

Cardiovascular fitness program design: Get off the couch!

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Introduction

"Get Off the Couch" (GOTC) is an eight-week cardiovascular health/wellness training program targeting sedentary (otherwise generally healthy) novice and beginners who want start (or increase current levels) physical activity (PA) in order to improve their quality of life (e.g. mobility, fat-loss, healthy socialization, goal-oriented). GOTC takes a mind-body-spirit approach to address whole-person wellness by incorporating behavioral change (BC) and motivational strategies. The goals of the GOTC program are: to "ease" an otherwise sedentary individual into regular PA; to equip an individual with motivational and coping life/behavioral skills in order to give them internal tools to work with to progress beyond GOTC and to curb backsliding; and to establish a mind-body-spirit connection to help the individual find a way for PA to be a meaningful element in their life.

Pre-Screening

All GOTC participants will be pre-screened according to the American College of Sports Medicine's (ACSM) general guidelines by administering the Physical Activity Readiness Questionnaire (PAR-Q) and the American Heart Association (AHA)/ACSM Health/Fitness Facility Pre-participation Screening Questionnaire (Pescatello, Arena, Riebe, & Thompson, 2014). The Physical Activity Stages of Change Questionnaire will also be administered, and GOTC participants will be interviewed to ensure that all individuals are mentally, emotionally, and behaviorally ready to begin PA (Marcus & Forsyth, 2009; Skaal, 2013). Participants should be ending stage 2 (pre-contemplation) and/or be in stage 3 (contemplation) of Prochaska and DiClemente's Transtheoretical Model (Marcus & Forsyth, 2009). For long-term success

(compliance and adherence), it is important to deliver physical activity programming and health information that is suitable or relevant to a person's stage of change (Marcus & Forsyth, 2009).

Acute Training Variables

Acute training variables relative to the GOTC cardiovascular health improvement program are exercise intensity, frequency, duration, and exercise modality. The eight-week program will be divided into two-week periods or quarters (e.g. the first two weeks make up the first quarter). Each quarter will have different challenges pertaining to the acute training variables.

Exercise Intensity

Using the counting talk test (CTT), GOTC participants will establish a baseline, CTT_{rest} (Loose et al., 2012). During activity, the participants' count (CTT_{active}) will be expressed as % CTT_{rest} (Loose et al., 2012). The ventilatory threshold (VT) where participants start to "suck air" and find it near impossible to talk will also be used as a quick gauge of intensity (Quinn & Coons, 2011; Rodriguez-Marroyo, Villa, Garcia-Lopez, & Foster, 2013). "Difficulty talking" correlates to about 90% of VO_{2max} ; "moderately difficult to talk, but still able to respond" correlates to about 75% of VO_{2max} ; and "comfortably talking" would indicate effort below 75% of VO_{2max} (Quinn & Coons, 2011).

ACSM's recommendations on exercise intensity are based on the percentage of oxygen uptake reserve ($VO_2 R$). Light exercise ranges from 30-40% of $VO_2 R$; moderate exercise ranges from 40-60% of $VO_2 R$; and vigorous exercise ranges from 60-90% of $VO_2 R$ (Pescatello et al., 2014). Despite some controversy over threshold versus maximal exercise intensity prescriptions, both % VO_{2max} and % $VO_2 R$ have their place, and the approximation using VT and CTT with sedentary participants is acceptable (Mann, Lamberts, & Lambert, 2013).

During the GOTC orientation, exercise intensity will be explained to the participants. Participants will experience first-hand what their bodies should be "feeling" at the different intensity levels. During the first quarter (first 2 weeks) of the GOTC program, participants will be aiming for the "comfortably talking" intensity as per ACSM's recommendations for deconditioned/sedentary individuals (Pescatello et al., 2014). During the second and third quarter, participants should aim for the "moderately difficult to talk" intensity. For the final quarter, participants will alternate between "moderate difficulty" and "difficult to talk intensities" with the expectation that after 6 weeks of groundwork, limited exposure to higher physiological demands will create even more self-efficacy and inspire them to pursue performance challenges beyond the GOTC program.

Frequency

The ACSM recommends moderate intensity cardiovascular exercise for at least 5 days per week or vigorous intensity cardiovascular exercise for at least 3 days per week (Pescatello et al., 2014). A combination of moderate and vigorous exercise is also acceptable with the minimum goal of 3-5 days per week (Pescatello et al., 2014).

The GOTC program minimum goals per quarter are: first quarter, low to moderate intensity exercise for 2 days per week; second quarter, moderate intensity exercise for 3 days per week; third quarter, moderate intensity exercise for 5 days per week; and fourth quarter, 3 days of moderate intensity plus 1 day of vigorous intensity exercise per week. Instead of overwhelming individuals who are already prone towards being sedentary, GOTC's goal is to empower the individuals to embrace regular PA and make it a habit for themselves.

Duration

The ACSM recommends 30-60 minutes per day (at least 150 minutes per week) of moderate intensity exercise, or 20-60 minutes per day (at least 75 minutes per week) of vigorous exercise (Pescatello et al., 2014). Intermittent (accumulated) exercise is also valuable to positive physiological adaptations with a minimum bout of 10 minutes (Campbell, Wallman, & Green, 2010; Pescatello et al., 2014).

The GOTC program encourages participants to aim for at least 30 minutes per day (or two, 15-minute sessions per day) from the first to third quarters. Priority is placed on adherence to regularity and the length of a bout (e.g. start with two, 15-minute sessions per day, but later aim for one continuous 30-minute session). In the fourth quarter, GOTC participants should aim for at least 20 minutes per day at the higher intensity level.

Exercise Modality

The GOTC program aims to be accessible to a wide variety of people from varying backgrounds. GOTC programming needs to be creative, interesting, enjoyable, doable, non-intimidating, flexible/adaptable (progress and regress skill levels), low-cost and at the same time impactful—"biggest bang for the dollar".

Walking. Studies have shown that walking is a highly accessible and effective form of physical activity improving overall fitness with positive adaptations including fat mass reduction, blood pressure control, mood augmentation, cardiovascular disease (CVD) prevention, metabolic syndrome (METs) prevention, insulin resistance, plasma adiponectin, maximal oxygen uptake (VO_{2max}), and total cholesterol (Di Blasio et al., 2014; Hanson & Jones, 2015).

Based on ACSM's recommendation, 30 minutes of moderate intensity walking would equate to roughly 3,100-4,000 steps (Pillay, Kolbe-Alexander, van Mechelen, & Lambert,

2014a). Studies have linked the old adage "10,000 steps a day" (e.g. 10,000 Steps Rockhampton) to individuals classified as "normal" weight (healthy adults acquire about 7,000-13,000 steps/day), and people who accumulated less than 5,000 steps/day tended to be overweight/obese (Brown, Mummery, Eakin, & Schofield, 2006; Pillay et al., 2014a; Pillay, Kolbe-Alexander, Proper, van Mechelen, & Lambert, 2014b). However, relatively healthy adults range anywhere from 7,000-13,000 steps/day (Pillay et al., 2014b).

The quality (intensity) of steps matter as well—the minimum pace for physical activity should be 60 steps/min, and moderate-high intensity stepping should range from 96-110 steps/min (Pillay et al., 2014a). Pillay et al. (2014a) found that individuals accumulating at least 5,000 steps/day at 60 steps/min benefitted by having lower percentage body fat, smaller waist circumferences, and greater maximal oxygen uptake (VO_{2max}) as compared to individuals acquiring less than 5,000 steps/day.

For sedentary individuals just beginning to increase their PA levels, the "10,000 steps per day" adage would be discouraging. However, a simpler goal would be aim for pace of 1000 steps/10-minutes (equating to 3000 steps/30-minute) (Pillay et al., 2014b). Regardless of individual "steps per day" outcomes, the GOTC program will educate participants on the value of the pedometer to help track (approximately) PA levels. GOTC will encourage participants to use a pedometer and notebook to record their PA results, observations, and behavioral change homework. Walking will be introduced as the first quarter activity in the GOTC program.

Nordic walking. Originating from Scandinavia, Nordic walking (walking with Nordic poles similar to cross-country skiing) is a highly accessible form of brisk walking enjoyed by all age groups. Although Finnish cross-country skiers invented this form of exercise for their training, Nordic walking may be enjoyed casually as well (Santos & Fenandez-Rio, 2013).

Additionally, Nordic walking can be done indoors, outdoors, in urban areas, and out in natural trails as well.

Nordic walking provides many benefits including: improved neuromuscular coordination; increased engagement of the trunk and upper body; 11-23% increased oxygen uptake (VO_2); increased peak heart rate; increased respiratory exchange ratio; increased energy expenditure; superior cardiovascular fitness as compared to regular walking without poles; decrease in body fat mass; better lipid profile; a modality accessible to a wide range of patients (rehabilitation), especially ones with mobility challenges and the older adult population; provide increased stability for those who need it; protect spine and lower extremity joints; low-impact; good alternative to running; provides intensity close to jogging but without a significant increase in rate of perceived exertion (RPE); effective whole-body aerobic exercise; skills may be progressed and regressed easily; safe; increase functional and walking capacity especially with older adults and the obese or very sedentary population. (Barberan-Garcia et al., 2015; Figueiredo et al., 2013; Hagen, Hennig, & Stieldorf, 2011; Parkatti, Perttunen, & Wacker, 2012; Piech & Raczylska, 2010; Shim, Kwon, H. Kim, B. Kim, & Jung, 2013; Tschentscher, Niederseer, & Niebauer, 2013).

Nordic walking is easily progressed/regressed with three major levels—health/wellness, fitness, and sports. The health level (level 1) provides an introduction to the technique of pole walking with goals of introducing an individual to PA, fat loss/weight management, and overall well-being (Piech & Raczylska, 2010). Level 1 technique includes marching, carry the pole, pull the pole, impale the pole, push away to the hip line (Piech & Raczylska, 2010). The fitness level (level 2) goals include endurance, strength, aerobic capacity, and intermediate techniques (Piech & Raczylska, 2010). Level 2 techniques include push away beyond the hip line, straightening the

forearm, open the hand, push off the straps, bend forward, and rotate the shoulders, double poling (Piech & Raczyńska, 2010). Also, as an individual progresses, different terrain/environments (uphill/downhill, steep uphill/downhill, beach, trail, etc.) are mastered. The sport level (level 3) is more dynamic with advanced techniques in Nordic jogging, Nordic striding, Nordic skating, jumping, and strength training with poles (Piech & Raczyńska, 2010; Santos & Fernandez-Rio, 2013).

GOTC will enlist the help of a certified Nordic walking instructor to teach (from second through fourth quarters of the 8-week program) participants proper form: "shoulders should be relaxed; arms and legs must move alternately, poles should be held close to the body, but not gripped tightly; longer strides than in normal walking should be taken; feet should roll from the heel to the ball on each step; poles swing forward, pointing diagonally backwards, and should always be planted between the front and the back foot; and the body is pushed forward past the pole that is forward, until it makes a continuous line with the outstretched arm behind the body" (Santos & Fernandez-Rio, 2013, p. 27).

GOTC's goals are to progress the participants from the health level to the fitness level (level 1-2) in Nordic walking during quarters 2-4 (6 weeks) of the program.

GOTC Program Design

First Quarter (weeks 1-2)

The first two weeks emphasize positivity and motivation, "feeling good" and "getting started". GOTC's goal is to create a mind-body-spirit awareness and respect the whole-person in making a lasting, lifestyle change. Each week, participants will attend two, 1-hour instructor-led group discussion classes addressing behavioral change (BC).

The first BC class will discuss some of the evidence-based benefits of regular PA (educating participants). Using decisional balance, participants will create and share their personal "pros and cons" of PA list. The second BC class will help participants recognize and implement social support, and set up a "rewards" system for the first quarter (Marcus & Forsyth, 2009). The third BC class will discuss barriers and relapse prevention. The fourth BC class will celebrate the first quarter of small successes (each participant will receive a "reward"), introduce plans for the second quarter (weeks 3-4), and use the method of goal-setting to help participants plan out their personal goals (mind, body, spirit) for the remainder of the GOTC program. See Table 1 for the first quarter PA component.

Table 1

First Quarter (weeks 1-2) Acute Training Variables

Intensity	Low to moderate, "comfortably talking"; effort < 75% VO _{2max}
Frequency	2 days per week
Duration	At least 30 min/day, or two 15-minute blocks per day
Exercise Modality	Regular walking (or treadmill) without poles in any environment

Second Quarter (weeks 3-4)

GOTC participants will attend four BC classes during the second quarter. The first BC class will check-in with the participants to discuss any barriers, and how to overcome challenges. Nordic walking will also be introduced and taught by a certified Nordic walking instructor. The second BC class will educate participants on intermittent PA (making small changes in daily routines such as taking the stairs, parking farther away, etc.). In the third BC class, participants will share their experience thus far, and learn more about Nordic walking skills. The fourth BC class will celebrate the completion of the second quarter and reassess/readjust personal goals. See Table 2 for the second quarter PA component.

Table 2

Second Quarter (weeks 3-4) Acute Training Variables

Intensity	Moderate, "moderately difficult to talk, but still able to respond"; effort around 75% VO _{2max}
Frequency	3 days per week
Duration	At least 30 min/day, or two 15-minute blocks per day
Exercise Modality	Nordic walking for health (level 1)

Third Quarter (weeks 5-6)

GOTC participants will attend two BC classes during the third quarter (1 class/week). The first BC class will check-in with the participants to discuss any barriers, and talk about how past successes (what life-skills did they use to overcome hurdles in other areas of their life) can help overcome future PA challenges. The concept and importance of self-efficacy will also be discussed. The second BC class will reiterate making a plan for back-sliding and how to recover. Also, a Nordic walking instructor will introduce level 2 pole walking skills. See Table 3 for the third quarter PA component.

Table 3

Third Quarter (weeks 5-6) Acute Training Variables

Intensity	Moderate, "moderately difficult to talk, but still able to respond"; effort around 75% VO _{2max}
Frequency	5 days per week
Duration	At least 30 min/day, or two 15-minute blocks per day
Exercise Modality	Nordic walking for fitness (level 2)

Fourth Quarter (weeks 7-8)

GOTC participants will attend two BC classes during the fourth quarter (1 class/week) plus a final "celebration" class at the completion of week 8. The first BC class will check-in with the participants to discuss their progress, and conduct an instructor-led, group vigorous-intensity

session that will count towards the 1 day/week vigorous-intensity exercise. The second BC class will help participants plan how to keep PA in their life after the GOTC program finishes.

Another vigorous-intensity, instructor-led session will also be conducted (counting towards the 1 day/week goal for the fourth quarter). See Table 4 for the fourth quarter PA component.

Table 4

Fourth Quarter (weeks 7-8) Acute Training Variables

Intensity	Moderate-vigorous, "moderately difficult to talk, but still able to respond" to "difficult to talk"; effort at or greater than 75% VO_{2max}
Frequency	3 days per week at moderate intensity; 1 day per week at vigorous intensity (instructor-led class)
Duration	At least 20 min/day
Exercise Modality	Nordic walking for fitness (level 2)

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