**Journal of Exercise Medicine online**

**February 2018**

**Volume 3 Number 1**

Official Research Journal of the American Society of Exercise Physiologists

ISSN 2378-4083



**JEMonline**

**Looking into the Future: Where Will Exercise Physiology Be?**

Tommy Boone, PhD, MPH, MAM, MBA, FASEP

Board Certified Exercise Physiologists, American Society of Exercise Physiologists, USA

##### ABSTRACT

**Boone T.** Looking into the Future: Where Will Exercise Physiology Be? **JEMonline**2018;3(1):1-8. The purpose of this article was to highlight the students of the Exercise Physiology degree as health care professionals. The CDC says, “The aging of our population has wide-ranging implications for virtually every facet of American society…” and “…profound effects on the nation’s public health, social services, and health care systems”. Exercise is indicated in the prevention and treatment of a large number of diseases and disabilities. By 2030, health care spending is expected to increase by 25%, which is a projected increase from $555 billion in 2011 to $903 billion in 2020. Of course, on the positive side, research indicates that people who do not smoke, eat a healthy diet, and engage in regular exercise will decrease their risk of developing heart disease, diabetes, cancer, and other chronic diseases. The publication of ***ASEP’s Exercise Medicine Text for Exercise Physiologists*** is the exercise physiologists’ guide to prescribing regular exercise to prevent and treat chronic diseases. Unfortunately, physicians are apparently not that interested in consulting with their patients for reasons of lack of knowledge and/or experience and the fact that it is hard to get reimbursed for their time. Handing out a pill for a particular disease is reimbursed. Similarly, physician referrals to exercise physiologists are not common. **However, with respect to ASEP Standards of Practice, they indicate that: “**Individual ASEP members who engage in the practice of exercise physiology shall adhere to the ASEP Code of Ethics. Adherence to the Code is expected, and is based on the belief that Exercise Physiologists are self-regulated, critical thinkers who are accountable and responsible for their high-quality competence in the practice and delivery of exercise physiology concepts, ideas, and services. Where will exercise physiologists be? The answer is simply this: With the support of the American Society of Exercise Physiologists, the ASEP Board Certified Exercise Physiologists will be recognized as credible 100% health care professionals responsible for the prescription of exercise medicine.

**Key Words:** ASEP Board Certified Exercise Physiologists, Exercise Medicine

**INTRODUCTION**

Exercise physiology has a great history as being an interesting academic course in the Health and Physical Education degree. Of course, the actual title was (and still is in many academic settings) the “Physiology of Exercise” course, which was always the opportunity for physical education students to gain an understanding of the myriad of the acute and chronic physiological adaptive responses to physical activities, regular exercise, and athletic training and performance.

Of course, the students of the Exercise Physiology degree also take several related courses to ensure they understand the benefits of regular exercise for individuals of all ages and gender. The benefits are both physical and mental with physiological changes at the molecular and cellular levels. The adaptations not only allow for increased athletic performances, but also allow for the upkeep of the body as well as the prevention and treatment of the early onset of chronic diseases and disabilities.

Interestingly, while it is obvious to exercise physiologists that “exercise is medicine”, the same thinking is either not accepted or contemplated by the general population. The same is true for the benefits of resistance training to build and preserve skeletal muscle mass. Such training not only promotes the learning and execution of athletic skills, it is essential to avoiding sarcopenia and the decrease in lean muscle mass and strength with aging. Yet, most people in society, particularly among the middle aged and older do not engage in an overall improvement in health and well-being by either weight training or both resistance and endurance exercise training.

Exercise physiologists and other health care professionals understand that relatively intense interval exercise sessions immediately before eating breakfast, lunch, and dinner have a positive influence on controlling blood glucose that emphasizes the importance of regular exercise in preventing type 2 diabetes. The fact that exercise training impacts the whole body is not a hidden scientific finding by any means. Zierath and Wallberg-Henriksson (18) highlight this point extremely well in their 2015 article. For example, they indicate that future challenges will include the integration of an individual’s genetic and epigenetic background, with the tissue-specific gene expression, proteome, and metabolic profiles to predict improvements in whole-body glucose, homeostasis, strength, and aerobic capacity, and that given the variable improvements in physical activity between individuals enrolled in an exercise training program, prognostic exercise-sensitive biomarkers of circulating factors that mirror improvements in whole-body glucose or lipid metabolism may also offer a means to individually tailor exercise training programs to maximize the health-promoting benefits on an individual level.

Both statements are important backdrops to the growth in the older adults throughout the world, and particularly in the United States. Americans aged 65 years or older during the next 7 years are expected to increase to ~72 million (11). The CDC says, “The aging of our population has wide-ranging implications for virtually every facet of American society…” and “…profound effects on the nation’s public health, social services, and health care systems”. The rise in chronic diseases, in particular, will create major problems without an increase in qualified health care professionals.

By 2030, health care spending is expected to increase by 25%, which is a projected increase from $555 billion in 2011 to $903 billion in 2020. Of course, on the positive side, research indicates that people who do not smoke, eat a healthy diet, and engage in regular exercise will decrease their risk of developing heart disease, diabetes, cancer, and other chronic diseases (9). But, unfortunately, at the present time, there is no positive side because Americans are not engaging in regular exercise. As a result, the U.S. Department of Health and Human Services (16) highlight this point by saying that: “More than a quarter of all Americans and two of three older Americans have multiple chronic conditions, and treatment for this population accounts for 66% of the country’s health care budget.”

Why do so many Americans suffer from chronic diseases? The short-answer is because they are physically inactivity. There is overwhelming scientific evidence that this is the case. Booth et al. (6) indicate that: “Physical inactivity is a primary cause initiating 35 separate pathological and clinical conditions.” In other words, a sedentary lifestyle allows the circulatory, respiratory, and muscular systems to decrease in structural and functional ability to supply oxygen to sustain body functions (such as physical activity). The negative shift towards a low VO2 max increases mortality, independent of other risk factors.

The point is that there is considerable number of research papers by a multitude of different health care professionals from around the world that have reached the same conclusion. Exercise is indicated in the prevention and treatment of a large number of diseases and disabilities (11,12,147). The research findings indicate that exercise medicine is just as effective as traditional medical treatment (13). So, why haven’t the medical doctors stepped up to the plate and adjusted their medical practice to include the education and hands-on laboratory skills of the college graduates with an exercise physiology degree?

Is it because they think that exercise physiology is exercise science? If that is the case, they are not by themselves because many professors of exercise physiology are equally misled (4). Strangely enough, the upper administration of colleges throughout the United States needs help in cleaning up the outdated college degree programs. In fact, answer this question: Where do college graduates with a kinesiology degree, an exercise science degree, or a human performance degree find work? Have you ever read a job posting for a kinesiologist in your local newspaper? No, but even if you did – was it a frequent occurrence? These degrees are nothing more than a waste of time and money by both the students and their parents. Why? They are not market-driven degree programs.

Exercise physiology is a market-driven degree. It is the new 21st century healthcare profession (5). The American Society of Exercise Physiologists (ASEP) was started in 1997 to promote the professionalism and professional development of exercise physiologists via academic accreditation. The organization has its own Board of Ethics, Board Certification, and Standards of Professional Practice (2) to guide, define, and promote exercise physiologists. Yet, even though it is clear that exercise physiologists need their own professional organization, a large number of exercise physiologists and college teachers continue to look to generic organizations for leadership.

The ASEP leadership understands that research from around the world agrees that physical activity is linked to disease prevention, psychological well-being, and longevity. A person’s lifestyle matters, particularly if it consists of exercises such as jogging, bicycling, and resistance training. Those who engage in regular exercise are less likely to suffer from coronary heart disease, obesity, type 2 diabetes, osteoporosis, sarcopenia, and some cancers (5,10).

While this thinking has been understood for 90+ years, it appears that the collective body of researchers, teachers, organizations, and institutes are still preaching the same message (i.e., the role exercise plays in preventing chronic diseases). In other words, regardless of the research papers by some of the world’s best researchers, the published papers by leading scientists, and the public health and governmental meetings, books, and publications, chronic diseases and deaths continue to increase.

Interestingly, the Acting Surgeon General, Steven Galson, said: “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” (8). Also, it is important that the medical community recognizes exercise physiologists (and, particularly, the ASEP Board Certified Exercise Physiologists) as “the” health care professionals to prescribe exercise medicine. In this regard, the publication of ***ASEP’s Exercise Medicine Text for Exercise Physiologists*** is the exercise physiologists’ guide to prescribing regular exercise to prevent and treat chronic diseases (3).

Board Certified Exercise Physiologists are qualified to prescribe exercise medicine as medicine. This is what the ASEP leaders assert and a growing number of exercise physiologists concur, especially since the scientific medical benefits of exercise are real. Obviously, regular exercise is a powerful means to improving both the quality and duration of life. In addition to the improvement in muscle strength and endurance, the person who exercises regularly experiences a more efficient cardiorespiratory system, and improvement in mental function, brain cognition, and mood. There is also better control of body weight, including maintaining weight loss due to an increase in metabolism, aside from effectively dealing with diseases that negatively influence the heart and musculoskeletal systems, type 2 diabetes, and various cancers.

Given all the information that we know about the benefits of regular exercise, why is it that exercise physiologists, especially the ASEP Board Certified Exercise Physiologists, are not a vital member of the physicians’ health care team? Why aren’t the medical doctors talking more about the benefits of exercise to their patients? You may say that they are, but frankly where is the evidence otherwise? I suppose if regular exercise could be reduced to an actual “pill”, it would be the most widely prescribed medication. Think about it. How many medical doctors are educated by exercise physiologists as professors in medical schools throughout the United States? The answer is likely zero or very close to it. The bottom line is that the majority of the physicians either think that exercise medicine does not play a critical role in prescribing a well-designed individualized exercise program or they are too busy to do something different in their practice.

Nicholas DiNubile, MD, who is a trained orthopedic surgeon (7), “believes that exercise prescription should be part of the core curriculum in every medical and nursing school in the nation”. Yet, what he doesn’t say (but I think he would agree) is that every medical school should hire doctorate-prepared exercise physiologists to teach the scientific methods of prescribing exercise medicine. Wouldn’t it be a boost for both the medical profession and the profession of exercise physiology if that was the case? After all, the daily habit of regular exercise is documented to result in highly specific adaptations that include structural, hormonal, and biochemical changes help to prevent and treat chronic diseases.

Given these health care outcomes, why is it that only 10% of Americans meet physical activity guidelines of 150 minutes of moderate to vigorous activity per week (15)? Surely, Americans of all ages understand that exercise is medicine. But, nonetheless, their daily reality is to enjoy life regardless of their poor habits and lack of help from the medical community. Unfortunately, physicians are apparently not that interested in consulting with their patients for reasons of lack of knowledge and/or experience and the fact that it is hard to get reimbursed for their time. Handing out a pill for a particular disease is reimbursed. Similarly, physician referrals to exercise physiologists are not common. Lack of communication and initiative between physicians (who has access to patients and their health records) and exercise physiologists have kept exercise physiologists from being part of the traditional health care system.

What physicians could do is to reach out to exercise physiologists by contacting the American Society of Exercise Physiologists. The organizational leaders have an official list of the ASEP Board Certified Exercise Physiologists. The list is not presently broken down by professional interest in terms of referrals from their community physicians, but it could be. Also, the idea that physicians are hesitant to refer patients for exercise to “fitness professionals” because they do not have any way to follow up on the patient’s progress does not make sense (17). While it is true that exercise physiologists are not your typical fitness professional from the personal trainer point of view, it should not be a problem for exercise physiologists and physicians to communicate directly with each other. All it takes is a little upfront communication between the physician and the exercise physiologist on behalf of the patient. Is there going to a cost factor associated with the exercise medicine prescription? Yes, the exercise physiologists’ work with the patients has a cost factor, but the amount does not have to be beyond the patients’ out-of-pocket ability to pay.

**With respect to ASEP Standards of Practice (1), they indicate that: “**Individual ASEP members who engage in the practice of exercise physiology shall adhere to the ASEP Code of Ethics (2). The Code provides guidance for decision-making concerning ethical matters, and serves as a means for self-evaluation and reflection regarding the ethical practice of exercise physiology. Adherence to the Code is expected, and is based on the belief that Exercise Physiologists are self-regulated, critical thinkers who are accountable and responsible for their high-quality competence in the practice and delivery of exercise physiology concepts, ideas, and services. The Code is organized around 10 primary values that are central to ethical practice of exercise physiology.

The Exercise Physiologist shall:

1. Accurately communicate and provide health and fitness, educational, preventive, rehabilitative, and/or research services equitably to all individuals regardless of social or economic status, age, gender, race, ethnicity, national origin, religion, disability, diverse values, attitudes or opinions.
2. Be accountable for individual non-medical judgments and decisions about health and fitness, preventive, rehabilitative, educational, and/or research services.
3. Maintain high quality professional competence through continued study of the latest laboratory techniques and research in preventive and rehabilitative services.
4. Be expected to conduct health and fitness, preventive, rehabilitative, educational, research, and other scholarly activities in accordance with recognized legal, scientific, ethical, and professional standards.
5. Respect and protect the privacy, rights, and dignity of all individuals by not disclosing health and fitness, rehabilitative, and/or research information unless required by law or when confidentiality jeopardizes the health and safety of others.
6. Call attention to unprofessional health and fitness, preventive, rehabilitative, educational, and/or research services that result from incompetent, unethical, or illegal professional behavior.
7. Contribute to the ongoing development and integrity of the profession by being responsive to, mutually supportive of, and accurately communicating academic and other qualifications to colleagues and associates in the health and fitness, preventive, rehabilitative, educational and/or research services and programs.
8. Participate in the profession's efforts to establish high quality services by avoiding conflicts of interest and endorsement of products and supplements in the health and fitness, preventive, and/or rehabilitative service and programs.
9. Participate in and encourage critical discourse to reflect the collective knowledge and practice within the exercise physiology profession to protect the public from misinformation, incompetence, and unethical acts.
10. Provide health and fitness, preventive, rehabilitative, and/or educational interventions grounded in a theoretical framework supported by research that enables a healthy lifestyle through choice.”

Where will exercise physiologists be? The answer is simply this: With the support of the American Society of Exercise Physiologists, the ASEP Board Certified Exercise Physiologists will be recognized as credible 100% health care professionals responsible for the prescription of exercise medicine.

**Address for correspondence:** Tommy Boone, PhD, MPH, MAM, MBA, 104 Taylors Cove, Beaumont, TX 77705, Email: tbooneasep@gmail.com

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