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About the Authors:

Daniel Millrood, PT, EdM, has been practicing, teaching, and promoting physical therapist practice and research that focuses on preventive health care, injury prevention, health promotion, physical fitness, and wellness for the last 3 decades. After receiving an undergraduate degree in biopsychology from Columbia College in 1986 and a master's degree in physical therapy from Columbia College of Physicians and Surgeons in 1988, Millrood received a master's degree in applied physiology from Columbia University's Teachers College under the advisement of Ronald Demeersman, PhD, and Jason Mateika, PhD. He continues his doctoral work at Teachers College in applied physiology. During his high school and collegiate tenure, Millrood also held several state and regional powerlifting titles and was ranked nationally.

Millrood's interest and passion for physical therapy in preventive health care and wellness evolved while practicing in a variety of settings where many patients and clients were treated for injury and disease that resulted from a lack of physical fitness and general conditioning. This served as the inspiration for the Adult Fitness Examination, which Millrood started developing in the early 1990s.

Millrood created, implemented, and directed the academic and research coursework for physical therapy in preventive health care and wellness for the Doctor of Physical Therapy Program at New York Medical College in 2005. Millrood also brought his coursework to the DPT and t-DPT programs at Dominican College in New York, where he currently teaches. Millrood continues to provide educational coursework for clinical implementation of physical therapy in preventive health care and wellness for postprofessional continuing education coursework.

Millrood currently owns an outpatient private practice that emphasizes physical therapy as an integral component of a multidisciplinary health care team that focuses on obesity and diabetes prevention and treatment, in addition to general community-based health promotion, injury prevention, and wellness interventions across the lifespan. He also has an avid interest in health care consumer advocacy, and owns and operates an organic farm that promotes healthy living through community-supported agricultural programs. It is Millrood's hope and dream that physical therapist practice will continue to evolve to promote public health through preventive services in addition to the rehabilitative services that physical therapists typically provide.

Charlotte Chua, PT, DPT, is the director of physical therapy at Queens Boulevard Extended Care Facility in Woodside, NY. Chua completed her doctoral thesis at New York Medical College under the advisement of Daniel Millrood, PT, EdM, and graduated summa cum laude in 2005 as a member of the college's first-ever DPT class. Chua's thesis provided foundational work for the Adult Fitness Examination. Chua is recognized as a master clinician by New York University, serving as a clinical instructor for students throughout the Northeast.



Foreword

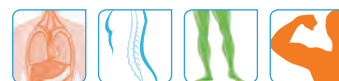
It is almost incomprehensible that despite ongoing advances in biomedical, pharmaceutical, and information systems technologies, the current health care system in the United States of America is failing. The United States spends more per capita on health care than any other nation. The incidence and/or cost of managing obesity, heart disease, type 2 diabetes mellitus, osteoarthritis (OA), and cancer are enormous. The statistics are staggering:

- According to the American Heart Association, the direct and indirect costs of medical treatment related to heart disease (suffered by 1 in 3 Americans), was \$444 billion in 2010.¹
- The Centers for Disease Control and Prevention reported in 2009 that chronic disease accounts for about 75% of the nation's aggregate health care spending—or \$5,300 per person each year. In taxpayer-funded programs, treatment of chronic disease constitutes an even larger proportion of spending—96 cents per dollar for Medicare and 83 cents per dollar for Medicaid.²
- The journal *Arthritis and Rheumatism* reported that in 2009 the cost of health care related to OA was \$185.5 billion.³
- A 2011 study by the Society of Actuaries estimates the United States spends \$270 billion per year in preventable health care costs, lost productivity, disability, and premature death from chronic conditions related to overweight and obesity.

Meanwhile, consumers have little confidence in the current health care system. Something must be done. The Patient Protection and Affordable Care Act of 2011 may or may not have been the answer, but the triple aims of health care reform—focusing on cost, access, and quality of care—are solid. A system that emphasizes preventive, patient-centered care, provided and managed by a multidisciplinary team of providers that includes physical therapists (PTs) as specialists on movement and function, is a solution that would allow our health care system to cost-effectively maximize the amazing resources we have at our fingertips.

APTA envisions physical therapists as primary-point practitioners in the preventive health care arena. To achieve that vision, PTs must be aggressively trained at entry level and postprofessionally. How can physical therapist educators, clinicians, and researchers approach this task?

When I started practicing physical therapy in the late 1980s, referrals for our services were typically generated by other health care team members, after disease or injury already had affected patients and their families, caregivers, and third-party payers. It was clear to me that skilled physical therapist services prior to the onset of injury, disease, and illness, including direct intervention and patient education, could have helped prevent the unwanted suffering and loss of quality of life that resulted from a lack of physical fitness. There was, however, no industry standard, no formal training, no physical therapy-based approach to address this need. This realization led to the development of a physical therapy-based adult fitness examination, a tool that can assess fitness parameters that are related to injury, disease, a lack of wellness, decreased function, and a reduction in quality of life. The foundational thought process was that PTs could identify and address factors that frequently contribute to injury, disease, and the increased cost of care related to treating preventable conditions.



The ongoing rise of the clinical doctorate, direct access, and autonomous physical therapist practice brings great opportunity to our profession. The recent evolution of health care as a commodity enables PTs to meet the market demand for a less invasive, more cost-effective product that produces better outcomes. By using fitness assessment tools across the lifespan, PTs can obtain baseline and follow-up measurements of specific fitness parameters related to public health; these can educate and train patients and clients in individually tailored exercise programs that address potential fitness impairments that can result in costly injury and disease. The provision of evidence-based care, with related measureable outcomes, could allow PTs to have a great impact in the future of health care.

As PTs seize this promising opportunity offered during the rapid evolution of the American health care system, we can cement an important role on the multidisciplinary health care team into the future, ensuring our participation in an effective approach to improved health for our patients and clients at a reduced cost and, thus, the employment of physical therapy clinicians, during a transition that will bring deep cuts in unnecessary services and related costs.

It is the dawn of a new era that will allow physical therapy to flourish and provide maximal impact on the health care system. We have studied and trained hard. It is time for us to embrace this opportunity. Please enjoy this text as it guides you through a new way of thinking and a new method of examination that will allow physical therapist clinicians the chance to offer our patients and clients everything we can offer to help—person-by-person rather than body part-by-body part. By examining and treating the whole patient in a comprehensive, cost-effective, evidence-based approach that uses measurable outcomes, we can maximize the impact we can have on the lives of our patients and clients.

REFERENCES

1. American Heart Association. *Forecasting the Future of Cardiovascular Disease in the United States*. A Policy Statement From the American Heart Association; 2011. <http://circ.ahajournals.org/content/123/8/933.full>. Accessed July 23, 2012.
2. Centers for Disease Control and Prevention. *Chronic Diseases: The Power to Prevent, The Call to Control: At a Glance 2009*. Webpage. <http://www.cdc.gov/chronicdisease/resources/publications/AAG/chronic.htm>. Accessed July 23, 2012.
3. Kotlarz H, Gunnarsson CL, Fang H, Rizzo JA. Insurer and Out-of-Pocket Costs of Osteoarthritis in the US: Evidence From National Survey Data. *Arthritis and Rheumatism*. 2009;60(12):3546-3553.



Adult Fitness Examination: A Physical Therapy Approach

The Adult Fitness Examination (AFE) contained in *Adult Fitness Examination: A Physical Therapy Approach* is a comprehensive, noninvasive, evidence-based physical therapy approach to assessing the fitness of asymptomatic adults. It incorporates fitness components of musculoskeletal alignment, balance, range of motion, and manual muscle testing that are not addressed by the American College of Sports Medicine (ACSM). The AFE measures functional performance and uses common physical therapy tests and measures. The AFE can be used to monitor wellness outcomes over time and promotes interdisciplinary communication regarding adult fitness.

Adult Fitness Examination: A Physical Therapy Approach comprises the following sections:

- **GENERAL OVERVIEW**—The background information about the structure and components of the AFE.
- **INSTRUCTIONS**—Step-by-step directions on how to conduct the tests and measures, as well as normative data.
- **WORKBOOK**—The physical therapist uses it during the test to document findings of the AFE.
- **CLIENT TAKE-HOME FORM**—An easy-to-understand guide about the AFE and the results of the evaluation. The therapist fills it out and gives to the patient/client with recommended activities and exercises to address areas of weakness while maintaining/improving all other areas.



General Overview of the Adult Fitness Examination

Physical therapists (PTs) are health care providers that play an increasingly important role in health promotion, injury prevention, and wellness. APTA's *Guide to Physical Therapist Practice*, 2nd edition, states that physical therapists “provide prevention and promote health, wellness, and fitness.”^{1(p32)} APTA's Vision 2020 states that physical therapists should emerge as practitioners of choice for health promotion, injury prevention, fitness, and wellness.² A growing number of physical therapists are voicing interest and actively practicing to promote health and prevent injury across the client's lifespan. Simultaneously, academicians are developing curricula that will prepare physical therapist students and post-professionals to be practitioners of choice for prevention of impairments in body functions and structures, activity limitations, and participation restrictions (collectively termed “disability”).

The academic and clinical training that prepares PTs to serve a key role in preventive health care and wellness provides many evaluative tools and techniques that PTs can use to assess adult fitness. Traditionally, physical therapy services are sought when a person has difficulty with daily functional activities, and PTs gauge how an individual deviates from the general population. PTs can use these same skills and methods to determine an asymptomatic individual's current level of physical fitness as well as gauge changes in the individual over time. A standardized, physical therapy-based fitness examination tool to determine the overall physical fitness level of an adult client can provide clinicians with data that can be used to educate and guide clients to better health, while facilitating a continuum of care within a multidisciplinary, team-based health care model.

PTs, other health care providers, and third-party payers can share standardized and universally accepted client fitness measures to optimize physical wellness outcomes. In addition, gearing treatment toward early intervention and prevention has the potential to reduce overall health care costs by monitoring a client's fitness level and addressing potential problems. The Adult Fitness Examination (AFE) contained herein was developed in response to this need. The AFE synthesizes evidence-based, entry-level PT examination techniques and measures into a cost-effective, user-friendly, clinically relevant protocol that can be administered to an adult wellness client.

The AFE was developed to determine physical fitness levels for asymptomatic individuals 18–65 years of age, using common physical therapy tests and measures to quantify and qualify key components of physical health and wellness. Significant components of physical health and wellness are³:

- Cardiovascular/Cardiorespiratory Fitness
- Musculoskeletal Alignment and Development
- Body Composition
- Musculoskeletal Fitness
- Muscular Strength and Endurance
- Balance
- Aerobic Endurance

The AFE is designed to be conducted by a PT in a typical clinical setting. The tests and measures are structured for efficiency and safety, beginning with a preparticipation screening.

