



Physical activity RX: development and implementation of physical activity counselling and prescription learning objectives for Canadian medical school curriculum

Rx activité physique : développement et implantation d'objectifs d'apprentissage en matière de counseling et de prescription d'activité physique dans les cursus des facultés de médecine canadiennes

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Article abstract

Physical activity is an important component of health and well-being, and is effective in the prevention, management, and treatment of numerous non-communicable chronic diseases. Despite the known health benefits of physical activity in all populations, most Canadians do not meet physical activity recommendations. Physicians play a key role in assessing, counselling, and prescribing physical activity. Unfortunately, many barriers, including the lack of adequate education and training, prevent physicians from promoting this essential health behaviour. To support Canadian medical schools in physical activity curriculum development, a team of researchers, physicians, and exercise physiologists collaborated to develop a key set of learning objectives deemed essential to physician education in physical activity counselling and prescription. This commentary will review the newly developed Canadian Physical Activity Counselling Learning Objectives and give case examples of three Canadian medical schools that have implemented these learning objectives.

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Abstract

Physical activity is an important component of health and well-being, and is effective in the prevention, management, and treatment of numerous non-communicable chronic diseases. Despite the known health benefits of physical activity in all populations, most Canadians do not meet physical activity recommendations. Physicians play a key role in assessing, counselling, and prescribing physical activity. Unfortunately, many barriers, including the lack of adequate education and training, prevent physicians from promoting this essential health behaviour. To support Canadian medical schools in physical activity curriculum development, a team of researchers, physicians, and exercise physiologists collaborated to develop a key set of learning objectives deemed essential to physician education in physical activity counselling and prescription. This commentary will review the newly developed Canadian Physical Activity Counselling Learning Objectives and give case examples of three Canadian medical schools that have implemented these learning objectives.

Résumé

L'activité physique est une composante importante de la santé et du bien-être, et elle est efficace dans la prévention, la prise en charge et le traitement de nombreuses maladies chroniques non transmissibles. Malgré les bienfaits qu'on lui reconnaît pour la santé des populations, la plupart des Canadiens ne suivent pas les recommandations en matière d'exercice. Les médecins jouent un rôle clé dans l'évaluation, le counseling et la prescription de l'activité physique, mais de nombreux obstacles, dont le manque de formation adéquate, les empêchent de promouvoir cette habitude de vie essentielle pour la santé. Afin d'aider les facultés de médecine canadiennes dans l'élaboration de leur cursus sur l'activité physique, une équipe composée de chercheurs, de médecins et de physiologistes de l'exercice a collaboré à la définition d'un ensemble d'objectifs d'apprentissage jugés indispensables à la formation des médecins pour qu'ils puissent offrir des conseils sur l'activité physique et la prescrire. Ce commentaire passe en revue les nouveaux objectifs d'apprentissage en matière de counseling en activité physique et donne des exemples de cas de trois facultés de médecine canadiennes qui ont mis en œuvre ces objectifs d'apprentissage.

Introduction

In 2018, the Medical Council of Canada (administrators of the Medical Council of Canada Qualifying Examination, MCCQE) changed their evaluation criteria to include up to 20% disease prevention and health promotion content in the MCCQE, setting the requirement for graduating medical students to understand interventions that promote health and prevent disease at primary, secondary, and tertiary levels.^{1,2} Physical activity is a modifiable health behaviour that plays a significant role in the prevention and management of Canada's leading chronic diseases. It is currently estimated that 5.3 million deaths per year are due to inactivity, accounting for 9% of annual global deaths.³ If inactive people became active, it is estimated that 6% of the burden of disease worldwide due to coronary heart disease, 7% due to Type 2 diabetes, and 10% due to both breast and colon cancers could be eliminated.³ In fact, physical activity has often been referred to as the 'wonder drug', that if implemented widely, could prevent and manage substantial disease burden and contribute to significant health care savings. In Canada, the estimated direct and indirect cost of physical inactivity in 2009 was \$6.8 billion.⁴ Even just a 1% improvement in physical activity in Canada could save \$2 billion dollars per year by the year 2031.⁵

In 2020, the Canadian Society for Exercise Physiology published 24-Hour Movement Guidelines for Adults 18-64 Years and 65+ Years, adding to their existing 24-Hour Movement Guidelines for Children and Youth and the Early Years.⁶ These guidelines replace the previous Canadian Physical Activity Guidelines, and now include recommendations for physical activity, limiting sedentary time, and sleep. Despite previous Canadian Physical Activity Guidelines being widely available for many years prior to the release of these 24-Hour Movement Guidelines, only 13% of Canadians report having awareness of these guidelines, and only 16% report meeting the recommendations of 150 minutes of moderate to vigorous physical activity (MVPA) per week accumulated in bouts of 10 minutes or more.^{7,8} Relative to the new 24-Hour Movement Guidelines, only 49% of Canadians aged 18-79 accumulate at least 150 min of MVPA weekly.⁸ This demonstrates a significant translational 'valley of death' between the unwavering evidence for the benefits of physical activity and sustained activity levels. For an intervention that plays such a significant role in health promotion and chronic disease management, this is simply not acceptable.

The physicians' role in physical activity promotion

Physicians play a key role in assessing and prescribing health behaviours and offer a consistent and trusted opportunity to reinforce this important public health message to patients.^{10,11} Unfortunately, it is well known that physicians do a poor job of taking physical activity histories, providing activity recommendations, and supporting health behaviour change.² One of the key reported barriers to prescribing and counselling on physical activity is the lack of consistent training in medical education, leading to reduced confidence and prioritization of physical activity counselling in clinical practice.^{12,13} Including physical activity counselling and prescription training in medical education has the potential to improve understanding of the role and benefits of activity among future healthcare providers, while also reinforcing activity as an intervention these healthcare providers can and should promote to patients. Reinforcing the importance of this intervention in medical education will help to diminish the concerns around lack of understanding among physicians and will also help to strengthen the value physicians place on the role of physical activity in managing disease.

Physical activity in medical curriculum

In 2016, the Canadian Medical Association (CMA) suggested that Canadian medical schools should update their curricula to include physical activity prescription and referral to physical activity specialists.¹⁴ As this suggestion was not mandated, curricula updates were at the discretion of each institution and unfortunately, a lack of standard curriculum recommendations for Canadian medical schools remains.¹⁴ An informal survey of student representatives from each Canadian medical school, conducted by our group in 2019, found that of the 16 medical schools who responded, only 50% (8/16) reported any type of physical activity counselling curriculum.¹⁵ Of those eight schools, across all years of pre-clerkship medical education, representatives reported an average duration of only 130 minutes spent on physical activity counselling. Only 6/16 schools reported recollection of physical activity curriculum being examined, and alarmingly, none of the school representatives reported feeling competent in the material.¹⁶

As a group of researchers, exercise physiologists, and physicians across Canada, we developed a set of physical activity learning objectives for Canadian medical schools,

based on previously published objectives in the USA.¹⁶ The Physical Activity Counselling and Prescription Learning Objectives, outlined in Appendix A, were iteratively reviewed by experts in the area, including Physical Activity researchers, Clinical Exercise Physiologists, and Sport Medicine and Physical Medicine & Rehabilitation physicians. The objectives are meant to guide medical schools in the development of relevant curriculum, allowing for differences in curriculum delivery across the country. Examples of how these objectives have been implemented at the University of Calgary, Queen's University and the University of British Columbia are outlined in Appendix B.

The Physical Activity Counselling Learning Objectives were designed in two parts, including the *Core Curriculum*, and an *Expanded Curriculum*. The *Core Curriculum* was selected by the committee of experts as being essential to understanding the evidence supporting physical activity for chronic disease prevention and management, the role of the physician in assessment, prescription, and counselling, the updated movement guidelines, and effective behaviour change strategies. The *Expanded Curriculum* was designed to offer additional topics if there was available time and expertise in the curriculum. Some of the topics in the Expanded Curriculum, like 'Cardiopulmonary and Metabolic Responses to Physical Activity' may also be covered in other learning sessions, including the cardiology curriculum.

These learning objectives are meant to provide a starting point for medical schools across Canada, as they assess their current curricula and aim to meet the CMA recommendations to include physical activity counselling curriculum. They are also meant to best prepare medical students for the Medical Council of Canada MCCQE examination and clinical practice. As rates of chronic disease continue to rise, it is imperative that physicians implement physical activity assessment, prescription and behaviour change support in their clinical practice. Without adequate training in medical school, this is not achievable. Our hope is these objectives will be used to form the basis of strong physical activity curriculum development in Canadian medical schools.

Conflicts of Interest: Dr. Lauren C Capozzi is the co-founder of Thrive Health Services, offering training for fitness professionals who work with cancer survivors. Dr. Taniya S Nagpal is on the Exercise is Medicine National Advisory Council. Dr. Jennifer R Tomasone is on the Faculty Advisory for Exercise is Medicine Canada on Campus at Queen's University. Dr. Catherine A Gaul is the former Exercise Theme curriculum lead at UBC Faculty of Medicine. Dr. Jonathon R Fowles is the Chair of Exercise is Medicine National Advisory Council. All other authors have no conflicts of interest to declare.

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Appendix A. Physical activity learning objectives for undergraduate medical curriculum in Canada

Core curriculum:

Recommend 2-4 hours to address all core curriculum objectives.

This is meant to be an overview, with the aim to provide medical students with a framework for the role of physical activity, how to properly assess physical activity, and how to prescribe and/or refer to a qualified exercise professional.

- 1) Physician as a role model – impact of physician wellness and physical activity levels on patients
 - * Evidence for physicians who are more active, are more likely to discuss and prescribe physical activity for patients
- 2) Definitions – physical activity, exercise, and sedentary behaviour
- 3) Epidemiology of physical activity and sedentary behaviour
 - * Rates of physical activity and sedentary behaviour globally
 - * Impact of these modifiable risk factor on disease burden globally
- 4) Social, cultural, environmental, and health determinants of physical activity and sedentary behaviour
- 5) Health benefits of physical activity
 - * Physical
 - * Psychosocial
- 6) Health risks of sedentary lifestyle and physical inactivity
 - * Why this is different from benefits of physical activity
- 7) Risks of physical activity
 - * Rates of injury
 - * Rates of death
- 8) Physical activity guidelines for the general population
 - * 24-Hour Movement Guidelines for Early Years, Children and Youth, and Adults 18-64 Years and 65+ Years through the Canadian Society for Exercise Physiology (CSEP).
- 9) Physical activity guidelines and modifications for clinical and special populations. Highlight select cases and provide resources for others.
 - * Select cases can include physical activity guidelines for people with cardiovascular disease, diabetes, cancer, obesity, pregnancy, osteoarthritis, spinal cord injury.
- 10) Components of a physical activity history
 - * Using FITT principle and physical activity as a Vital Sign
- 11) Preparticipation screening guidelines (i.e., risk assessment)
 - * Review available questionnaires
 - * Contraindications to exercise
- 12) Components of a physical activity prescription

- * Using the FITT principle as it relates to the physical activity guidelines
 - * Assessing current physical activity and fitness levels
 - * Tailoring physical activity prescription for special populations
- 13) Behaviour change for physical activity adoption, adherence, and maintenance, in addition to reducing sedentary behaviour
- * Assessing readiness for change and appropriate interventions tailored to each patient
 - * Assessing barriers to physical activity and developing patient-centered goal setting
- 14) Understanding physical activity Health Professionals and Community Resources
- * CSEP Clinical Exercise Physiologist, CSEP Certified Personal Trainer, Kinesiologist, other allied exercise and health professionals

Expanded curriculum:

Additional to core curriculum objectives, and possibly covered in other course materials.

- 1) Exercise physiology
- 2) Structure and function of skeletal muscle
- 3) Cardiopulmonary and metabolic responses to physical activity
- 4) Principles of exercise training
 - * Address seven principles of exercise training: Individuality, specificity, progression, overload, adaptation, recovery, reversibility
- 5) Optimizing exercise performance
- 6) Cultural competencies as it relates to physical activity
- 7) Effective exercise counselling: Motivational interviewing, psychosocial determinants of physical activity, sensitivity training to address health behaviours among marginalized population, eliminating stigma within healthcare settings (e.g., weight stigma)

Appendix B. Spotlight on implementation in three Canadian Medical Schools

Case example one: University of Calgary

Starting in 2019, the University of Calgary adopted a 2-hour 'Flipped Classroom' curriculum consisting of a podcast and an in-person workshop to deliver physical activity education for all first-year medical students. The 2-hour curriculum is included in Course 2: Musculoskeletal and Dermatology, and consists of:

1. A 1-hour podcast lecture covering the core curriculum objectives in Appendix A. This is delivered by a Sport and Exercise Medicine Physician as well as a Clinical Exercise Physiologist and faculty member (PhD) with expertise in exercise behaviour change who is also a resident physician in Physical Medicine & Rehabilitation. The one-hour podcast also highlights evidence for exercise and recommendations for five special populations, including patients with obesity, hypertension, pregnancy, cancer, and osteoarthritis. To facilitate behaviour change, students were taught the 5A's model of physical activity assessment and prescription including Assess, Advise, Agree, Assist and Arrange. Students watched the 1-hour podcast ahead of the in-person classroom workshop.
2. A 1-hour in-person workshop where students worked in small groups to review clinical cases, addressing questions around physical activity assessment, prescription, modifications for the general population and for special populations, including children and youth, and patients with hypertension, obesity, cancer, osteoarthritis, and who are pregnant. Cases also examined behavioural counseling techniques. Approximately 14 facilitators were present to support small group learning as students worked on the cases. Facilitators had backgrounds in medicine (i.e. sports medicine physicians or residents), research (i.e. PhD in Kinesiology), or were Clinical Exercise Physiologists. The students had approximately 35 minutes to work on the clinical cases together, followed by a class discussion.

Students report the learning event is valuable in introducing the role of physical activity and offers time to practice practical application of the learning objectives during the workshop. Students also valued the opportunity to learn from a variety of health care providers, including sports medicine physicians, physical activity researchers, and clinical exercise physiologists (unpublished data).

Case example two: Queen's University

Since 2016, the School of Medicine at Queen's University has adopted a multi-year approach to introducing physical activity topics into the undergraduate curriculum, as follows:

1. 2.5 hours as part of the Population Health course for all first-year medical students. This content is delivered by a non-clinical faculty member (PhD) with expertise in exercise behaviour change and movement guideline implementation.
 - a. A 1-hour, self-directed learning event covering the core curriculum objectives in Appendix A. Students watch a lecture-recording and are provided access to movement guidelines and resources; and
 - b. A 1.5-hour seminar where students work in small groups to discuss movement behaviour readiness and assessment, behaviour change, prescription, and referral to health professionals and community resources. The case studies build in complexity halfway through the seminar. Students work in their groups for 20 minutes twice, with time for class discussion in between and at the end.
2. 3.5 hour workshop as part of the Endocrinology block for all second-year medical students. This content is co-delivered between a clinician-faculty member (MD) and a Health Promotion graduate student with experience teaching motivational interviewing. The workshop content was designed with input from the non-clinical faculty member (PhD) who facilitates the year 1 learning events and the Exercise is Medicine Canada on Campus student group. The curriculum for this workshop reinforces the core curriculum objectives in Appendix A and focuses on skill building for effective exercise counselling (i.e., expanded curriculum objective 7).
 - a. A 45-minute introductory lecture about motivational interviewing for physical activity counselling;

- b. 2-hours of small-group experiential learning split into three blocks. Each block includes paired practice, video review and group discussions about several complex clinical case studies.
- c. A 45-minute summary, consolidation and debrief.

Students report the learning event to be of high quality, and significant increases in self-reported motivational interviewing knowledge in the context of physical activity counselling have been observed from pre- to post-workshop. Full details about the second-year content and evaluation are published.¹⁷

Case example three: University of British Columbia

Starting in 2016, the physical activity curriculum at the University of British Columbia Faculty of Medicine has been enhanced in the following ways:

1. One 3-hour introductory workshop on exercise prescription in the first semester of first year. This content is delivered by family physicians to groups of 8 students and covers the basics of the core curriculum objectives as applied to the general population, with opportunities to try the process of creating an exercise prescription.
2. Three 50-minute lectures, two in first year which cover a) exercise physiology with a focus on diabetes prevention and management, and b) the importance of physical activity to a healthy pregnancy, and one in second year which covers the physician's role in supporting physical activity. In addition, physical activity content is integrated into lectures on related prevention and chronic condition topics.
3. Integration of the core curriculum objectives (Appendix A) and the principles of motivational interviewing (and other behaviour change counselling tools) into small-group case-based learning sessions in 20% (11/56) of pre-clerkship curricular weeks. These small-group sessions allow students to practice prescription skills and discuss each unique patient with guidance from their small-group tutor. Cases include detailed background information to assist tutors who are not content experts. Weeks were chosen based on the relevance and importance of physical activity to their primary topic and include hypertension, Type 2 diabetes, pregnancy, depression, child/adolescent development, chronic heart disease and osteoarthritis. Patients increase in medical and psychosocial complexity throughout the two pre-clerkship years as students gain confidence in their knowledge and skills.
4. Two additional practice cases, one focused on prevention and one on chronic disease management, are included with the Family Medicine clerkship block resources (Year 3).

Initial feedback from students, small-group tutors and curriculum leadership has been very positive. Students were very appreciative of the opportunity to learn about physical activity prescription, particularly as it applies to each chronic condition. Further evaluation of the new curriculum is pending.