

Statement of Need

Overweight and obesity is a current epidemic and a major health problem around the world and in the US.¹ In 2008, more than 1.4 billion adults worldwide were overweight; of these, 500 million were obese.^{1,2} Body mass index (BMI) is a measurement tool commonly used to classify overweight and obesity in adults, and is defined as a person's weight in kilograms divided by the square of his/her height in meters (kg/m^2).¹ A BMI $\geq 25 \text{ kg}/\text{m}^2$ is considered overweight and ≥ 30 is considered obese.¹ In the US, 68.8% of adults are overweight, including 35.5% of the population classified as obese.² Overweight and obesity are directly related to increased risk of several chronic diseases and impaired physical function, including cardiovascular disease (heart disease and stroke), pulmonary disease, nonalcoholic fatty liver disease, dyslipidemia, gout, phlebitis, cataracts, diabetes, musculoskeletal disorders, and some cancers.^{1,5,6} It is viable to suggest that these chronic diseases come with a significant price tag, placing an enormous financial burden on the healthcare system. Literature indicates that obesity outranks the healthcare costs of smoking, drinking problems, or living in poverty.^{3,4} Fortunately, overweight and obesity is both preventable and reversible.¹

According to a recent study on the actual causes of death in the United States, physical inactivity, along with cigarette smoking and poor nutrition, was rated among the most important lifestyle-related risk factors for chronic diseases, meaning factors that an individual can change independently.^{7,8} Physical inactivity is strongly related to the main non-communicable diseases such as coronary heart disease, type 2 diabetes and certain types of cancer.⁹ In addition, many studies have demonstrated that physical inactivity is an important determinant of all-cause mortality.^{9,10,11} Both overweight and obesity are correlated with physical activity and cardiorespiratory fitness, with sedentary and unfit persons having greater BMIs and percent body fat.⁵ This indicates that much of the overweight and obesity seen in U.S. populations is caused by a sedentary, physically inactive lifestyle.⁵ Controlled clinical trials have shown that increases in physical activity result in weight loss and changes in body composition and fat distribution.⁵ Furthermore, physical activity interventions are likely to have positive side effects for a range of health-related conditions.¹³ These findings support the statement that overweight and obesity is preventable and reversible.¹

It is commonly understood that physical activity is not a major priority in the office workplace. Studies have found that working adults spend one half to two thirds of their working day sitting down,^{12,16} depending on the occupation. There is also evidence that working adults with higher occupational sitting time do not necessarily compensate for their sitting at work by spending less time in sedentary behaviors during leisure time.¹² Of major concern is that sitting has been found to be associated with increased risk of adverse health conditions such as cardiovascular disease, cancer, overweight and obesity, weight gain, type 2 diabetes and mortality, independent of physical activity.^{9,12,15,16} There has been a marked reduction in work-related energy expenditure over the last 50 years that is estimated to account for a large portion of increased body weight among American adults.¹⁹ One systematic review identified 22 studies indicating an association between occupational sitting and elevated BMI, leading to an increased risk for obesity.¹⁷

This health promotion and wellness proposal is designed to target the sedentary workplace population with interventions to increase physical activity and exercise, thereby decreasing or preventing obesity and the related adverse chronic health conditions. This program is not solely intended for overweight or obese individuals. Rather, it will be an effort to increase physical activity throughout the whole IT department. Regular physical activity appears to provide substantial protection against coronary heart disease (CHD) in overweight individuals as well as individuals with normal BMI. One study indicates that active men with high BMIs have lower CHD rates than inactive men with low BMIs¹⁴. This insinuates the importance of physical activity even in normal-weight individuals.

The program will focus on various levels of the social ecological framework. A social ecological model for health promotion focuses on both the individual and social environmental factors as targets for health promotion interventions.¹⁸ The model assumes that appropriate changes in the social environment will produce changes in individuals, and that the support of individuals in the population is essential for implementing environmental changes.¹⁸ It has been shown that environmentally-focused interventions have potential to reach a whole workforce and not just select volunteers.²⁰ This program will emphasize intrapersonal factors, such as individual motivation and education so the employees will better understand the importance of physical activity. It will also incorporate interpersonal processes of the IT department workgroup in that group activity will be encouraged. It is suggested that “activity-friendly” environments holds promise for improving population-wide physical activity in addition to enabling the long-term success of programs targeting individuals¹³. Finally, there is a need for institutional factors to be implemented, such as more frequent and longer break times throughout the day. This will be an important aspect of the program due to the understanding that too much sitting may be hazardous to health⁷. Recent studies suggest that low intensity standing and ambulating done intermittently throughout the day may be as important for disease prevention and optimization of health as is structured exercise⁷. It will be important to obtain approval of this plan from executive members of the organization to allow employees more frequent and longer breaks. Further, this proposal includes a long-term goal of institutionalizing this health promotion program within the company. With the anticipated success of positive health outcomes in the IT department, there is reason to believe that this program will be implemented throughout IBM's company as a whole.

This proposal will be attainable with the guidance and expertise of a physical therapist. A physical therapist has the relevant knowledge in implementing a program of this magnitude. Physical therapists are also extensively trained to set realistic and safe goals for each individual. Realistic goals will be important in maintaining motivation of the employees throughout the program. Working with a habitually sedentary population, there is also a risk of exertion-related cardiovascular events in individuals who perform unaccustomed vigorous physical activity⁷. This further identifies the importance of a physical therapist, who is trained in prescribing safe exercise interventions and measuring important vital signs, such as heart rate and blood pressure.

It is evident that physical inactivity in the workplace is a growing problem throughout the United States and contributes to the overweight and obesity epidemic. Not only is being overweight or obese a risk factor for a plethora of chronic diseases, physical inactivity is independently shown to contribute to many maladies. Fortunately there are

numerous simple interventions that can be implemented to reverse the negative effects of overweight, obesity and inactivity, leading to a healthier and happier workforce. With a thorough health promotion program led by an expert physical therapist, these interventions can be efficiently and successfully applied in IBM's IT department.

Background

Estimates of aggregate overweight- and obesity-attributable medical spending in the U.S. in 1998 were as high as \$78.5 billion, which would currently be much higher after factoring inflation.²¹ Given the tremendous costs, it is recommended that health administrators and employee wellness program directors take action by supporting evidence-based physical activity programs that can help reduce the burden of obesity on the healthcare system.²¹ For successful implementation of this proposal it is imperative to understand the roll physical activity and exercise plays in decreasing, preventing, and reversing obesity in sedentary adults. Furthermore, it is important to identify literature that supports the promotion of increased physical activity in the workplace and various interventions to make this possible.

The U.S. Surgeon General identifies physical activity promotion as an essential component of obesity control.¹³ Franklin⁷ states, "the roles of endurance and resistance exercise as antiaging interventions and the deleterious effects of prolonged sitting have been better elucidated as modulators of chronic disease and targets for education, behavioral interventions, and policy approaches to improving health."^{7(p. exi)} Exercise and physical activity have been shown to reduce the risk of cardiovascular events and reduce mortality rates by 20% to 50%.⁷ Furthermore, physical activity improves insulin action in obesity independent of weight loss, and improvements can occur within just one week of intervention.⁷

Positively influencing behavior in the workplace requires a shift in focus from individual/personal behavior change to more strategic, comprehensive approaches.²⁰ This will require a shift in thinking, so that 'interventions' are not seen as short-term programs, but as a part of the culture of the workplace.²⁰ In doing this, it is of utmost importance that these approaches include management support and integration with the organizational structure.²⁰ Worksite-based health promotion programs have a number of advantages, including social and environmental components of the workplace, which provide a potential support system for employees.²⁷ The worksite offers a variety of opportunities to strongly encourage physical activity and healthy behavior in employees, such as premium contribution incentives, benefit design incentives, and social incentives (e.g., peer pressure, competitions).²⁷ The most effective worksite-based health promotion programs combine all of the following components: (1) a comprehensive, evidence-based, valid health assessment that has been correlated with claims cost and productivity impairment; (2) strong benefit incentives that induce high levels of employee (and spouse) participation in both health assessment and follow-up programs; (3) an effective communication campaign that promotes the program; (4) effective, evidence-based follow-up education and behavior change programs that generate improved participant health; and (5) strong worksite-based leadership and program management.²⁸ When these

components are in place, the level of participation is high, which leads to sustained health behavior change and improvement in the average health of the population.^{27,28} Participation rates in the $\geq 90\%$ range have been achieved, as well as healthcare cost savings of 3%, and a return on investment of 2:1.^{27,28}

Two randomized controlled trials reported that a lifestyle approach to increasing participation in physical activity among previously sedentary persons can be effective and has similar effects on aerobic fitness, body composition, and coronary risk factors as a traditional structured exercises program.^{22,23} Additionally, the imbalance between physical activity and energy intake at work may contribute to the obesity epidemic.³⁰ This emphasizes the importance of a physical therapist in counseling participants to integrate multiple short bouts of physical activity into their daily lives. One simple approach to encourage standing throughout the day includes computer prompt reminders. Evans et al.²⁹ found that using automatic reminders every 30 minutes on employee computers reduced the amount of time spent sitting for prolonged periods of time. Effective interventions can also be delivered through a variety of communication channels, including face-to-face, telephone, and email.^{13,16,29,33} Healy et al.¹⁶ were successful in implementing a multicomponent intervention to reduce office workers' sitting time through the use of face-to-face and telephone communication channels. The "health coach" delivered an initial 30-minute face-to-face consultation with each intervention participant, followed by a telephone call once/week. The consultation sessions emphasized behavior change strategies (goal-setting and self-monitoring) and encouraged participants to stand up at least every 30 minutes and sit less by using a standing workstation, aiming for approximately equal amounts of sitting and standing time during the day. They were able to achieve sizeable reductions in workplace sitting (> 2 hours per 8 hour workday). To achieve maximal effectiveness, these consultation sessions should be educational in nature. Educational consultation can include information regarding the participants' susceptibility to obtaining a chronic disease secondary to overweight, obesity, and/or inactivity. One may not realize the deleterious effects of being overweight or obese until they are actually diagnosed with a chronic disease or condition. According to the Health Belief Model, "if individuals regard themselves as susceptible to a condition, believe that condition would have potentially serious consequences, believe that a course of action available to them would be beneficial in reducing either their susceptibility to or severity of the condition, and believe the anticipated benefits of taking action outweigh the barriers to action, they are likely to take action that they believe will reduce their risks."^{37(p47)} Reinforcing this idea of perceived susceptibility through education will serve as a benefit in encouraging employees to become more active in order to avoid future health problems.

Creating more "activity-friendly" environments holds promise for improving population-wide physical activity, in addition to enabling the long-term success of programs targeting individuals.^{13,16,27} These types of environments can easily be utilized and incorporated in the workplace. For example, allowing employees to take more breaks throughout the workday can lead to increased physical activity. It is suggested that low intensity standing and ambulating done intermittently throughout the day may be as important for disease prevention and optimization of health as is structured exercise, especially given the evidence of the cardio-metabolic health risks associated with extended periods of sitting.^{7,12,25} Height-adjustable workstations are another viable option

to decrease the amount of sedentary sitting time in the workplace. Thorp et al. found that the use of a height-adjustable workstation reduced employee cardiometabolic risk and fatigue levels, as well as decreased musculoskeletal discomfort, such as low back pain, while maintaining work productivity.²⁶ Alkhajah et al. had similar results showing that sit-stand workstations can substantially reduce office workers' sitting time both at the workplace and overall throughout the week.³¹

The accessibility of an onsite workout facility on IBM's campus will serve as an important addition to this plan. Encouraging the use of this facility will be a large focus in increasing physical activity and exercise throughout the IT department. Although three of four adults say they engaged in leisure-time physical activity during the past month,³⁴ fewer than half participated at the recommended level of moderate activity for at least 30 minutes 5 or more days per week or vigorous activity for at least 20 minutes 3 or more days per week.³⁵ To increase use of the onsite workout facility, face-to-face education in a group setting will be provided by the physical therapist on benefits of exercise and proper workout form/workout ideas. It has been demonstrated that face-to-face education discussing the benefits of exercise is effective in promoting physical activity;¹⁶ however, there is a lack of evidence indicating that education on proper form or providing workout ideas have these same outcomes.

Another approach in encouraging clients to participate in more physical activity is promoting the use of pedometers. Pedometers can be used as a visual cue for participants to be more aware of ambulation by tracking daily step totals and keeping a weekly step diary. According to a systematic review, pedometer users significantly increased their physical activity by an average of 2,491 steps per day more than their control counterparts.²⁴ With appropriate education about the benefits of increasing physical activity and incorporating group/team challenges, it is plausible that this average number of steps can be increased in IBM's IT department further than the above findings. To support this, one randomized controlled trial by Dishman et al.³⁶ used environmental prompts, such as signage, that encouraged physical activity by providing information about the associated health benefits. These signs also illustrated opportunities to be active, such as parking and walking, taking walk breaks, and climbing stairs. This same study facilitated participation with team goal setting. Each team had an average of 9 participants. Team captains were responsible for motivating participants to set goals and earn points for their team. Goals were self-set, specific regarding performance and time, realistic but attainable, and easily assessed. The personal goals involved graduated increases in accumulation of 10-minute blocks of exercise and pedometer steps each week during the intervention. These interventions demonstrated a 51% increase in physical activity and exercise when compared to the control group. This method of education and implementation of teams may also be effective in encouraging moderate to vigorous exercise in the onsite workout facility, although there is a lack of literature to prove this.

It is understood that changing behavior in this type of setting is complex and can be rather challenging without affecting the corporate 'bottom line'.²⁰ There is currently a need for greater understanding and evaluation of desirable employer-related outcomes (reduced absenteeism, job stress, turnover and improved productivity, job satisfaction) and exploration of how these relate to physical activity promotion and adoption.²⁰ Current literature on these employer-related outcomes have fairly low methodological quality;

however, this evidence demonstrates that increasing physical activity in the workplace is a promising and achievable intervention.^{7,12,13,16,20,21,27,32,36}

Program Description

Objectives

It is of practical importance that this program exhibits positive changes in the health of those participating to demonstrate its effectiveness and success. The overall value of the program will be measured at termination of the intervention with comparison of baseline and follow-up results. The measurement of these results is further discussed in the “Program Evaluation” section of the proposal. Nonetheless, program goals are warranted in order to propose the expected and potential outcomes:

Group goals:

- Participating employee BMI will decrease by 1 point on average in 10 months. (Note: 1 BMI point is equivalent to 6 lbs)
- 80% of participants will decrease their percent body fat by 2% as measured by an arm-to-arm Omron HBF-306C device in 10 months.
- Average employee steps per day will increase by 2,000 steps as measured by a pedometer in 10 months.
- Average employee job satisfaction levels will improve by 2 points on a self-report global job satisfaction survey by 10 months. (Note: survey contains 1 question on an 11-point scale)

It must be understood that the above goals take into account all participating employees, and are therefore predicted overall averages. For example, a BMI decrease of 1 point demonstrates the average BMI loss throughout the whole department. Because this goal is also capturing individuals who already have a healthy baseline BMI, it may appear as though this is not a significant decrease. This emphasizes the importance of making individual goals tailored to each employee that will be measured throughout the intervention plan. These individual goals are further addressed in the following section.

Methods

This health promotion program will be implemented and fully completed in 10 months with the direction of one lead therapist. Before implementation of this program, the lead therapist will have a 1-hour meeting with senior management of IBM’s IT department. A complete understanding of this initiative will be critical in appreciating the benefits of the program and why the funds being put forth are appropriate for successful outcomes. The goal of this meeting will be for further discussion on details of the program, potential benefits for the employees and the department as a whole, and to gain managerial support and participation. The importance of organizational support will be emphasized for successful intervention adoption. An email invitation will then be sent by management to all IT department employees to attend an information session.

An initial 1-hour presentation will be delivered to the IT department by the lead therapist. The first 30 minutes of this presentation will consist of educating the employees

on the current trends of overweight, obesity, and physical inactivity in the workplace to raise awareness of perceived susceptibility, and how these three factors are detrimental to one's health. The last 30 minutes of the presentation will cover the health promotion program being initiated in this department to improve perceived benefit of physical activity, and details on how it will be implemented. Evidence will be used in this presentation to instruct various ways to increase activity in the workplace and illustrate the numerous positive outcomes associated with a workplace health and wellness program.

Each participating employee will have an individual 45-minute meeting with the lead therapist within the next two weeks. This meeting will serve to offer more details about the program, explain all procedures and instructions, educate on ways to increase activity in the workplace, obtain baseline measurements, and set individual goals. This will also provide an opportunity for the lead therapist to obtain information from each participant in regards to their current exercise and physical activity level. The individual goals will include all of the aforementioned objective goals and will consist of short-term goals, which will be measured at 5 months, and long-term goals, which will be measured at the 10-month follow-up. Aside from the individual goals that will be measured by the lead therapist, each participant will be encouraged to set personal goals each week. These goals are to include increasing the number of steps they take in a day and how much exercise they get each week. Advice on goal setting will be given to each participant from the lead therapist in accordance to the participant's current level of activity. The participants will also either receive a pedometer or be encouraged to download a pedometer app onto their mobile device during this meeting. Proper use of the pedometer will be explained and participants will be instructed to record their daily step count in an excel spreadsheet at the end of each day. The participants will be asked to email the spreadsheet to the lead therapist every Friday for outcomes assessment.

After all initial consultations are complete there will be another educational presentation at IBM's employee fitness center for all participants. There will be four opportunities to attend this presentation during weeks three and four, and participants are encouraged to attend multiple times if needed. This presentation will discuss the differences between aerobic and anaerobic exercise and the benefits of each, the use of various resistance machines, the concept of the FITT (Frequency, Intensity, Time, Type) principle, and the importance of proper form. Participants will also be encouraged to set personal goals each week for gradual increases in relation to the FITT principle.

At the beginning of month two, all participants will have attended one of the four presentations given at the employee fitness center. A support system will now be applied to this program through a fitness challenge competition in hopes to encourage continued participation. The participants will be randomly divided into groups of 10. The lead therapist will record the number of steps taken for each team on a weekly basis, and the team with the most total steps for the week will be displayed on a poster in the break room. This challenge will further be incentivized through the allowance of a casual-dress Monday for the winning team. Furthermore, participants will weigh-in every other week. The idea of bi-weekly weigh-ins will be to stimulate group exercising at the employee fitness center. Total weight loss will be calculated for each group and displayed in the break room. The team that loses the most weight by the 10-month follow-up will be

recognized at the final group follow-up presentation and will receive “fitness challenge champions” t-shirts.

Cues to action, such as environmental prompts will include signs throughout the worksite that encourage physical activity with a focus on perceived susceptibility. Various signs will also offer examples on being more active throughout the day, such as parking farther away, taking the stairs, and taking frequent rest breaks. These signs will be placed in areas of high traffic, such as the break room, restrooms, water fountains, elevators, and stairwells. They will be changed each month to vary the messages within the same themes. Examples of signs that may be placed throughout the office include:

- “Too much sitting is associated with higher rates of all-cause and cardiovascular mortality, obesity, certain types of cancer, type 2 diabetes, and metabolic syndrome, as well as other physiologic derangements.^{7,9}”
- “Physical inactivity is the fourth largest preventable cause of U.S. deaths, behind smoking, high blood pressure, and overweight/obesity.¹³”
- “Taking the stairs or parking farther away is an easy way to increase physical activity and steps per day.”

Motivational and educational emails will be sent to all employees once per week. These emails may include exercise tips, nutritional tips, recipe of the week, exercise of the week, benefits of aerobic versus anaerobic exercise, benefits of adequate sleep, directions and information about local parks, walking routes/paths to consider using around IBM’s campus, and/or inspiring stories about individuals the lead therapist has previously worked with who have succeeded in a weight loss program. Winners from each weeks pedometer challenge will also be announced via this email newsletter.

Examples of tips that may be included in the weekly email include:

- “Long exercise sessions can be broken into shorter periods of activity, such as three 10- or 15-minute exercise bouts, and have similar physiologic improvements.⁷”
- “Fat-free mass (muscle) burns more calories at rest than fat, indicating that resistance training can help in weight loss long after you leave the gym.³⁹”
- “More calories are burned during static standing than static sitting.”

Each participant will have an automated computer-prompting program installed on his or her work computer that displays a reminder to take a 5-minute standing/walking rest break every hour. These prompts will not lock the employee out of their computer and can simply be ignored. However, it is anticipated that these reminders will help motivate the participants to be more active throughout the day.

The lead therapist will make a personal phone call to each employee once every month. This phone call will serve to educate, motivate, discuss progress of the program, discuss personal goals, and how to overcome any barriers preventing goal achievement. Goals will also be updated as needed at this time according to the participant’s feedback and progress. In addition to monthly phone calls, the lead therapist will also conduct a short 15-minute face-to-face meeting with each participant halfway through the program (at five months) for measurement of the objective goals (BMI, body composition, job satisfaction). Because each participant will be emailing step amounts each week, the lead therapist will already have this information.

Conclusion of the program will include a 10-month follow-up in which each participant will have a 30- to 45-minute meeting with the lead therapist. During this time,

measurements will be taken again for comparison of the baseline measurements. This will also provide opportunity for the participant to provide feedback to the therapist about how the program was conducted overall. Additionally, personal goals will be analyzed and the participant will receive education on how to continue progression of these goals. Once all individual meetings are complete the lead therapist will deliver a final 1-hour presentation to all participants to discuss outcomes of the program and announce winners of the fitness challenge. The take-home message will emphasize maintenance of physical activity throughout the lifespan. Attaining improved health through increased physical activity during a 10-month program is great; however, in order to gain optimal health benefits, one is required to maintain these newly formed habits without the help of a structured program. The lead therapist will provide references for personal trainers and dietitians, as well as advice on how to take what they have learned during the past 10 months and apply it to every-day life.

Program Evaluation

As mentioned in the program methods, each participant will have a confidential face-to-face meeting with the lead therapist at baseline, five months, and 10 months. These meetings will not only be important in evaluating each individual participant for their objective goals, but also the program as a whole. A checklist consisting of all participant names will be used at each of the three meetings to monitor dropout rates. Evaluating the dropouts during this program will help in assessing if the program is too difficult or if there is a lack in motivating factors provided by the program. Program evaluation surveys will also be emailed to all participants at 5- and 10-months to determine the quality and effectiveness of the program, as well as what changes should be made for future programs. Additionally, those who chose to dropout of the program will be encouraged to complete this survey. This short survey will consist of the following general questions devised by the lead therapist:

1. On a scale of 0-10, 0 indicating unchanged and 10 indicating extremely more healthy, how much healthier would you say you are since starting this program?
2. On a scale of 0-10, 0 indicating not helpful at all and 10 indicating extremely helpful, how helpful have the cues to take action (signs, emails, automated computer prompts, phone calls) been in keeping you motivated to become more physically active?
3. If you have found the cues to action to be helpful in keeping you motivated to become more physically active, which cue has helped you the most?
4. On a scale of 0-10, 0 indicating extremely unsatisfied and 10 indicating extremely satisfied, how satisfied are you with this program?
5. Briefly discuss the strengths of the program.
6. Briefly discuss aspects of the program that you would like to see changed/ungraded/added/removed, or anything that you think would make the program better.

Body mass index will be used as a general measure of body fat based on height and weight of each participant. The Prospective Studies Collaboration⁴⁰ found that BMI is a strong predictor of overall mortality when above the optimum of 22.5-25 kg/m². BMI will be assessed for each participant during the three confidential face-to-face meetings, and the total department average will be calculated at each of the three meetings by the lead therapist. This calculated average will demonstrate the predicted decrease of the department's BMI, thus showing an inverse relationship in better participant health.

Percent body fat will be measured with an arm-to-arm Omron HBF-306C device (Omron Healthcare, Kyoto, Japan). This device measures body composition via bioelectrical impedance analysis. It has been demonstrated that the HBF-306C is a valuable tool to track changes in body composition over time.³⁸ This method also eliminates the possibility of measurement bias that could occur with skinfold assessments. Measuring percent body fat will hopefully demonstrate a loss in adipose tissue, signifying an improvement in obesity and increased physical activity. Percent body fat will be assessed for all participants during each of the three confidential face-to-face meetings in which the total department average will be calculated by the lead therapist.

Steps per day will be monitored by the lead therapist on a weekly basis via email from each participant. Monitoring pedometer step average will directly measure physical activity level. Each participant's steps per day will be averaged each week. For example, all steps recorded Monday through Sunday for one participant will be totaled and divided by seven. This number will be used, along with all other participant's weekly averages, to determine the department average for each week. This method will demonstrate step trends over the entire 10-month period and indicate increased physical activity level on average.

It could be argued that a program such as this will not only be costly, but will also interfere with the productivity of the workplace secondary to the baseline and follow-up education classes, and the allowance of more break time for employees throughout the day. However, because much of IBM's workforce is highly knowledge-based in their area of work, employees could be considered the organizations most valuable asset. Thus, their continued health and productivity are essential for good organizational performance and profitability to the company. It is, therefore, important that this program includes measures that will be of interest to management, such as job satisfaction.²⁰ A one-question job satisfaction survey will be administered during the baseline face-to-face meeting with the lead therapist, and will also be included in the program evaluation survey at the 5- and 10-month follow-up. The one-question survey will ask the following: on a scale of 0-10, 0 indicating extremely unsatisfied and 10 indicating extremely satisfied, how satisfied are you with your job?

One potential limitation to these methods is the use of only one therapist. The addition of another therapist could potentially foster improved efficacy of this program and stimulate more significant outcomes. Understandably, the current economy holds limitations on financial allowances of many businesses, IBM being one of them. Nevertheless, these interventions are still probable of showing success in improving the overall health of IBM's IT department employees with the use of one therapist. Through the organizational structure of this health promotion program and management of the lead therapist, all goals are realistic and attainable.

References

1. World Health Organization. Overweight and Obesity. *World Health Organization Media Center*. <http://www.who.int/mediacentre/factsheets/fs311/en/>. Updated August 2014. Accessed September 13, 2014.
2. Flegal KM, Carroll MD, Kit BK, Ogden CL. Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999–2010. *JAMA* 2012;**307**:491-497.
3. Sturm R. The effects of obesity, smoking, and drinking on medical problems and costs. *Health Affairs*. 2002;**21**(2):245-253.
4. Sturm R, Wells KB. Does obesity contribute as much to morbidity as poverty or smoking? *Public Health*. 2001;**115**:229-235.
5. Blair SN, Brodney S. Effects of physical inactivity and obesity on morbidity and mortality: current evidence and research issues. *Medicine & Science in Sports & Exercise*. 1999;**31**(11):646.
6. Errickson SP. Obesity: the epidemic and an ounce. [PowerPoint]. Chapel Hill, NC: UNC Physical Therapy Program; 2013.
7. Franklin BA. Health implications of low cardiorespiratory fitness, too little exercise, and too much sitting time: changing paradigms and perceptions. *Amer J Health Promotion*. 2011;**25**(4):exi-exv.
8. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States. *JAMA*. 2004;**291**:1238–1245.
9. Rezende LF, Lopes MR, Rey-Lopez JP, et al. Sedentary behaviors and health outcomes: an overview of systematic reviews. *PLoS ONE*. 2014;**9**(8):1-7.
10. Paffenbarger RS, Hyde RT, Wing AL, Hsieh CC. Physical activity, all-cause mortality, and longevity of college alumni. *N Engl J Med*. 1986;**314**: 605–613.
11. Lee IM, Hsieh CC, Paffenbarger RS. Exercise intensity and longevity in men. The Harvard Alumni Health Study. *JAMA*. 1995;**273**:1179–1184.
12. Chau JY, van der Ploeg HP, van Uffelen JG, et al. Are workplace interventions to reduce sitting effective? A systematic review. *Preventive Medicine*. 2010;**51**:352-6.
13. King AC, Sallis JF. Why and how to improve physical activity promotion: lessons from behavioral science and related fields. *Preventive Medicine*. 2009;**49**:286-8.
14. Morris JN, Clayton DG, Everitt MG, et al. Exercise in leisure time: coronary attack and death rates. *Br Heart J*. 1990;**63**:325-34.
15. Hu FB, Li TY, Colditz GA, et al. Television watching and other sedentary behaviors in relation to risk of obesity and type 2 diabetes mellitus in women. *JAMA*. 2003;**289**(14):1785-91.
16. Healy GN, Eakin EG, LaMontagne AD, et al. Reducing sitting time in office workers: short-term efficacy of a multicomponent intervention. *Preventive Medicine*. 2013;**57**:43-8.
17. van Uffelen JGZ, Wong J, Chau JY, et al. Occupational sitting and health risks: a systematic review. *Am J Prev Med*. 2010;**39**(4):379-88.
18. McLeroy KR, Bibeau D, Steckler A, et al. An ecological perspective on health promotion programs. *Health Educ Behav*. 1988;**15**:351-77.

19. Blankenship J, Granados K, Braun B. Effects of subtracting sitting versus adding exercise on glycemic control and variability in sedentary office workers. *Appl Physiol Nutr Metab*. 2012;39:1-8.
20. Marshall AL. Challenges and opportunities for promoting physical activity in the workplace. *Journal of Science and Medicine in Sport*. 2004;7(1):60-66.
21. Task Force on Community Preventive Services. A recommendation to improve employee weight status through worksite health promotion programs targeting nutrition, physical activity, or both. *Am J Prev Med*. 2009;37(4):358-9.
22. Dunn AL, Marcus BH, Kampert JB, et al. Comparison of lifestyle and structured interventions to increase physical activity and cardiorespiratory fitness: a randomized trial. *JAMA*. 1999;281:327-334.
23. Andersen RE, Wadden TA, Bartlett SJ, et al. Effects of lifestyle activity vs structured aerobic exercise in obese women: a randomized trial. *JAMA*. 1999;281:335-340.
24. Bravata DM, Smith-Spangler C, Sundaram V, et al. Using pedometers to increase physical activity and improve health: a systematic review. *JAMA*. 2007;298:2296-2304.
25. Hamilton MT, Healy GN, Dunstan DW, et al. Too little exercise and too much sitting inactivity physiology and the need for new recommendations on sedentary behavior. *Curr Cardiovasc Risk Rep*. 2008;2:292-8.
26. Thorp AA, Kingwell BA, Owen N, et al. Breaking up workplace sitting time with intermittent standing bouts improves fatigue and musculoskeletal discomfort in overweight/obese office workers. *Occup Environ Med*. 2014;0:1-7.
27. Thygeson NM. A health plan perspective on worksite-based health promotion programs. *Am J Prev Med*. 2010;38(2S):S226-S228.
28. Thygeson NM, Gallagher J, Cross K, Pronk NP. Employee health at BAE systems: an employer-health plan partnership approach. In: Pronk NP, ed. ASCM's worksite health handbook, second edition. A guide to building healthy and productive companies. Champaign IL: Human Kinetics; 2009:318-26.
29. Evans RE, Fawole HO, Sheriff SA, et al. Point-of-choice prompts to reduce sitting time at work: a randomized trial. *Am J Prev Med*. 2012;43(3):293-7.
30. Engbers LH, van Poppel MN, Paw MJ, et al. Worksite health promotion programs with environmental changes: a systematic review. *Am J Prev Med*. 2005;29(1):61-70.
31. Alkhaja TA, Reeves MM, Eakin EG. Sit-stand workstations: A pilot intervention to reduce office sitting time. *Am J Prev Med*. 2012;43(3):298-303.
32. Conn VS, Hafdahl AR, Cooper PS, et al. Meta-analysis of workplace physical activity interventions. *Am J Prev Med*. 2009;37(4):330-9.
33. Sternfeld B, Block C, Quesenberry CP. Improving diet and physical activity with ALIVE: A worksite randomized trial. *Am J Prev Med*. 2009;36(6):475-83.
34. Centers for Disease Control and Prevention. Trends in leisure-time physical inactivity by age, sex, and race/ethnicity – United States, 1994-2004. *MMWR*. 2005;54:991-4
35. CDC. Prevalence of regular physical activity among adults – United States, 2001 and 2005. *MMWR Morb Mortal Wkly Rep*. 2007;56:1209-12.
36. Dishman RK, DeJoy DM, Wilson MG, et al. Move to improve: A randomized

- workplace trial to increase physical activity. *Am J Prev Med.* 2009;36(2):133-141.
37. Champion VL, Skinner CS. The health belief model. In: Glanz K, Rimer BK & Viswanath K, eds. *Health behavior and health education: Theory, research, and practice.* 4th ed. San Francisco, CA: Jossey-Bass; 2008:45-66.
 38. Loenneke JP, Barnes JT, Wilson JM, et al. Reliability of field methods for estimating body fat. *Clin Physiol Imaging.* 2013;33:405-8.
 39. Zurio F, Larson K, Bogardus C, et al. Skeletal muscle metabolism is a major determinant of resting energy expenditure. *J Clin Invest.* 1990;86(5):1423-7.
 40. Prospective Studies Collaboration. Body-mass index and cause-specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies. *Lancet.* 2009;373:1083-96.