects of physical activity, including the need for exercise advice in the clinical setting. It was in 1979 that the *Surgeon General's Report on Health Promotion and Disease Prevention* called for an attack on chronic disease with increased attention to physical activity and nutrition (47).

During the 1980s, the U.S. Public Health Service identified physical fitness and exercise as one of 15 areas of focus for the national objectives for improving people's health, popular books and bestsellers like the Diamond's *Living Health* were published (13), *The Physician and Sportsmedicine* magazine began its “Exercise is Medicine” campaign, and a striking study published in *JAMA* in 1989 demonstrated a direct correlation between low levels of physical fitness and a high risk of death from all causes (7). These findings and similar data from some of the world's best physicians and leading scientists were expressed more fully in the publication of *Physical Activity and Health: A Report of the Surgeon General*, in 1996 (48). Books too, like David Nieman's *The Exercise-Health Connection — How to Reduce Your Risk of Disease and Other*

Illnesses by Making Exercise Your Medicine, began to appear in the late 1990s (41). By 2001, when another *Surgeon General's Report on Health Promotion and Disease Prevention* was released, physical activity and fitness were at the top of the list of 22 priority areas for improving the nation's health (40).

The culminating event in the revival of the once accepted and then abandoned view that exercise is in fact medicine was the historic meeting on November 5, 2007 at the National Press Club in Washington, D.C., jointly sponsored by the American Medical Association and the American College of Sports Medicine. Here, the Presidents of both organizations introduced their co-sponsored health initiative, Exercise is Medicine™. ACSM president Robert Sallis, a California-based family physician, explained to reporters that “if we had a pill that conferred all the proven health benefits of exercise, physicians would widely prescribe it to their patients and our healthcare system would see to it that every patient had access to this wonder drug.” Similarly, AMA president, the late Ronald Davis, asked his colleagues if they “learned that a single prescription could prevent and treat dozens of diseases, such as diabetes, hypertension, and obesity, would you prescribe it to your patients?” Also in attendance was Rear Admiral Steven Galson, the Acting Surgeon General, who warned that “the practice of engaging in regular physical activity is one which must be adopted broadly — by individuals and families everywhere — if we, as a nation, are to make truly sustained progress in health promotion” (17). Soon thereafter, we began to see both regional and national advertising campaigns focusing on the prescription of exercise for health.

CONCLUSION

It is clear today that physical activity is a viable and relatively inexpensive way to combat most of the nation's most serious diseases that are, for the most part, preventable. This brings us back to a much earlier time when physicians advised patients about their lifestyle as dictated by the “Laws of Health” or the “six things nonnatural.” For example, behavioral causes currently account for 40% of all deaths in the United States, and obesity and physical inactivity combined, along with smoking, are the top causes of premature death (45). All three have held central positions in the nonnatural tradition for centuries. With respect to exercise in particular, a recent *JAMA* article advised that “physical activity, while not a drug, can behave like one” (30). The author suggested that “health care professionals, including physicians, are encouraged to prescribe physical activity for health. It is plausible that there is a minimum dose of physical activity for health benefits, that these benefits increase with increasing dose, and that beyond a certain dose, adverse effects outweigh benefits” (30). Even more recently, in the *British Journal of Sports Medicine*, Steven Blair argued that “evidence supports the conclusion that physical inactivity is one of the most important public health problems of the 21st century, and may even be the most important” (8). Finally, the publication of ACSM's *Exercise is Medicine: A Clinician's Guide to Exercise Prescription* in 2009 (25), brings us back to a point where we were hundreds of years ago when prescribing lifestyle modification was a regular and expected

duty of one's physician. With recent data suggesting that nearly two thirds of patients would be more interested in exercising to stay healthy if advised by their doctor, we may be coming to a time in history where we can begin to regain national health through more effective guidance and counseling from the medical community coupled with the expertise of knowledgeable and well trained exercise practitioners motivated by health outcomes instead of medals and trophies.

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