Qualified exercise professionals

Best practice for work with clinical populations

Darren E.R. Warburton PhD **Sarah A. Charlesworth** PhD **Heather J.A. Foulds** MSc **Donald C. McKenzie** MD PhD
Roy J. Shephard MD PhD DPE FACSM **Shannon S.D. Bredin** PhD

Regular physical activity is important in primary and secondary prevention of at least 25 chronic conditions.[1-5] Physically active individuals have at least 20% to 35% lower risk of all-cause mortality and chronic conditions such as breast and colon cancer, cardiovascular disease, and diabetes.[3] Even greater risk reductions (often >50%) are seen when estimates of benefit are based on direct measures of aerobic fitness or objective activity monitors rather than questionnaires.[4] Regular physical activity and exercise interventions are also beneficial for improving health status and quality of life, as well as reducing risk of premature all-cause and disease-specific mortality in asymptomatic and symptomatic populations.[1,2,4,5]

The risks of well-designed and appropriately supervised exercise interventions are remarkably low for asymptomatic and symptomatic populations alike.[6-14] In fact, the benefits of being physically active far outweigh the transient risks of becoming more physically active or participating in a well-designed and appropriately supervised training program.[3,4] Therefore, a reduction of barriers to physical activity is warranted for most individuals, and indeed is based on a sound body of evidence. As such, the new risk stratification and physical activity clearance strategy (ie, the new PAR-Q+ [Physical Activity Readiness Questionnaire for Everyone] and the ePARmed-X+ [electronic Physical Activity Readiness Medical Evaluation]) are greatly reducing the barriers to physical activity participation for everyone.[15,16] However, the need to ensure safe and effective opportunities for physical activity is also built into this new strategy.

In recent years, there has been an exponential growth in companies and organizations that claim that their members can provide exercise programs for asymptomatic and symptomatic populations, often despite their members' limited formal postsecondary education or clinical training. Many agencies serve to gain financially from moving into the domain of clinical exercise physiology. The requisite training and formal qualification needed to work with various populations (particularly individuals living with chronic disease) remains unclear. Currently, the individual patient and physician concerned are often left with difficult decisions regarding the qualifications of fitness professionals. The lack of information regarding acceptable levels of training and core competencies coupled with the current lack of qualified individuals who work with not only the general public but also with clinical, including moderate- to higher-risk, populations might be creating a dangerous situation. There is thus a need for a critical evaluation of the literature to determine what training is prerequisite for working with various categories of clientele (including those living with chronic disease).[17,18] Therefore, the primary purpose of this systematic review of the literature is to provide both physicians and the general public with evidence-based recommendations on "best practice" in clinical exercise physiology, noting in particular the core competencies, educational requirements, and practical experience needed to serve individuals with chronic disease.[4]

Discussion

This systematic review is built upon the systematic reviews undertaken for the new PAR-Q+ and ePARmed-X+ instruments, highlighting various clinical conditions in which there is strong evidence that services should be provided by appropriately trained exercise professionals. A rigorous, systematic, and critical evidence-based approach was taken to examine the current levels of evidence relating to best practice in clinical exercise physiology and rehabilitation. A review of recent litigation involving fitness professionals provided insight into the medicolegal requirements of being classified as a qualified exercise professional. This included an evaluation of case law relating to incidents of personal injury and ordinary negligence lawsuits brought against exercise and fitness professionals.

Our systematic review reveals that qualified exercise professionals currently play an important role in exercise testing and training of both asymptomatic and clinical (symptomatic) populations in a variety of settings.[4,17] Qualified exercise professionals have increasingly assumed the role of primary specialists in the conduct of clinical exercise stress tests. In such situations, exercise professionals generally work in medical settings, with a physician in close proximity and with rapid access to emergency equipment needed to treat any adverse events.[4,17] Our systematic review shows that stress testing conducted by paramedical staff (including qualified exercise professionals) does not increase the risks of clinical stress testing relative to tests directly supervised by a physician, provided that appropriate training, resources, and emergency procedures are available.[4,19] **Table 1** provides specific recommendations.

As part of the interdisciplinary health care team, qualified exercise professionals are required to adhere to

standards established by other allied health professions (**Table 1**). Moreover, a series of discipline-specific core competencies has been established for qualified exercise professionals who propose to work with those who have moderate- to higher-risk conditions (**Table 1**). Explicit in these recommendations is the need for advanced postgraduate education and clinical internships for those supervising higher-risk individuals who are seeking to become more physically active. These recommendations for clinical internships are consistent with the requirements of other allied health professions, in which extensive clinical case studies and directly supervised clinical practice are required before certification.[20] It should be highlighted that this standard is currently above that seen in the Canadian health and fitness industry, pointing to the need for the development of more advanced certification and training. The recommendations regarding mandatory general and discipline-specific core competencies are also supported by a series of successful lawsuits against "personal trainers" and "fitness professionals" who were inadequately trained, did not follow evidence-based best practices, or did not work within a clearly defined scope of practice.

A strong recommendation (based on expert opinion) was that persons wishing to work with higher-risk clientele should pass rigorous, independent,

Table 1. Recommendations regarding qualified exercise professionals

RECOMMENDATION	LEVEL*†	GRADE†‡
Clinical exercise stress testing can be conducted by qualified exercise physiologists (ie, university-trained exercise physiologists with advanced training and certification), provided that a physician and emergency response equipment are readily available	II	A
Qualified exercise professionals should be trained to deliver patient-centred care, work in interdisciplinary teams, perform evidence-based best practice, employ quality improvement and control processes, and make use of information technology to improve patient care	IV	C
Qualified exercise professionals should possess a series of discipline-specific core competencies before working with those with higher-risk conditions (eg, pregnancy, various chronic diseases). These core competencies include the following: • an in-depth knowledge of the acute and chronic responses, as well as adaptations, to physical activity in both healthy and clinical populations; • a clear understanding of how commonly used medications influence the response to physical activity; • an understanding of how various comorbidities affect the response to physical activity; • a comprehensive knowledge of the design and implementation of safe and effective exercise prescriptions for patients with chronic disease, functional limitations, or disabilities; • a critical, in-depth understanding of diagnostic stress testing protocols and procedures; • an ability to interpret both resting and exercise 12-lead electrocardiograms and rhythm strips; • a knowledge of effective risk factor stratification and modification; • an ability to provide hemodynamic and electrocardiographic monitoring by telemetry; • effective skills in educating about and counseling on health behaviour modification; • the ability to accurately measure blood pressure at rest and during exercise by auscultation; • a thorough knowledge of the indications and contraindications to physical activity; • an ability to determine when to terminate exercise testing or training; • an ability to respond to emergency situations (including the provision of effective cardiopulmonary resuscitation and automated external defibrillation, as appropriate); • an ability to create and respond to a written emergency plan that is appropriate to the testing and training facility; and • an understanding of the behavioural change model and strategies that need to be considered and appropriately applied when working with patients	IV	C
Graduates of exercise science programs destined for clinical employment should complete a clinical internship	IV	C
Practical skills in clinical exercise testing and prescription should be tested directly	IV	C
Physicians interested in health promotion and lifestyle behaviour modification should work in close collaboration with allied health professionals who have specialized training in these fields (including qualified exercise professionals) in order to optimize patient-centred care	IV	C
Qualified exercise professionals should pass rigorous, independent, national-level written and practical examinations to establish their competency to work with at-risk populations	IV	C

*Level I evidence includes randomized controlled trials; level II evidence includes randomized controlled trials with important limitations or observational trials with overwhelming evidence; level III evidence includes observational trials; and level IV evidence includes anecdotal evidence or expert opinion.
†A strong expert opinion recommendation would receive a IV-C rating.
‡Grade A recommendations are strong; grade B recommendations are intermediate; and grade C recommendations are weak.

national-level written and practical examinations before working with clinical populations. This recommendation was based on the fact that most of the studies revealing the health benefits and safety of exercise interventions in intermediate- to high-risk clinical populations adopted rigorous supervision and control procedures involving qualified exercise professionals with advanced clinical training and certification. The recommendation also took into account evidence that many North American undergraduate exercise science and kinesiology curriculums failed to provide adequate preparation and evaluation of theoretical and practical knowledge in clinical exercise physiology and rehabilitation.[4,21] Therefore, it is important for physicians to recognize that individuals who have merely completed a degree in kinesiology and the exercise sciences (without further evaluation of clinical competencies) cannot automatically be considered competent for practice in clinical settings.

Physicians play a prominent role in maintaining population health.[22] Approximately 80% of the Canadian population meets with a physician at least once per year, offering a good opportunity for the promotion of healthy behaviour.[22] Unfortunately, physicians experience various barriers to providing physical activity and other health behaviour counseling,[23,24] including limited access to educational materials, a lack of staff support and resources, an excessive workload with limited time for effective health promotion counseling, and limited specialized training regarding methods of enhancing aspects of lifestyle behaviour such as diet and physical activity.[22,25] Our systematic review leads to the strong recommendation that physicians take advantage of the specialized training of qualified exercise professionals in health promotion and lifestyle behaviour modification. It is anticipated that this collaborative approach will enhance patient-centred care and reduce the burden of physical activity clearance and counseling often placed on physicians.[4]

Conclusion

Most of the studies that reveal the health benefits of exercise interventions in intermediate- to high-risk clinical populations have adopted rigorous supervision and control procedures that are often not available in the community. There is often close medical supervision and exercise interventions developed by individuals with graduate training in the exercise sciences or physiotherapy. Although the risks associated with well-supervised exercise programs are low, the potential remains for an unqualified individual to cause harm to an at-risk person. Current evidence indicates that qualified exercise professionals working with clinical populations must demonstrate a clear knowledge of the absolute and relative contraindications to exercise for various populations via satisfactory completion of a national theoretical and practical examination. A general undergraduate degree in exercise sciences or kinesiology currently provides insufficient qualification for work with clinical populations. The qualified exercise professional is an important member of the health care team, providing unique expertise in health promotion and lifestyle behaviour modification for both the primary and secondary prevention of chronic disease.

Dr Warburton is Associate Professor at the University of British Columbia (UBC) in Vancouver, Director of the Cardiovascular Physiology and Rehabilitation Laboratory, and Co-Director of the Physical Activity and Chronic Disease Prevention Unit. **Dr Charlesworth** is Research Fellow at UBC. **Ms Foulds** is a doctoral student in Experimental Medicine at UBC. **Dr McKenzie** is Professor in the School of Kinesiology and Director of the Allan McGavin Sports Medicine Centre at UBC, and is a sports medicine physician. **Dr Shephard** is Professor Emeritus of Applied Physiology in the Faculty of Kinesiology and Physical Education at the University of Toronto in Ontario. **Dr Bredin** is Assistant Professor in the School of Kinesiology at UBC, Director of the Cognitive and Functional Learning Laboratory and the Systematic Reviews Research Laboratory, and Co-Director of the Physical Activity and Chronic Disease Prevention Unit.

Competing interests
None declared

Correspondence
Dr Shannon S.D. Bredin, University of British Columbia, School of Kinesiology, 6108 Thunderbird Blvd, Vancouver, BC V6T 1Z3; telephone 604 822-8257; fax 604 822-9222; e-mail **shannon.bredin@ubc.ca**

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