



■ Review Article

# Overview of Physical Activity Counseling in Primary Care

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Physical inactivity is a global health burden. Promoting physical activity in primary care through physical activity counseling is an effective intervention. This article provides an overview of and perspectives on physical activity counseling in primary care. The identification of physical inactivity as a health problem may increase the awareness of physical inactivity among patients and primary care providers, which will lead to an action plan. The contents of physical activity counseling should be based on evidence-based recommendations. Safety issues should be evaluated appropriately to optimize the utilization of primary care services. Physical activity counseling methods should be “tailored” for an individual using appropriate counseling methods and setting-specific resources. Multi-level barriers to physical activity counseling in primary care (i.e., healthcare providers, patients, and systems) must be addressed. Setting-specific strategies to overcome these barriers should be implemented to maximize the effectiveness of physical activity counseling in primary care.

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## INTRODUCTION

Physical inactivity or insufficient physical activity is a global health issue. According to the Global Burden of Disease Study 2017, physical inactivity caused more than 1 million deaths, and the mortality rate increased 22% compared with that documented in 2007.<sup>1)</sup> Physical inactivity is also a proxy of deaths caused by major non-communicable diseases (NCDs) and cancers, such as ischemic heart disease, ischemic stroke, type-2 diabetes mellitus, as well as cancer of the colon, rectum, and breast.<sup>1)</sup> The pandemic of physical inactivity contributes to billions of dollars in direct and indirect economic losses.<sup>2)</sup> The World Health Organization launched the Global Action Plan on Physical Activity and Health 2018–2030, which aims to reduce global physical inactivity by 15% by 2030.<sup>3)</sup> One of the policy actions is to incorporate physical activity into health services and social services.<sup>3)</sup>

Primary care systems have several effects on population health: better accessibility and quality of care; reduction in unnecessary specialty care; early management of health problems; health promotion; and disease prevention.<sup>4-6)</sup> Recent studies have suggested that increasing the number of physicians in primary care can increase life expectancy and reduce the prevalence of death due to cardiovascular-, cancer-, and respiratory-related diseases in the population.<sup>7)</sup> These specific characteristics of primary care provide opportunities to implement diverse healthcare services to improve the health of a population. Specifically, promoting physical activity in primary care is an effective approach to reducing physical inactivity among patients.<sup>8,9)</sup>

Promoting physical activity in primary care can convert one out of 12 sedentary people to become physically active.<sup>8)</sup> Compared with advice for smoking cessation, physical activity counseling (PAC) is a more efficacious intervention to change the behavior of patients.<sup>8,10)</sup>

“Physical activity” can be defined as any bodily movement produced by skeletal muscles that results in energy expenditure, which includes physical activity during work, traveling, and leisure time.<sup>11,12)</sup> “Exercise” is a subset (and possibly an interchangeable term) of physical activity.<sup>11)</sup> Therefore, “promoting exercise” is also a common term used in healthcare services. For example, “Exercise is medicine” is a well-known global campaign that encourages healthcare professionals to promote physical activity in their patients.<sup>13)</sup> The concept of “exercise is medicine” has been recognized for centuries.<sup>14,15)</sup> Using exercise to treat diseases is based on scientific evidence.<sup>16)</sup>

PAC is a component of promoting physical activity in primary care. Stoutenberg et al.<sup>17)</sup> created a comprehensive three-step framework to promote physical activity: (1) assessment of physical activity; (2) PAC; and (3) referral to experts. Physicians in primary care can play an important part as counsellors in physical activity.<sup>18,19)</sup> However, physician-, patient-, and system-based barriers to PAC in primary care have been documented.<sup>20-23)</sup> Moreover, various primary care services contribute to different PAC practices. For example, PAC can be conducted solely by physicians or allied health professionals, or in combination.

A single standard of PAC practice in primary care is lacking. A “tailored” practice for a particular setting is necessary. This article pro-

vides an overview of and perspectives on PAC in primary care.

## IDENTIFYING PHYSICAL INACTIVITY AS A HEALTH PROBLEM

According to a global analysis from 2001 to 2016, the prevalence of physical inactivity was 27.5%, and it was higher among high-income countries (36.8%) than in low-income countries (16.2%).<sup>24)</sup> Physical inactivity is considered one of the determinants of health problems and can lead to chronic diseases.<sup>25)</sup> The elimination of physical inactivity can significantly lower the risk of all-cause mortality;<sup>26,27)</sup> NCDs and cancers;<sup>28)</sup> and cancer recurrence among cancer survivors.<sup>29,30)</sup>

“Physical inactivity” can be defined as “performing insufficient amounts of moderate- and vigorous-intensity activity” or “an insufficient physical activity level to meet present physical activity recommendations.”<sup>31,32)</sup> Global recommendations on physical activity for health state that adults should participate in at least 150 minutes per week of moderate-intensity or at least 75 minutes per week of vigorous-intensity, or an equivalent combination of moderate- and vigorous-intensity aerobic physical activity.<sup>33,34)</sup> Physical inactivity is generally considered based on the level of recommended aerobic physical activity.<sup>35-38)</sup> However, several national-level surveys have also used the recommendation for muscle strengthening at least 2 days a week to measure physical activity.<sup>39-41)</sup>

In primary care, a recommended aerobic level is considered as a cut-off point between being “physically inactive” and “physically active.” According to “exercise is medicine” guidelines, the “dose” of physical activity can be assessed based on two questions: (1) “on average, how many days per week do you engage in moderate-to-strenuous (vigorous) exercise?”; and (2) “on average, how many minutes do you engage in exercise at this level?”<sup>42)</sup> The result of these two screening questions provides the total minimum per week of an equivalent combination of moderate- and vigorous-intensity aerobic physical activity. One example can be a person who participates in 30 minutes per week of moderate-intensity and 30 minutes per week of vigorous-intensity aerobic physical activity (1-minute energy expenditure of vigorous-intensity activity is equal to 2 minutes of moderate-intensity activity). Therefore, the total number of minutes per week is: 30+(30×2)=90 minutes per week of an equivalent combination of moderate- and vigorous-intensity aerobic physical activity, which would classify this person as “physically inactive.”

Listing physical inactivity as a health problem could increase the awareness of primary care providers. Creating a list of active and current/previous diagnoses relevant to patient care<sup>43)</sup> could encourage physicians to make decisions based on holistic concepts.<sup>44)</sup> Electronic medical record (EMR) systems are used commonly in primary care. The incorporation of physical inactivity as an active health concern into the “problem list” of the EMR could aid the continuity of care among providers. This approach could help physicians to think holistically about their patients and to ensure that minor problems are less likely to be forgotten. Based on the International Statistical Classifica-

tion of Diseases and Related Health Problems, 10th revision (2016), the code “Z72.3 Lack of physical exercise” can be used to identify physical inactivity.<sup>45)</sup>

## ORGANIZING PHYSICAL ACTIVITY COUNSELING IN PRIMARY CARE

PAC requires specific knowledge and skills. In addition, it should be tailored for each individual and each primary care setting. The sections below detail essential considerations to adapt for primary care. PAC for specific diseases is beyond the scope of this article.

### 1. Recommendations on Physical Activity for Health

A time-based recommendation for physical activity has been used widely. That is, 150 minutes per week of moderate-intensity or 75 minutes per week of vigorous-intensity aerobic physical activity is set as an indicator for “being physically active.” This time-based indicator has been cited in research,<sup>37,38,46,47)</sup> wearable devices,<sup>48,49)</sup> public health,<sup>50-53)</sup> and clinical services as well as in primary care.<sup>54-56)</sup> Kyu et al.<sup>28)</sup> detailed the dose-response effects of a higher level of physical activity on risk reduction of NCDs and cancers. Moreover, the global recommendations suggest physical activity for 2 or more days per week that strengthens the major muscle groups.<sup>33,34)</sup> In addition, balance training for 3 or more days per week is recommended for people aged 65 years and above to prevent falls.<sup>33,34)</sup>

There are some changes in the recent guideline. The Physical Activity Guidelines for Americans (second edition) recommend that “adults should do at least 150 minutes to 300 minutes a week of moderate-intensity, or 75 minutes to 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity.”<sup>57)</sup> They also recommend moderate- or greater-intensity of muscle-strengthening activities that involve all major muscle groups at least two days a week.<sup>57)</sup>

These guidelines also include recommendations for different age groups and health conditions.<sup>57)</sup> Older adults should also include balance exercises.<sup>57)</sup> Older adults who cannot undertake 150 minutes a week of moderate-intensity aerobic physical activity should be as active as their conditions and abilities allow.<sup>57)</sup> Women, during pregnancy and the postpartum period, should do at least 150 minutes a week of moderate-intensity aerobic activity.<sup>57)</sup> Individuals living with an illness or a specific condition may need the supervision of healthcare providers. For example, pregnant women have different contraindications to physical activity than that of the general population.<sup>58)</sup>

A step-based recommendation for physical activity is an alternative approach. Walking 10,000 steps every day is recommended to reduce health risks and improve metabolic outcomes.<sup>59,60)</sup> For adults, walking 10,000 steps every day is equivalent to approximately 8 km, can be achieved with an active lifestyle that includes walking for 30 minutes per day, and consumes 300–400 calories.<sup>59,60)</sup> Walking can be categorized based on the number of steps walked per day: 5,000–7,400 is “low active”; 7,500–9,999 is “somewhat active”; 10,000 or more is “active”;

and more than 12,500 is “highly active.”<sup>61)</sup> A walking pace or cadence threshold of 100 steps per minute (comparable with moderate-intensity physical activity) to 130 steps per minute (comparable with vigorous-intensity physical activity) is recommended among adults.<sup>62,63)</sup>

### 2. Health Screening before Undertaking Physical Exercise

Physical activity and exercise can increase injury risks, from musculoskeletal injuries to sudden cardiac arrest.<sup>64-66)</sup> However, the prevalence of injury is low and most injuries are minor.<sup>67)</sup> Studies have reported the incidence of exercise-related sudden cardiac arrest to range from 0.6 to 2.1 per 100,000 person-years.<sup>68-70)</sup> Compared with the incidence of out-of-hospital cardiac arrest, the incidence is 65.4 per 100,000 person-years among Asian countries and 108.9 per 100,000 person-years in the Australia continent.<sup>71)</sup> Accordingly, the incidence of exercise-related sudden cardiac arrest is relatively low. Studies have suggested that individuals with habitual physical activity carry a low risk of myocardial infarction and sudden cardiac death at baseline and during episodic physical activity.<sup>72,73)</sup> This means that episodic heavy physical activity can increase the risk of serious cardiac events; however, regular physical activity can reduce the risk of those events in the long-term.

To avoid the risks of injuries and fatal cardiac events, health screening before undertaking physical exercise may be necessary for some people. A well-known preparticipation health-screening tool is the Physical Activity Readiness Questionnaire (PAR-Q) and You, which consists of seven simple questions to appraise one’s ability to become more physically active. One or more positive answers on the PAR-Q requires that a physician be consulted for a physical activity clearance.<sup>74)</sup> This approach can lead to an excessive number of physician visits. Physicians can use the Physical Activity Readiness Medical Examination (PARmed-X) to address medical concerns about participation in physical activity.<sup>74)</sup>

New tools based on evidence-based consensus are being developed to support the preparticipation screening for physical activity.<sup>75)</sup> Physical Activity Readiness for Everyone (PAR-Q+) and the electronic Physical Activity Readiness Medical Examination (ePARmed-X+) can be used as self-screening tools and are applicable to people of all ages with or without chronic medical conditions.<sup>74)</sup> These new tools could reduce the excessive number of physician visits for clearance for physical activity.

The preparticipation health-screening process set by the American College of Sports Medicine in 2015 is another example. This guideline aims to reduce the excessive number of physician referrals, while exercise is safe for most people.<sup>76)</sup> The guideline provides a “decision tree” for health screening before exercise participation based on three factors: (1) the individual’s current level of physical activity; (2) signs or symptoms and/or known cardiovascular, metabolic, or renal disease; and (3) desired exercise intensity.<sup>76,77)</sup> A non-regular exerciser without cardiovascular, metabolic, or renal disease can start light- to moderate-intensity exercise without medical clearance.<sup>76)</sup> A person with symptomatic diseases may need medical clearance before participating in

exercise.<sup>76)</sup> Regular exercisers (defined as three or more sessions per week of 30-minute moderate-intensity exercise) without signs, symptoms, or evidence of cardiovascular, metabolic or renal disease do not need medical clearance and can continue moderate- to vigorous-intensity exercise.<sup>76)</sup> In addition, primary care providers must detect contraindications to physical activity and safety precautions for each individual. Further tests and specialist consultations may be required for some people with chronic or unstable conditions.

**3. Physical Activity Counseling Methods**

PAC methods vary according to theories, interventions, and providers. The term PAC is used interchangeably with “physical activity consultation.” A systematic review on the content and competency of PAC by Breckon and colleagues revealed diverse theories and interventions, such as the transtheoretical model, social cognitive theory, brief negotiation, and motivational interviewing.<sup>78)</sup>

The 5As (Assess, Advise, Agree, Assist, and Arrange) framework is another commonly used method to counsel about physical activity.<sup>79,80)</sup> This framework comprises the following: “Assess” physical activity levels; “Advise” on increasing physical activity; “Agree” on a tailored plan for physical activity; “Assist” to meet physical activity goals by providing pertinent strategies; and “Arrange” reminders and follow-ups.

These processes require topic-based knowledge and communication skills. Primary care providers advise their patients to participate in physical activity based on the recommendations for physical activity, but 150 minutes per week of moderate-intensity aerobic physical activity is the general information provided. According to the transtheoretical model (stages of change), this information may be sufficient for a physically active person who is at the action or maintenance stage but must be translated and placed in an action plan for those in pre-contemplation, contemplation, or preparation stages.<sup>81)</sup>

The frequency, intensity, time, and type (FITT) principle is used

widely for PAC.<sup>82)</sup> The challenge is to fulfill the content of each component.

Frequency represents the number of sessions of physical activity or exercise per week. According to the guidelines for adults, aerobic activities should be spread throughout the week so that at least 150–300 minutes per week of moderate-intensity physical activity is accumulated.<sup>57)</sup> O’Donovan et al.<sup>83)</sup> showed that participating in all leisure-time physical activity on one or two sessions per week may be sufficient to reduce the mortality risk. However, primary care providers can base their decisions on specific-age guidelines and personal readiness or abilities.

Intensity is the rate of energy expenditure (i.e., how hard a person works to carry out an activity). Most guidelines focus on moderate- to vigorous-intensity activity. The intensity of physical activity is vital for discussions of participation in physical activity. Nevertheless, this component is, sometimes, neglected by counselors.<sup>23)</sup> There are several ways to identify the intensity of physical activity (Table 1).<sup>31,41,57,84,85)</sup>

Time refers to the duration of an activity session. Previously, the guidelines suggested a 10-minute bout of aerobic physical activity.<sup>33,34)</sup> However, to achieve the weekly goal and health benefits, the recent guideline recommends that any duration of moderate- to vigorous-intensity physical activity can be accumulated as the total volume of physical activity.<sup>57)</sup>

The type of physical activity is defined by the characteristics and goals of the activity. Table 2 presents the major types of physical activity that should be acknowledged in primary care.<sup>57)</sup>

The FITT principle is emphasized to target the epidemic of physical inactivity. However, the enjoyment of individuals should be considered as an additional component to overwhelm the high prevalence of physical inactivity.<sup>86)</sup>

**4. Follow-up and Referral Schemes**

In primary care, PAC can be conducted solely by physicians or allied

**Table 1.** Intensity of physical activity

Intensity	Aerobic activity			Muscle-strengthening activity
	%HR <sub>max</sub>	Talk test (comfortable conversation)	Compendium of physical activities	
Sedentary	<50	Possible	≤1.5 METs - Sitting, playing traditional video game, computer game (1 MET)	
Light	50–63	Possible	<3 METs - Watering plants (2.5 METs) - Walking to and from an outhouse (2.5 METs)	40%–50% of 1 RM
Moderate	64–76	Possible	3–5.9 METs - Walking a dog (3 METs) - Walking at 3.5 mph briskly on a firm surface (4.3 METs)	60%–70% of 1 RM
Vigorous	77–93	Not likely possible	6–8.8 METs - Race walking (6.5 METs) - Walking at 4.0 mph very briskly on a level, firm surface (6.8 METs) - Jogging (general) (7.0 METs)	≥80% of 1 RM
Very hard to maximum	>93	Not possible	≥8.8 METs - Running a marathon (13.3 METs)	

The compendium of physical activities is a list of physical activities quantifying the energy cost as MET values (1 MET=3.5 mL/kg/min of oxygen uptake). %HR<sub>max</sub>, percent of maximum heart rate (HR<sub>max</sub>=220–age); MET, metabolic equivalent; 1 RM, one-time repetition maximum (the heaviest weight a person can lift once).

**Table 2.** Types of physical activity

Type	Explanation
Aerobic activity	Uses the large muscles for a sustained amount of time to improve cardiorespiratory fitness (also called "endurance" or "cardio activity").
Muscle-strengthening activity	Increases the strength, power, endurance, and mass of skeletal muscles.
Bone-strengthening activity	Creates a force on bones, which stimulates their strength and growth.
Balance activity	Improves the ability to resist forces that cause falls.
Multicomponent physical activity	Combines more than one type of physical activity (i.e., aerobic, muscle-strengthening, and balance).

health professionals, or in combination. Physician-only counseling can be completed in a single consultation. Nonetheless, there is no guarantee that patients will change their behavior. A multidisciplinary approach could utilize the credibility of primary care physicians and their underlying relationship with their patients for PAC and offer referrals to allied health professionals for specialized management.<sup>87)</sup> For example, nurse practitioners can administer physical activity screening, primary care physicians can counsel or write a physical activity prescription for the patient, exercise specialists can create an individualized plan, and behavioral counselors can follow up and refer the patient to local physical activity resources.<sup>54)</sup>

Moreover, exercise-referral schemes have been implemented to achieve higher yields on physical activity participation. In the United Kingdom, for example, exercise-referral schemes have been enacted in primary care since the 1990s for supervised exercise conducted in non-clinical environments or public leisure facilities.<sup>88,89)</sup> Several factors must be considered when deciding an appropriate scheme in a particular setting of primary care. A systematic review and meta-analysis by Williams et al.<sup>89)</sup> showed that exercise-referral schemes have a small effect on increasing physical activity in sedentary people (relative risk=1.20 and number needed to treat=17.2). Another systematic review showed that producing better health outcomes and higher adherence to physical activity required a scheme of longer duration (at least 20 weeks, compared with 8–12-week schemes).<sup>88)</sup> In addition, the cost-effectiveness of exercise-referral schemes should be appraised.<sup>90)</sup>

## BARRIERS TO PHYSICAL ACTIVITY COUNSELING

### 1. Healthcare Providers

Lack of knowledge or training in PAC can be a barrier. Training in PAC is sparse in undergraduate medical education and postgraduate primary care training.<sup>47,91,92)</sup> Other personal aspects can be barriers to physical activity; for example, unsuccessful efforts to change the behavior and attitude of patients (e.g., PAC is not a priority and lifestyle is a personal choice).<sup>20)</sup>

### 2. Patients

Insufficient time, resources, and social support are regarded as patient-based barriers.<sup>54)</sup> A low level of literacy and poor ability to understand

information are limitations to PAC.<sup>23)</sup> The patient's attitude regarding the importance and expectation of drug treatment rather than lifestyle modification can be a barrier to PAC.<sup>20)</sup>

### 3. Systemic

Time constraints are a major barrier to PAC, as documented by studies in various settings.<sup>20,23)</sup> Specifically, the duration of consultation in primary care varies from 48 seconds in Bangladesh to 22.5 minutes in Sweden.<sup>93)</sup> Hence, the implementation of an appropriate proportion of PAC in the primary care consultation is difficult. Lack of protocols and financial incentive/reimbursement for PAC are systemic barriers.<sup>20,54)</sup> Organizational barriers (e.g., discontinuation of primary care) can lead to failure in changing the behavior of the patient.<sup>23)</sup> For example, a patient who does not see the same physician regularly may not connect with his/her previous PAC.

## APPROACHES TO OVERCOMING BARRIERS

To overcome the barriers to PAC, different approaches in primary care are necessary. Primary care providers should be trained to counsel about physical activity. Training in physical activity is associated with greater confidence in discussing physical activity and exercise with patients.<sup>94)</sup> One-day training as continuing professional development can increase the confidence, knowledge, and counseling behavior of physicians.<sup>95)</sup>

Communicating with patients to change their behavior is a challenging task. Primary care providers should give tailored information to patients. Writing a prescription for physical activity or exercise can improve and facilitate PAC and increase the levels of physical activity.<sup>96,97)</sup> For patients with limited health literacy, primary care providers should focus on a communication strategy for each person, such as patient-centered communication, clear health communication, confirmation of understanding, and using communication technologies.<sup>98)</sup>

At organizational and policy levels, primary care settings should focus on physical activity and healthy lifestyles as part of organizational culture. For example, the UK campaign "making every contact count" encourages healthcare providers to maximize the opportunity within routine healthcare interactions for a brief discussion on health and wellbeing.<sup>99)</sup> Primary care settings can play a role as a health-promoting hub. In Korea, for example, the additional brief counseling after a periodic health examination is an effective intervention to increase physical activity.<sup>100)</sup> An individual with a high health risk appraisal score is invited to receive the additional brief counseling led by a primary care physician.<sup>100)</sup> Team-based care may help deal with a limited consultation time with the physician. A financial incentive for healthcare systems and healthcare providers to promote healthy lifestyles could help to lower the incidence of chronic diseases.<sup>101)</sup> Most importantly, system-based interventions could overcome organizational barriers, such as assigning the patient to see a physician regularly.

## CONCLUSION

PAC in primary care is a practical intervention to deal with the pandemic of physical inactivity and NCDs. Physical inactivity should be addressed as a health problem to increase awareness among patients and primary care providers, which should lead to an action plan. PAC contents should be evidence-based and tailored for an individual using appropriate counseling methods and setting-specific resources. The primary care setting should identify the barriers to PAC (health-care providers, patients, systemic). Moreover, strategies to overcome such barriers should be implemented.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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