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INTERVENTION STRATEGY

FOR **OVERWEIGHT AND OBESITY**

AS AFFECTED BY **PHYSICAL ACTIVITY**

IN **EARLY ADOLESCENTS** LIVING IN **CAMBRIDGE, MA**

Abbie B. Green

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Background and Significance

The prevalence of childhood and adolescent overweight and obesity has reached epidemic proportions in the United States. The nation has seen rates triple in the last three decades, and Cambridge, MA has rates that are higher than the nation's.^{1,2} The benefits of physical activity (PA) are well known, especially in combating overweight and obesity, and there are many interventions helping people to change their exercise behaviors to affect their weight.

“Overweight” and “obese” have specific definitions in a medical context. Body Mass Index (BMI) is the ratio of one’s weight to one’s height. For children and adolescents, BMI is not evaluated in isolation; rather it is compared to other children and adolescents of the same age and gender to be able to assess the percentile of the individual with respect to the population. The American Obesity Association references children and adolescents over the 85th percentile in BMI score as overweight, and those over the 95th percentile as obese.³

In 2004, 18.8% of children (ages six to eleven years old) in the U.S. were over the 95th percentile of BMI, and 17.4% of adolescents (ages twelve to nineteen years old) in the U.S. were over the 95th percentile of BMI, i.e. about 18% of the nation’s children and adolescents were obese.⁴ Both of these rates are approximately triple of what they were in 1976-1980.⁴ In 2005, 20% of Cambridge children and early adolescents were obese, compared to only 11.2% of Massachusetts high school students (data not available for younger age groups).^{1,2} While the city Cambridge is only slightly above the national average, it is significantly above the state average, and an additional 18% of children and early adolescents in Cambridge are between the 85th and 95th percentiles.² Cambridge’s aggregate percent of public school children in grades K-8 over the 85th percentile is 38%, compared to its neighbor Boston in which 27% of high school students are over the 85th percentile.^{1,2}

The effects of childhood and adolescent obesity are immediate as well as long-term. Children and adolescents who are overweight or obese are at an increased risk for a plethora of chronic diseases, both now as well as later in life, such as: type II diabetes, cardiovascular disease, hypertension, dyslipidemia (high cholesterol), sleep apnea, asthma, and other respiratory problems.⁵ In addition to these physical problems overweight children and adolescents are also at risk for psychosocial problems, such as experiencing discrimination, stress, and low self-esteem. The most prominent concern though, is

the increased risk of adulthood obesity.⁶

Overweight and obesity, and their associated health problems, also have a significant economic impact on the U.S. health care system. Direct medical costs include preventive, diagnostic, and treatment services related to obesity. Indirect costs include morbidity costs – the value of income lost from decreased productivity, restricted activity, absenteeism, and bed days; and mortality costs – the value of future income lost by premature death.⁷

Overweight and obesity are complex, chronic disorders, resulting from many contributing factors. The root of the problem is an imbalance between caloric intake and caloric expenditure (i.e. *eating too many calories and not getting enough exercise*). This can be influenced by genetics, metabolism, behavior, environment, culture, and socioeconomic status. Behavior and environment are considered to be two of the largest contributors, as well as the greatest areas for prevention and treatment.⁸

There are many ways to try to affect overweight and obesity, such as changing nutrition or PA levels through comprehensive or targeted programs directed at age, gender, ethnicity, education, behavior modification, counseling, or environmental changes. Including PA as part of a plan to help reduce overweight and obesity morbidity has proven to be a very important component, as Sharma recognized that PA is one of the more easily modifiable behaviors.⁹ There are also other benefits of PA for early adolescents, including: muscular strength, cardiorespiratory fitness, bone mass, blood pressure reduction, anxiety and stress reduction, self-esteem building, and active lifestyle establishment, thereby yielding further incentives for the use of PA with early adolescents.¹⁰

The International Consensus Conference on Physical Activity Guidelines for Adolescents recommends that, "[A]ll adolescents... be physically active daily, or nearly every day, as part of play, games, sports, work, transportation, recreation, physical education, or planned exercise, in the context of family, school, and community activities" and that, "adolescents engage in three or more sessions per week of activities that last 20 minutes or more at a time, and that require moderate to vigorous levels of exertion".¹¹

Carrel, et al performed a nine-month randomized control trial in 2005 with a school-based exercise program for 50 middle school early adolescents with BMI scores above the 95th percentile.¹² The investigators observed positive results on all three measures considered – loss of body fat,

cardiovascular fitness, and fasting insulin level.¹² Carrel concluded that small yet consistent changes in amounts of PA has beneficial effects on body composition and fitness in children and adolescents.¹²

Murphy, et al performed a meta-analysis of 24 randomized control trials on the effect of walking on fitness, fatness, and resting blood pressure.¹³ The authors discovered that walking interventions increased aerobic fitness, and decreased body weight, BMI, percent body fat, and resting diastolic blood pressure in previously sedentary adults ($p < 0.05$ for all).¹³ The authors then concluded that the results of the study provide evidence that healthy yet sedentary individuals who take up a program of regular brisk walking improves several known risk factors for cardiovascular disease, which are also indicators for overweight and obesity.¹³

Target Population

The proposed target population, early adolescents (ages 11 – 14 years old) in public schools in the city of Cambridge, MA, were selected for several reasons. First, the prevalence rates of overweight and obesity among early adolescents in Cambridge, MA are higher than the state's and the nation's.^{1,2} Second, public schools are a preferred venue for intervention with school-age children and adolescents due to the structure available for mandatory participation, as well as for the large numbers of children and adolescents who can be reached. Third, since early adolescents have outgrown “play”, yet are also not old enough to participate in varsity sports either, they get find themselves in a PA gap, without an outlet to expend calories nor to release stress. Fourth, PA tends to decrease with age, and this is an appropriate age developmentally to instill a love for exercise and activity.

Since the target population of 11 – 14 year-olds will be accessed in a school setting, the corresponding school grades, sixth – eighth grades, will be the recipients of the intervention. The program is tailored to fit the target population by utilizing a combination of techniques to affect them, thereby increasing the number of interactions students have with the program. Since early adolescence is a critical time during which to develop healthful PA habits and behaviors, participation will be mandatory to avoid possible low voluntary participation rates.

The intervention will be implemented as a pilot program at the Maria L. Baldwin Elementary School for the students in grades six through eight. The Baldwin School is one of twelve elementary schools in the Cambridge Public School (CPS) District, eleven of which educate seventh and eighth

grades (i.e. middle school).¹⁴ Located in the Agassiz Neighborhood of Cambridge, The Baldwin School offers convenient access to a large athletic field, the Sacramento Field. Baldwin is the only CPS Elementary School that does not offer athletic teams for students in seventh and eighth grades, nor does it offer other after-school physical activities for those students.¹⁴ Baldwin is also one of nine CPS Elementary Schools that does not currently offer a Walking Club.¹⁴

Performance, Learning, and Change Objectives

There are three performance objectives for this program, each designating a different population, and its function in ameliorating overweight and obesity among early adolescents in Cambridge, MA through PA. The first performance objective, addressing the primary target population of the intervention, states, “Early adolescents in grades 6 – 8 will engage in the recommended amounts of physical activity.” The constituents of the first performance objective will be affected by the program activities of the intervention itself. Key learning objectives for the target population of the first performance objective are to articulate facts about PA and healthy weight; keep a schedule/calendar of PA times; recognize and believe that PA can be fun, enjoyable, and easy, and that they’ll want to do it again; report “good feeling” experienced after participating in PA; express confidence in ability to perform and participate in PA, and continue engaging in it long-term; and incorporate PA into part of daily routine.

The second and third performance objectives, addressing peripheral populations, state, “Parents and guardians will support and encourage physical activity programs in schools that promote healthy weight in early adolescents”, and, “School administrators will support and employ physical activity programs in schools in order to promote healthy weight in early adolescents”, respectively. The constituents of the second and third performance objectives will be affected by adoption and implementation activities. Key learning objectives for the second and third performance objectives are to articulate facts about PA and healthy weight; recognize and believe that PA can be fun, enjoyable, and easy, and that child will want to do it again; expect child to feel better about self and perform better in school; be supportive of school’s efforts to increase child’s PA; express confidence in ability to support child to participate in PA; express confidence in child’s ability to perform, participate, and continue engaging in PA in the long-term; recognize that child feels good after participating in PA; and keep a

schedule/calendar of PA times and seasons.

Key change objectives for all performance objectives are school Physical Education Departments and Health Education Departments will work to provide more school-based opportunities for participatory PA that are also more appealing and related to class instruction, and state legislatures will strengthen existing public school PA requirements and develop better infrastructure and funding. All of performance, learning, and change objectives are outlined in Appendix A.

Techniques, Methods, and Strategies

The primary intervention technique designated is Health Policy/Enforcement, where regulations, laws, or policies are used to mandate health behavior change, rather than educating or persuading the ultimate target population. An advantage to changing health policy is that it allows the intervention to affect large numbers people for extended periods of time. Schools provide an excellent way to employ health policy changes to affect early adolescents. A drawback though, is that mandatory participation can be seen as controversial and unwanted.

Another intervention technique to be used is Health Education, which is the use of formal, organized education. Health Education will be used in schools to teach the recipients of the intervention the subject matter of the learning objectives. An advantage to using the Health Education technique is that it provides the opportunity to focus educational efforts on a specific population. A drawback however, is that Health Education does not afford as much latitude as may be necessary to influence and persuade the population to change behaviors.

Health Communication, a technique where health information is transmitted to one or many persons via informal methods, will also be used in the program. Different communication channels will be used for different populations, such as intrapersonal channels for key school administrators, interpersonal channels for teachers, organization/community channels for parents and guardians, and mass media channels will be used for all constituencies. There are several advantages to using Health Communication, including that efforts of this technique achieve many program objectives simultaneously, that a large number of the targeted populations are exposed to program messages for comparatively smaller costs, and that it is perceived as relatively non-threatening. A drawback to using Health

Communication is that it may not be as effective in teaching comprehensive knowledge.

The techniques chosen are suitable to their respective target populations aimed at affecting, and a complete list of all of the theoretical methods and practical strategies born from them for key learning and change objectives are outlined in Appendix B.

Intervention Design

The intervention submitted here to ameliorate overweight and obesity among early adolescents living in Cambridge, MA, utilizes a comprehensive, school-based PA program to provide the target population with greater access to PA. The year-long program has two separate components – a walking recess activity before lunchtime and a Physical Education (PE) instructional class during the school-day. Participation will be mandatory for all sixth, seventh, and eighth grade students at the Baldwin School, barring the presence of physical limitation. While time constraints do exist in the school-day, the consistent PA prescribed in this program will provide substantial benefits to the recipients.

The program components collaborate to fulfill two principal goals. The first goal is to ensure that middle school students in CPS are getting the International Consensus Conference on Physical Activity Guidelines for Adolescents recommended amounts of PA while they are enrolled in the public school system.¹¹ The second goal is to instill early adolescents with an enjoyment of PA, while also generating an interest in the physical and emotional benefits of PA, and therefore motivating them to continue engaging in PA over the lifespan.

The overall administrator for the program will be Dr. Robert J. McGowan, Coordinator of Health, Physical Education, and Athletics for CPS.¹⁵ He will ensure that the components are implemented as planned, as well as deal with specific issues as they arise. The two K-8 Physical Education instructors at Baldwin, Jim Edgehill and Mike O'Connell, will manage daily aspects of program execution, as well as administer the PE class component.¹⁶ All other teachers of the sixth, seventh, and eighth grades will administer the walking recess component.

Advocacy and support for the program will come from the city of Cambridge and its Healthy Living Cambridge campaign.¹⁷ The campaign encourages residents to eat better and be more physically active, through initiatives such as Cambridge Walks, Fitness Buddies, and Cambridge Moves.¹⁷ Cambridge

Moves' mission is to promote healthy weight and an overall balanced lifestyle in children and adolescents by increasing access to and participation in PA.¹⁷ The city of Cambridge also utilizes public schools' access to children by providing families with annual Health and Fitness Progress Reports of school children.¹⁷

Letters will be sent to the parents and guardians of all of the sixth, seventh, and eighth grade students at Baldwin about their child's participation in the new program. After the pilot implementation, the program may be offered every year to middle school students at Baldwin, to give students a three-year exposure to the program. Eventually, the program will be expanded to serve all CPS sixth, seventh, and eighth graders.

Component #1: Walking Recess

The first component of this program, walking recess, reshapes traditionally unstructured recess into a structured recess time specifically for walking. Currently, all students at Baldwin have a daily ten-minute unstructured recess before proceeding to their lunch periods, which are 30 minutes long.¹⁶ Baldwin School has four recess/lunch periods to accommodate the entire student body.¹⁶ The walking recess component will modify both the duration and the activity of recess sessions for sixth, seventh, and eighth graders three times per week to a 20-minute, structured recess period explicitly for a walking activity. On Mondays, Wednesdays, and Fridays, ten minutes will be taken away from the lunch time and added to the recess time to allow for a total of 20 minutes of walking, which will include the time spent walking to field, walking around the track, and walking back to the school property. However, school administrators are welcome to adjust the school schedule in other ways to extend the recess time to the 20 minutes needed for the walking.

The immediate outcome of the walking recess component is that students will be engaging in the recommended amounts of moderate PA.¹¹ The expected intermediate outcomes are that students will enjoy and appreciate walking, and elect to continue engaging in the activity after their interaction with the intervention concludes. The long-term goal of the component is that the early adolescents participating in it will have a decreased incidence of overweight and obesity. Having a singular focus on walking as the form of PA has several advantages that contribute to achieving the desired outcomes: 1) walking is easy and inclusive (it does not require special athletic abilities or talents), 2) walking is accessible (it does not

require special equipment or facilities), 3) walking is affordable, 4) walking can be a moderate or vigorous activity, depending on pace, and 5) walking is an activity in which people can participate over the lifespan.

At the present time, the recess/lunch periods begin with students lining up to walk across the street to the Edward Alden Playground, the regular site of recess. The walking recess component will alternatively have the sixth, seventh, and eighth graders will form a separate line on Mondays, Wednesdays, and Fridays and walk to the Sacramento Field, which is adjacent to the playground. At the field, they will walk on the track at the perimeter of the field. The students will be allowed and encouraged to socialize and converse during the walk, just as they would while sitting in the cafeteria or during unstructured recess. After walking at the track for 15 minutes, students will line up again and walk back to the school property. Students will engage in regular recess activities on Tuesdays and Thursdays.

The teachers of the middle school classes will facilitate and supervise the walking recess. Teachers will be provided with pedometers to set the pace for the walking at about a 20 minutes per mile pace, with the goal that the group will walk about one mile during their outing. However, it is more important that the students walk continuously for the recess time, than to necessarily walk at a specific pace. It will be the teachers' duties to keep the students walking in a safe and orderly manner. Teachers will do this by utilizing a "buddy system" for the walk to and from the field, and by distributing themselves among the group of students while walking at the field, to help prevent students from lagging behind the entire group. If there are students who have particular difficulty keeping up with the rest of the group, a teacher will be assigned in the schedule to walk with those students and encourage them to keep going. It is better for these students to walk slower and not as far, then to not walk at all.

Teachers will supervise the walkers on a rotating schedule, requiring about half of the teachers of the classes assigned to a lunch period to participate every other walking-day, thus sharing responsibilities minimally among staff.¹⁴ At the beginning of the school-year, teachers will be assigned to the schedule so that the student-to-teacher ratio is 20:1. Teachers will be allowed to "trade" days with other teachers to accommodate their personal schedules, as long as a supervision ratio of 30:1 is not exceeded, as per the state guidelines.¹⁸ Even though teachers are mandated to participate in the program, they will also experience benefits of the walking activity, while also setting a positive example for the students.

It is preferable for the students to walk outside, both to get fresh air, as well as to mimic the

unstructured recess to which they are accustomed. Walking outdoors also offers the advantage of the students not having to be as careful about their noise levels, allowing the students to talk without significant regard for volume. However, during inclement weather, the students can walk around the perimeter of the school gymnasium.

Students are required to come to school prepared to walk on walking recess days, i.e. proper footwear and clothing/outerwear. Although outerwear worn to school for the day can be worn during the walking recess, footwear worn to school may not be appropriate for walking. It will be recommended to students and their parents and guardians that an extra pair of comfortable walking shoes be kept in students' lockers for this purpose. If a student is unprepared to participate in the walking recess, then that student will attend the regular recess activities. After three instances of unpreparedness, a letter will be sent home to the parents or guardians discussing the situation.

Although some students may be resistant to the walking recess component, every student will be required to participate since the minimum walking pace will only require moderate exertion (and not vigorous). Exceptions will be allowed for students and teachers who cannot physically participate due to injury, illness, or disability. A note from a physician will be sufficient to excuse a student from the walking recess, just as it would be for PE class.

Several incentives will be used to garner student motivation and cooperation. Interested students will be distributed pedometers to track distances walked, as well as be taught how to take and record heart rates before and after walking. These activities will help the students monitor their physical progress. Students will also be encouraged to display how they feel after walking by using magnetic "Today I feel" mood faces, to help them become aware of the emotional benefits of PA.¹⁹ Even though it is anticipated that the students will learn to enjoy the walking, and even look forward to it, an additional incentive will be the use of an award for the class that walks the most steps each month. By counting the total number of steps taken from the pedometers, the winning class will get to have a (healthy) pizza party in their classroom after recess, i.e. pizza made with whole wheat crust and low fat cheese.

Component #2: Physical Education Class

The second component of this program, a Physical Education (PE) instructional class, will shift the focus of the current PE curriculum away from providing time for exercise to providing students with

skills-based instruction and exposure to diverse activities. The current PE curriculum at the Baldwin School is designed to provide students with the opportunity for PA, however, students will now be engaging in the recommended amounts of PA during the walking recess (Component 1). Since PE class already exists in the regular school-day schedule, the second component of the program is not an institution of a new period, rather, it is a replacement of the PE curriculum, and thus will remain mandatory for students.

The purpose of this component is to provide students the opportunity to discover activities they enjoy, as well as activities for which they have an increased aptitude. Therefore, the emphasis for the new PE class will be on enabling students to gain exposure to a comprehensive variety of physical activities as well as practical knowledge and experience in performing specific skills and activities. Key learning objectives, such as to articulate facts about PA and healthy weight, will be also be taught during the first six classes of PE instruction. Additionally, the specific benefits of individual activities, as well as recognizing when a natural ability is present for certain activities will be worked into every class to help the students believe that everyone can participate in and enjoy PA.

The instruction will be in as many areas of PA as possible – covering moderate and vigorous, competitive and participatory, and athletic and entertainment activities. There are two levels of instruction that will be taught to the students – the overall PA or sport and the specific skills needed to perform the activity. Students will be instructed in a variety of types of activities such as: cardio and nautilus equipment, field and court sports, aquatics, combat arts, studio activities, ice and snow activities, gymnastics, playground activities, racquet sports, track and field, around the house activities, golf, cycling, and boating. Students will be taught a total of 45 different activities; a complete Table of Physical Activities follows in Appendix C. Through instruction of these different activities, students will learn a variety of specific skills, including: running, jumping, kicking, throwing, catching, hitting (a ball), balancing, stretching, lifting, etc.

Appendix C lists the activities in the order in which they will be taught during the school year, names the overarching category of the activity, indicates if the activity is available as a high school sport and during which season it is competed, specifies the number of classes spent on each activity, as well as identifies the classifications of the activity.¹⁵ PE classes meet 80 times throughout the school year,

and each student has PE class twice per week.¹⁶ While classes have been arranged to align with indoor/outdoor needs, they can be reordered to accommodate weather influences.

Students will proceed to gym class as usual, and will be expected to come to class prepared to participate in appropriate attire, just as is currently stipulated. In class, the regular PE teachers will begin each class with an announcement about the activities and skills to be covered in class that day. Next, teaching will begin with the first level of instruction, followed by the second level. For example, for the two class periods during which soccer is taught, classes seven and eight, the first level of instruction will include information on how playing soccer can be a source of both moderate and vigorous activity, how it can be played competitively as well as participatorily, and how soccer is both athletic and entertaining. Students will also learn about the rules of the game, equipment used, and where and when soccer is played. The second level of instruction will focus on the specific skills used to play soccer, such as running with the ball, receiving, passing, shooting, corner kicks, and throwing-in the ball. Lastly, teachers will then highlight students' successes with the skills and activity. Students' participation in this component will primarily consist of attempting and demonstrating new skills, using time remaining after instruction for practicing.

The new PE curriculum will utilize the current PE teachers at the Baldwin school. However, the PE teachers will be teaching more activities now than they have been under the current curriculum. Cambridge Moves will assist in the training and proficiency of the PE teachers on the new curriculum's activities and skills, as well as with providing equipment and materials needed.¹⁷

In order to help reinforce the skills and facts learned during PE class, students will receive handouts about the activities at the end of each series of classes. These handouts will be simple descriptions of the activity each on one double-sided page, including information such as what the activity is, a summary of the rules of the game (if applicable), equipment used, the skills used and performed, where and when you can do the activity, who you can do the activity with, and the benefits of the activity. At the top of each sheet, there will be a space for the students to rate the activity, on a scale of one to five, on how much they enjoyed the activity, how well they think they did at performing the activity, and if they think they would like to participate in the activity again. By the end of the school-year, each student will have assembled a comprehensive binder of all the activities they have learned, similar to other

academic subjects. The goal is to promote that physical education is as important as other subjects taught in school, as well as to generate student endorsement for the component by summarizing key points along with elucidating student interest and performance. Students will be graded in PE class based on their level of effort made.

Future expansion of the second component could involve the inclusion of additional activities for instruction, such as hiking, ropes/adventure courses, rock wall climbing, downhill skiing and snowboarding, mountain biking, and bowling. The breadth of exposure to PA in the PE class would support the establishment of after-school activities where the activities taught in PE class could be offered in an after-school, recreational setting. The students would be able to apply the knowledge and skills gained during PE class to a more in-depth experience of those activities that appealed to them most, allowing them to form bonds with those activities as well as with other students who share their own potential and interest in an activity.

Adoption, Implementation, and Maintenance

Adoption

In order to enact the program, support will need to be garnered from stakeholders, gatekeepers, and decision makers. These groups are the early adolescents, the parents and guardians, teachers in the school, and school administrators in the district. Health communication will be the primary intervention technique used to reach these groups for adoption, utilizing the media as well as meetings and workshops. Table 1 summarizes the stakeholder groups, their adopter categories, and the method to be used to garner their support.

Table 1.

Stakeholder Group	Anticipated Adopter Category	Method of Presentation
Early Adolescents	Majority – Late Adopters	Media
Parents/guardians	Majority	Media, Group Meetings
Teachers	Majority	Media, Group Meetings
School Administrators	Early Adopters	Individual Meeting

As the primary stakeholders, early adolescents will also be targeted with support-garnering activities. Advertisements will seek to get early adolescents’ support of physical activity in general, in order to reduce resistance to the program in the school.

As stakeholders, parents and guardians will be solicited to advocate for the policy change, since their support can affect its acceptance. Brochures and pamphlets will be designed using a “Touching Hearts, Touching Minds” approach, an innovative strategy being implemented by the WIC program using emotion-based messages to promote healthy behaviors.²⁰ Messages like, “Walking can take you further than just the corner store, it can get you to old age” will emphasize the physical benefits of walking without sounding like medical advice. Different parents and guardians will fall into different adopter categories, likely following the traditional bell-shaped curve, with most falling into the majority category.

As stakeholders and gatekeepers, teachers will be solicited to support the policy change. Since teachers will be the people administering the program to the students, their support is crucial in order to adopt the program. Teachers’ involvement in students’ lives is more than as educators; teachers are role models as well as adults who are concerned about students’ well-being. The “Touching Hearts, Touching Minds” approach will be used with teachers too, to present a holistic view of the students’ educations. Different teachers will fall into different adopter categories, however it is expected that teachers will mostly be in the majority category.

As gatekeepers and decision makers, school administrators will be solicited to adopt the policy change. The Baldwin School Principal, Mary Eirich, is the primary gatekeeper and decision maker who will need to support the program adoption.¹⁶ Ms. Eirich will be approached individually to at an early stage to gain her support from the outset. Ms. Eirich’s earnest concern for the health and well-being of members of her school’s community will likely make her an early adopter of the program.

The logistical champion for the program will be Dr. Thomas Fowler-Finn, the Superintendent of Schools for CPSD.¹⁵ Dr. Fowler-Finn, along with the City of Cambridge’s Healthy Children Task Force (HCTF), was an Innovation in Prevention Award recipient at the 2007 National Prevention and Health Promotion Summit in Washington, DC.²¹ The Healthy Living Cambridge Kids program won the award in the Schools (K-12) category.²¹ The Innovation in Prevention Awards identify and celebrate outstanding organizations that have implemented innovative and creative chronic disease prevention and health promotion programs.²¹ Dr. Fowler-Finn has demonstrated his commitment to the health of children in the city of Cambridge, as well as for innovative ideas to solve community problems, and is therefore ideal as the logistical champion as both an innovator and a community leader.

An iconic champion may not be necessary for the program, due to the small scope of the intervention in the pilot implementation. However, Shaquille O'Neal would be an appropriate choice since starting his "Shaq's Big Family Challenge" program.²² Mr. O'Neal's intervention is implemented as a television program on the ABC Network, with the goals of teaching kids how to eat better, live healthier, and lose weight.²² The program outlined in this document is directly aligned with Mr. O'Neal's program goals.

Opposition to adopting the program will likely arise from objections about the additional funding required. Resources needed for Component 1 are money for paying the teachers to supervise the walking recess, pedometers for teachers and students, "Today I Feel" Faces magnets, and supplies for pizza parties. Resources needed for Component 2 are training for PE teachers on the new curriculum, equipment and supplies for the activities taught in class, handouts for the students about the activities, binders for the handouts, and possibly outside facilities and staff for activities that are more easily gained access to outside of the school. While costs are not negligible, they are neither extraordinary, and grants will be secured for initial expenses. Objections may also be raised in response to changing the recess and PE class curriculums, however, the health communication techniques described earlier will mitigate these concerns. Media will be used to advertise the program and its benefits to reduce initial concern, and group meetings will be used to address concerns directly from stakeholders.

Implementation

In order to institute the program, staff will need to be trained and supplies will need to be gathered. Initial funding for resources will be secured through the Every Body Move grant, a Massachusetts Governor's Committee on Physical Fitness & Sports (MGCPFS) ongoing initiative to get Massachusetts residents "moving".²³ MGCPFS provides grants to programs that educate children about the benefits of being physically fit and encourage participation in activities that are fun and provide them with positive results.²³ Dr. Robert J. McGowan, Coordinator of Health, Physical Education, & Athletics for CPS, and the two K-8 Physical Education instructors at Baldwin, Jim Edgehill and Mike O'Connell, will coordinate training and acquiring supplies and facilities activities with the help of the Cambridge Moves program.^{15,16,17}

The current PE teachers will be able to continue teaching in the roles to which they are accustomed; however some additional training may be necessary. The strength of Component 2 is the variety of activities to which students are exposed, therefore it is important that the PE teachers have at least a minimum proficiency in each activity. Other teachers or outside personnell may be needed for training, or to facilitate specific classes.. Since the PE teachers will have different backgrounds and different strengths, they can work together and learn from each other, utilizing a modeling approach.

The major challenge will be facilities and equipment for certain activities. Specialty items may be required and collaboration with the community will be necessary. It is not expected that the school will build specialty facilities, rather that local businesses will allow the use of their facilities. “Specialty facilities” refers to facilities and equipment that are not likely to be part of the school’s existing supplies.

Organizational changes to accommodate the program are minimal, with examination of the school-day schedule being the primary undertaking. The lunch schedule will be changed three times per week for the walking recess, and the PE class equipment will need to be updated and expanded. Different schedules may need to be tested to find the most optimal. It is anticipated that students and teachers may have difficulty adjusting, however, they will likely become more efficient and accustomed after an initial acclimation period.

Maintenance and Sustainability

The program can be sustained over time with minimal funding, so long as it has continued support from stakeholders, gatekeepers, and decision makers. Successful outcomes are expected to garner persisting support and promotion of the program. Administrators will need to preserve the program’s activities though, in order to have the opportunity to discern positive results. Dr. McGowan will be responsible for assuring program fidelity.

Evaluation and feedback are essential in maintaining any program, to allow for improvements in process. Therefore, focus groups will be conducted at the end of the school-year to discover participants’ viewpoints. Students, teachers, and PE instructors will be requested to provide their perspectives. Focus groups will also help unite participants, and build partnerships for program enhancement.

Long-term funding will be sought from the Commonwealth of Massachusetts, to integrate the program into the yearly budget for public school education. The more schools in which the program is implemented, the more collaboration that will be taking place, and thus the cost per school will decrease.

Early adolescent overweight and obesity are growing problems in our country, state, and city. Cambridge, MA finds itself in 2005 with higher overweight and obesity rates than Boston, Massachusetts, and the U.S.^{1,2} PA is one of the most easily modifiable behaviors that can help address the problem, as well as have many other beneficial effects.^{9,10} While there is a deficiency of research on walking effects on children and adolescents, this program hopes to establish new best practices in the area, by being proactive about the problem, and not just reactive. We are not just creating healthy kids, but helping them grow into healthy adults.

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Appendix A. Performance, Learning, and Change Objectives

PERFORMANCE OBJECTIVE 1: Early adolescents in grades 6 – 8 will engage in the recommended amounts of physical activity.	
Personal Determinants	LEARNING OBJECTIVES
Knowledge	a. Define the two types of physical activity b. List different ways to get physical activity c. Enumerate and explain the benefits of physical activity – physical, mental, and emotional
Attitudes	d. Believe physical activity can be fun and enjoyable e. Recognize that physical activity can be easy f. Describe being physically inactive as embarrassing g. Appreciate short & long term effects of physical activity
Subjective Norms	h. Express belief that others feel they are “cool” by participating in physical activity i. Recognize and agree that most people who engage in physical activity enjoy doing it
Behavioral Skills	j. Incorporate physical activity into part of daily routine k. Report the “good feeling” experienced after participating in physical activity l. Encourage others to participate in physical activity with them (find a work-out buddy)
Outcome Expectations	m. Expect to experience benefits both now and later n. Expect physical activity to be fun and want to do it again
Perceived Behavioral Control	o. Express confidence in ability to perform and participate in physical activity p. Express confidence in ability to continue engaging in physical activity in the long term
Cues to Action	q. Set an alarm to remind when it is time to exercise r. Keep a schedule/calendar of physical activity times s. Work-out buddy signals it is time to exercise
External Determinants	CHANGE OBJECTIVES
Interpersonal	a. Parents/guardians recognize physical activity as a major component of overall health b. Parents/guardians engage in physical activity c. Peers participate in various forms of physical activity
Institutional	d. School Physical Education Dept. and Principal work together to provide more school-based opportunities for participatory physical activity e. School Health Education dept. works to make school-offered physical activities more appealing and related to class instruction
Community	f. Neighborhood Recreational Centers offer more types of structured physical activity - participatory & competitive g. Town/city institute programs promoting physical activity
Culture/Society	h. Regular physical activity becomes part of the norms of society, with inactivity frowned upon

	<ul style="list-style-type: none"> i. State legislatures strengthen existing public school physical activity requirements (policy development) j. State legislatures develop better infrastructure and funding for public school-based physical activity
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PERFORMANCE OBJECTIVE 2: Parents and guardians will support and encourage physical activity programs in schools that promote healthy weight in early adolescents.	
Personal Determinants	LEARNING OBJECTIVES
Knowledge	<ul style="list-style-type: none"> a. Define the two types of physical activity b. List different ways to get physical activity c. Enumerate and explain the benefits of physical activity – physical, mental, and emotional
Attitudes	<ul style="list-style-type: none"> d. Believe physical activity can be fun and enjoyable e. Recognize that physical activity can be easy f. Describe being physically inactive as embarrassing g. Appreciate short & long term effects of physical activity h. Believe that schools are ideal for getting physical activity
Subjective Norms	<ul style="list-style-type: none"> i. Express belief that others will think their child is “cool” by participating in physical activity j. Recognize and agree that most people who engage in physical activity enjoy doing it
Behavioral Skills	<ul style="list-style-type: none"> k. Incorporate physical activity into child’s daily routine l. Recognize that child feels good after participating in physical activity m. Encourage child to participate in physical activity, and offer incentives to do so n. Encourage child’s friends to participate in physical activity all together (use work-out buddy/ies & teams)
Outcome Expectations	<ul style="list-style-type: none"> o. Expect peers (other adults) to support physical activity p. Expect child to experience benefits of physical activity both immediate and long-term q. Expect child to feel better about self and perform better in school
Perceived Behavioral Control	<ul style="list-style-type: none"> r. Express confidence in child’s ability to perform and participate in physical activity s. Express confidence in child’s ability to continue engaging in physical activity in the long term t. Express confidence in ability to encourage child to participate in physical activity
Cues to Action	<ul style="list-style-type: none"> u. Set an alarm to remind when it is time to exercise v. Keep a schedule/calendar of physical activity times/seasons
External Determinants	CHANGE OBJECTIVES
Interpersonal	<ul style="list-style-type: none"> a. Peers, and their own children, recognize physical activity as an important component of overall health b. Peers and peers’ children participate in variety of physical activities

Institutional	<ul style="list-style-type: none"> c. School Physical Education Dept. works to provide more school-based opportunities for participatory physical activity (improve variety and availability) d. School Health Education Dept. works to make school-offered physical activities more appealing and related to class instruction
Community	<ul style="list-style-type: none"> e. Neighborhood Recreational Centers offer more types of structured physical activity - participatory & competitive f. Town/city institutes programs promoting physical activity
Culture/Society	<ul style="list-style-type: none"> g. Regular physical activity become part of the norms of society, with inactivity frowned upon h. State legislatures strengthen existing public school physical activity requirements (policy development) i. State legislatures develop better infrastructure and funding for public school-based physical activity

PERFORMANCE OBJECTIVE 3: School administrators will support and employ physical activity programs in schools in order to promote healthy weight in early adolescents.	
<i>Personal Determinants</i>	<i>LEARNING OBJECTIVES</i>
Knowledge	<ul style="list-style-type: none"> a. Define the two types of physical activity b. List different ways to get physical activity c. Enumerate and explain the benefits of physical activity – physical, mental, and emotional
Attitudes	<ul style="list-style-type: none"> d. Believe physical activity can be fun and enjoyable e. Recognize that physical activity can be easy f. Describe being physically inactive as embarrassing g. Appreciate short & long term effects of physical activity h. Believe that schools are a great place for children to get physical activity
Subjective Norms	<ul style="list-style-type: none"> i. Express belief that children are “cool” by participating in physical activity j. Recognize and agree that most people who engage in physical activity enjoy doing it
Behavioral Skills	<ul style="list-style-type: none"> k. Incorporate physical activity into children’s daily routine l. Recognize that a child feels good after participating in physical activity m. Encourage children to participate in physical activity, and offer incentives to do so n. Encourage children’s friends to participate in physical activity all together (use work-out buddy/ies and teams)
Outcome Expectations	<ul style="list-style-type: none"> o. Expect peers (other adults) to support physical activity p. Expect children to experience benefits of physical activity both immediate and long-term q. Expect children’s teachers to support healthy weight through physical activity
Perceived Behavioral Control	<ul style="list-style-type: none"> r. Express confidence in children’s abilities to perform and participate in physical activity

	<ul style="list-style-type: none"> s. Express confidence in children’s abilities to continue engaging in physical activity in the long term t. Express confidence in ability to encourage children to participate in physical activity
Cues to Action	<ul style="list-style-type: none"> u. Use structure of school day to signal physical activity times v. Keep a schedule/calendar of physical activity times/seasons
External Determinants	CHANGE OBJECTIVES
Interpersonal	<ul style="list-style-type: none"> a. Peers, and their own children, recognize physical activity as an important component to overall health b. Peers and peers’ children participate in various forms of physical activity
Institutional	<ul style="list-style-type: none"> c. School Board imposes regulations requiring increased physical activity to promote healthy weight in students d. School Physical Education Dept. works to provide more school-based opportunities for participatory physical activity e. School Health Education Dept. works to make school-offered physical activities more appealing and related to class instruction
Community	<ul style="list-style-type: none"> f. Neighborhood Recreational Centers offer more types of structured physical activity - participatory & competitive g. Town/city institutes programs promoting physical activity
Culture/Society	<ul style="list-style-type: none"> h. Regular physical activity become part of the norms of society, with inactivity frowned upon i. State legislatures strengthen existing public school physical activity requirements (policy development) j. State legislatures develop better infrastructure and funding for public school-based physical activity