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KEEPING A STEP AHEAD - FORMATIVE PHASE OF A WORKPLACE INTERVENTION TRIAL TO PREVENT OBESITY

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Abstract

Background—Ecological interventions hold promise for promoting overweight and obesity prevention in worksites. Given the paucity of evaluative research in the hospital worksite setting, considerable formative work is required for successful implementation and evaluation.

Purpose—This paper describes the formative phases of Step Ahead, a site-randomized controlled trial of a multi-level intervention that promotes physical activity and healthy eating in 6 hospitals in central Massachusetts. The purpose of the formative research phase was to increase the feasibility, effectiveness and likelihood of sustainability of the intervention.

Design and Procedures—The Step Ahead ecological intervention approach targets change at the organization, the interpersonal work environment and the individual levels. The intervention was developed using fundamental steps of intervention mapping and important tenets of participatory research. Formative research methods were used to engage leadership support and assistance and to develop an intervention plan that is both theoretically and practically grounded. This report uses observational data, program minutes and reports, and process tracking data.

Developmental Strategies and Observations—Leadership involvement (key informant interviews and advisory boards), employee focus groups and advisory boards, and quantitative environmental assessments cultivated participation and support. Determining multiple foci of change and designing measurable objectives and generic assessment tools to document progress are complex challenges encountered in planning phases.

Lessons Learned—Multi-level trials in diverse organizations require flexibility and balance of theory application and practice-based perspectives to affect impact and outcome objectives. Formative research is an essential component.

Keywords

formative research; worksite interventions

Background and Purpose

Obesity is a public health problem which has reached epidemic levels.(1,2) A population approach strongly emphasizes the need to explore changes in obesogenic environments.(3) Interventions which target multiple levels of the policy, sociocultural and structural environments are promising approaches to addressing this issue, and worksites are a potentially important setting for this research.(4) Step Ahead is being conducted at six hospitals in Central Massachusetts. Hospitals are attractive worksites for intervention because they employ large numbers of people who are socioeconomically and racially diverse yet share common physical, social and policy work environments. Further, hospitals, regardless of size, have general workforce similarities with respect to types of departments, professional and support staff job types and unionization of workforce segments. Since hospitals are the largest employers in many communities, and are the second-largest employer in the private sector,(5) research findings are potentially generalizable across the country.

Extensive planning and formative research is a key phase in the successful development and implementation of complex, multi-level, theory-based intervention trials.(6) Formative research is typically conducted during development or refinement of a program with the intent to improve feasibility, effectiveness and likelihood of sustainability.(7–9) Formative research uses qualitative and quantitative methods to provide data on participants' and stakeholders' opinions about, reactions to and participation in intervention activities and allows investigators to modify initial assumptions and planned objectives, strategies and messages. This article reports the planning and formative development phases of the Step Ahead trial.

Step Ahead Development

Study Design

In this site-matched randomized design, the unit of randomization was the hospital. Six hospitals were matched into three pairs according to size (approximate number of employees) and scope of services (e.g. inpatient, outpatient, specialty services). Within matched pair, hospitals were randomized to either the intervention or control condition. The level of inference, however, is the individual employee. The primary end-point of the trial, as stipulated by the NHLBI initiative, was improvement in body mass index (BMI). Effectiveness is assessed in a representative cohort of employees who complete assessments at four time points.

Paradigm and Framework

Ecological frameworks stress that behaviors are influenced by complex interrelationships of individual characteristics and their social and normative context and, policy and physical environment factors.(10,11) Within the worksite, levels of potential influence are the organization, the specific work unit or interpersonal work environment, and the individual employee. Relevant organizational and behavior change theory constructs and concepts at each level in the development of specific intervention strategies and messages can be considered in this ecologic framework.

Step Ahead incorporates concepts from organizational development theory.(12) For example, intervention strategies are designed to promote leadership support, and to impact organizational processes, actual and perceived norms, and consider organizational climate. Concepts from Diffusion of Innovation Theory(13) are useful in understanding how organizational factors, such as policies and services related to physical activity and cafeteria services within worksites (14), impact the adoption of healthy behaviors.

At the interpersonal work environment level, numerous studies have demonstrated the effect of interpersonal factors on physical activity and healthy diet. Step Ahead intervention strategies

are designed to foster social support related to physical activity and healthy eating within existing social networks (work-based relationships.). (15)

At the individual level, constructs empirically linked with physical activity and/or healthy diet (16) are used to guide specific intervention messages. From Social Cognitive Theory,(17) the constructs of self-efficacy, behavioral capabilities and outcome expectancies are incorporated. Additional constructs include perceived barriers to and facilitators of change from the Health Belief Model(18) and attitudes toward behaviors and subjective norms from the Theory of Reasoned Action.(19)

Intervention Planning and Development

Although planning for Step Ahead began prior to the NHLBI proposal submission, considerable participatory planning and refinement needed to occur post-award, and the Step Ahead proposal included a substantial formative research phase (Figure 1).

The NHLBI required the primary outcomes be defined as change in BMI. Behavior changes were secondary outcomes. In developing our proposal, we undertook behavioral assessment as prescribed by the PRECEDE-PROCEED framework for intervention planning, considering the modifiable predisposing, enabling and reinforcing factors to be addressed by intervention strategies and by messages in the social marketing component. Green and Kreuter(20) define enabling factors as “antecedents to behavior that allow a motivation to be realized”, predisposing factors as “antecedents to behavior that provide the rationale or motivation for the behavior, and reinforcing factors as “factors following a behavior that provide the continuing reward or incentive for the persistence or repetition of the behavior”, (20) While many interventions primarily target predisposing factors, Step Ahead’s ecological emphasis focuses also on enabling and reinforcing factors. This planning assessment included delineation of the specific intervention objectives related to knowledge, attitudes and beliefs and skill, supporting individual change and the changes needed in the environment.(21) These factors then led to strategy and message decisions. Table 1 summarizes the impact and outcome objectives. The evaluation plan included data sources at the organizational and individual levels to monitor achievement of the objectives. These objectives are generally stated, without time frame or target changes as they may vary depending on baseline values and on the expectation that employees will choose behaviors based on individual preference and need. Power for the study was based on an expected intervention effect of a.5 difference in BMI between intervention and control employees. Table 2 lists the preliminary decisions on strategy choices prior to the formative research phase.

Formative Research Questions

Planning was carried out in a three-month period prior to grant submission. Additional planning and formative research occurred during the project’s first year. Kick-off intervention events started in May, 2006, and refinement continued for approximately 6 months. This report of formative evaluation activities covers this time period and addresses the following questions:

1. What elements of the hospital structure, environment and service operations should be considered in the planning and implementation of strategies to impact healthy eating and physical activity?
2. To what extent did leadership involvement in intervention planning and development evolve as expected?
3. To what extent did employee involvement in intervention planning and development evolve as expected?

4. To what extent was the three-level ecological conceptualization of intervention targets and associated strategies accurately grounded in real world circumstances?
5. How were the specific intervention strategies and methods modified? What factors influenced the decisions to make modifications?

Methods

Data Sources and Collection

A number of methods were employed to understand the hospital environment and cultivate participation in intervention planning and refinement. These methods reflected the iterative process of formative research, in which decisions about next steps were based on information most recently gathered.(22) Briefly, the information sources were:

Environmental assessment—At each hospital (intervention and control) assessments were completed by trained research staff using structured checklists. The Checklist of Health Promotion Environments at Worksites(23) was abbreviated and tailored to the hospital setting to describe components of the hospital environments related to opportunities for physical activity and healthy eating. The checklist included vending machine inventories (location, price, contents), weight control and fitness resources, indoor and outdoor physical environment, neighborhood characteristics and cafeteria assessments.

Leadership key informant interviews and advisory groups—Prior to proposal submission, key informant interviews were conducted with top leadership at all sites to gain support and agreement to participate. After randomization, leadership advisors were identified at the intervention sites. These hospital leaders and decision-makers either volunteered or were asked to serve upon the recommendation of the local president to provide ongoing direction and support for intervention implementation.

Employee focus groups—Seven focus groups were conducted post-award at the intervention sites only. In the largest hospital, groups were formed according to work units.

Employee advisory boards (EAB)—Advisory board members were recruited from the focus groups and during the initial intervention kick-off phase. Volunteers were solicited, and departments with a mission related to the research study such as a weight center, fitness center, cardiac rehabilitation center and the dietary departments are heavily represented.

Documentation logs—A variety of tracking logs, such as leadership advisory group and key informant logs, provided data on decisions made and next steps.

Data Analysis

Analysis of environmental assessments involved site-specific descriptive statistics, including frequencies, range and means. Data from other sources (focus groups, key informants, and the advisory meetings) were qualitative. The process was iterative with observations from one source synthesized and used to inform subsequent proceedings. Data from all sources were triangulated to make strategic decisions about process, strategy format and material content.

Observations and Lessons Learned by Research Question

1. Description of hospital structure, environment and service operations

Coupled with leadership interviews, a structured environmental assessment was done at all 6 hospitals. Match was done on scope of service and employee workforce size. Data on the three intervention hospitals are reported in Table 3.

2. Leadership involvement in intervention planning and development

At all six hospitals, the “buy in” at upper level of administration was enthusiastic, even with the potential for randomization to the comparison condition. Leadership quickly agreed to participate and approved access to Human Resources data for the employee evaluation component. Top leadership participation evolved from formal meetings to a less formal process. First, the Principal Investigator spent considerable time in one-on-one and small group meetings, explaining goals, exploring options and building rapport. The time and energy needed at each hospital reflected the size and complexity of the organization. Sixteen top management meetings aimed at cultivating buy-in or information and planning were held at hospital A, while 6 and 3 meetings were held at the smaller hospitals, B and C. Subsequently, the hospital leadership recommended key managers and other staff to serve as “implementers”. The enthusiasm suggests that Step Ahead was “in the right place at the right time”. Nationally, hospitals have done very little to promote healthy eating and physical activity among their employees despite their mission to improve health. Step Ahead was perceived as a positive “good news” effort compared to other pressures on hospitals and employees related to budget cuts, consumer demands, regulations etc.

The “top down” approach of first engaging the support of top leadership was important. Strong leadership support was made clear to cafeteria and facilities middle management and staff members, whose cooperation was needed to implement changes. Fourteen additional meetings were held with mid-management and managers (9, 3 and 5 respectively at Hospitals A, B and C). These included facilities, food services and fitness center managers. The time it took to understand the dynamics between the hospital and contracted (food) services and who had the leverage to make decisions varied among the hospitals, and accounts for most of the variability in the number of meetings required. Staff turnover and communication difficulties were also encountered. While we were prepared for variable response from union leaders, the leadership’s introduction and support of the project paved the way for cooperation.

Consistent with theories of organization development, factors of size and service line were important in the planning process.⁽²⁴⁾ In general, the larger and more complex the organizational structure, the less transparent the decision-making and communication processes. Leadership at the smaller hospitals at times took a more hands-on approach to intervention idea development, suggesting topics and providing community contacts and resources. At one hospital (C), upper management was located on a different campus. Employee perception was that upper management strongly favored the other campus resulting in part from this arrangement. Step Ahead programs were welcomed by management as a way to give something special to employees.

3. Employee Involvement in Intervention Planning and Development

Several consistent themes emerged across all *focus groups*. Overall the groups were enthusiastic about the project. At the largest hospital, housekeeping staff comprised one focus group and the other consisted of members of a large union representing clerical workers, lab technicians, and nurses’ aides. Efforts to recruit nurses for focus groups at this hospital were unsuccessful. One focus group was conducted at each of the two smaller hospitals. All staff were invited to these groups rather than working through a union or specific department, but

as it happened, almost all participants at the other two campuses were nurses. Focus group members identified that lack of time to participate in activities was a potential barrier, especially for clinical staff members with little control over their schedules. Preferences for content offerings clearly favored nutrition-related topics, with the availability of food samples considered very appealing. There was strong opinion that the term “physical activity” was preferred, as the term “exercise” was viewed negatively. Other than a workshop devoted to strength training, there was only moderate endorsement for workshops about physical activity. Campaigns or contests promoting physical activity, as well as nutrition topics, were recommended. Suggestions included having multiple ways to report on progress (e.g. handwritten logs, on-line reporting), options for group or individual participation, incentives for signing up and prizes at the end.

Environmental or contextual events served either to distract response to or promote enthusiasm for Step Ahead activities. For example, at two hospitals the food services contractor implemented a new more patient-friendly inpatient meal program. This initially took priority over working with Step Ahead to implement cafeteria changes. As another example, one hospital demolished its cafeteria early in the intervention period and replaced it with a new and centrally located cafe. This allowed the project staff to work with the food services director and chef at the planning stage to implement healthy cafeteria intervention strategies. These included incorporation of signage with nutrition information, and offering and promoting healthy foods. Renovations in one hospital’s fitness center also promoted support of Step Ahead activities by its staff, who viewed Step Ahead activities as a way to enhance employee enthusiasm for exercise and fitness.

Employee advisory boards meet on a quarterly basis. Participation among employees with “professionally relevant” positions and departments, i.e. weight centers, fitness facilities or nutrition/dietitians has been heavy from the beginning, particularly at the largest hospital. While generally very constructive, these experts could be intimidating to other interested employees who do not have job roles related to diet and exercise. This latter group is often motivated by an interest in “losing weight” rather than in fitness or nutrition. There has been generally less participation by housekeeping staff overall and among nurses at the largest hospital, highlighting that those with more job task and time flexibility were likely to be involved in the advisory groups. To compensate, project staff members consistently try to capitalize on opportunities to interact with individuals or small groups when opportunities arise, such as at Quick Tips tables or Farmers’ Markets, asking people who seem interested in Step Ahead for feedback and suggestions.

4. Conceptualization of activity at three levels and initial response

The initial conceptualization of the three levels of the ecological model appears to be appropriate. The response at the organizational level as noted above was positive, but implementation was time consuming. For example, design and structure of wall racks and sign holders were required to adhere to varying physical plant policies. Challenges to conducting a site-randomized controlled trial in hospitals within the same system also became evident. Email communications had never been created for individual campuses and considerable work with the Information Systems staff was required to develop hospital-specific email distribution lists to intervention sites. Another strategy, the creation of an employee benefit for participation in Step Ahead, could not be implemented because of legal barriers to offering benefits only to selected campus. This might be feasible outside of the context of a randomized trial.

Activities at the work unit level have been slower to evolve, in part due to staffing limitations for this resource intensive approach. Certain project activities, however, promoted work unit enthusiasm. A notable example was the walking challenge, for which most teams drew members from a single department. Participants reported feeling a greater sense of cohesion

among coworkers. We also learned that for some employees their “social network within the work setting” can be an asset to participation in Step Ahead activities. Staff in different work units who commute to work together or live in the same neighborhood, for example, can influence each other to engage in Step Ahead events.

Intervention activities and messages must obviously be designed with individual level as well as social factors in mind. Preliminary response to the Step Ahead website and weekly newsletter has been very enthusiastic. The reach and impact of these materials will be judged as part of the ongoing process documentation and evaluation activities.

5. Modification of specific strategies and messages

The “small steps” approach clearly resonated with leadership and employees. Few modifications have been made to the initial intervention activities. Initial workshops met with mixed success, in part due to the reality that even a 30-minute program is too long for an employee who gets a 30-minute break. The workshop with the most enthusiastic initial response at all hospitals teaches strength training using resistance bands; The first workshops were attended by 33, 18 and 19 persons at the large, medium and small hospitals, respectively. Interest in the program has continued at the large hospital with an average of 10 persons attending a session each month. New attendees report they “heard about it from a co-worker”. At the other two hospitals, interest is still expressed but at a lower level, in part reflective of the smaller workforce. Response to workshops on other topics, such as quick and healthy dinners has been low or nil. A “cafeteria tour” prompted no response. Attendance at workshop events at times other than lunch break for day shift has been marginal at best. The first strength training workshops offered at the two smaller campuses were scheduled for mid-to-late afternoon around shift change time, and were very well attended. Thereafter, few if any employees attended in that time slot. Sessions held early in the morning, around shift change time, have never drawn more than a handful of participants. As result of the variable success, a “Quick Tips Table” strategy was developed, in which workshop content was transformed into a display format and materials were made available for employees to take with them. For example, an excellent and engaging information packet was developed by the nutrition specialist for the quick and healthy dinners workshop. It contained practical and scientifically sound advice for meal planning, shopping and kitchen stocking; portion size and food safety information, and seven dinner menus with an entrée recipe for each. A PowerPoint slide show highlighting the packet contents was shortened and modified for use as a display staffed by Step Ahead, and a cold entrée introducing beans was available for samples. The Healthy Holidays packet and display included a chart contrasting traditional high- fat and high-calorie holiday fare with healthier alternatives and recipes. Also included were recipes for holiday leftovers and suggestions for increasing physical activity during the holidays. Samples of reduced calorie pumpkin pie were very popular. The “Move Indoors!” display includes information about active living during the work day, and about duration, frequency and intensity of exercise and the importance of aerobic and strength training. Handouts include sheets on how to choose athletic shoes and exercise videos, an information and resource sheet on strength training and a variety of commercially produced pamphlets on starting exercise programs. Depending on the display location and traffic flow, a project staff member sometimes demonstrates a strength training routine using stretch bands, which usually draws a crowd. This approach has been very successful during coffee breaks, lunch hours and shift change hours.

As the project became more visible and networks were established, staff learned of new opportunities that included collaboration with existing groups and activities. For example, a table at a benefits fair for employees generated an enthusiastic response of about 75 persons. Participation in employees benefits fairs was then successfully cultivated at the other two

hospitals. There are more opportunities for collaboration at the largest hospital, an academic hospital, including programs in conjunction with the fitness center and the library (a movie about a nutrition-related topic with a follow-up discussion.)

At the community level, collaborative relationships were also established. The regional Farmers' Market organization was approached, leading to a wonderful weekly event at one hospital's commons area. At another, smaller hospital, one local farmer eagerly responded to an invitation to set up a stand once a week on the campus and has been very well received. To establish a firm connection between Step Ahead and the Farmers' markets in the first year, there was always a staffed Step Ahead table complete with seasonal food samples and recipes. Many "repeat visitors" to the table were observed, frequently bringing a co-worker.

The strategy of periodic campaigns was refined with the input of employee advisory groups and focus groups, who emphasized the attraction of rewards and prizes for all participants. This feature was incorporated into all campaigns. The first campaign focused on physical activity. Although walking was a central theme, the advisory groups suggested that the campaign include methods for recording all types of activity. This flexibility was a very popular feature. Across the three intervention hospitals, 243 persons signed up and 139 submitted six weeks' worth of "step" totals and/or exercise time. A total of 16,678 miles were walked. In conjunction with this campaign, Fitness Fairs were held with displays and activity sessions led by project staff and local outside groups (e.g. yoga, martial arts). Hospital (A) experienced the greatest turnout, possibly due to the ability to hold the event in a very visible, high traffic area and having a larger population. Despite smaller turnout, the other sites were interested and appreciated the event.

Concluding Remarks

A key challenge in this worksite intervention trial is the organizational complexity of hospitals, which include the use of contractors for some services, several different unions, and affiliations with a larger medical system. Hospital size and structure were important to consider in tailoring the intervention program. In some cases, identifying key implementation leaders was difficult. Once this is achieved, however, an advantage of working with hospitals is that there is a general belief in wellness and a conceptual understanding of the importance and procedures of research among leadership.

The ecological framework of the intervention, focusing on the organizational, work unit and individual levels, is proving to be sound. While specific objectives (Table 1) and intervention components (Table 2) are consistent across sites, implementation of specific strategies must vary according to organizational characteristics of each hospital.

This formative phase has identified several challenges. One is lower participation among employees who work the evening and night shifts. Employees come to work very close to shift start and leave immediately at shift end. The cafeterias are closed, or they are open with greatly reduced hours and service. There is little activity there or in other common areas compared to the day shift, suggesting there may be more success with a focus on the work unit, although that approach, is considerably more resource intensive.

The Step Ahead initiative fosters institutionalization of the intervention. Two potential approaches are used. The first requires designated staff members in departments such as Employee Health or Human Resources to oversee and implement the comprehensive program or selected components of it. The second, possibly unique to hospital settings, is finding opportunities for "mutual interest" with departments such as the fitness center, cardiovascular program, or weight center. The presence and role of professional nutritionists in hospital food services may also help to institutionalize strategies offering healthy choices. An approach

utilizing several departments could result in a program that is fragmented. We are also cognizant that allocation of funds for employee prevention programs will be difficult to achieve in the current tight fiscal environment of the health care sector, and long-term sustainability will be a challenge.

In conclusion, the Step Ahead program was developed to promote healthy eating and increased physical activity by hospital employees through addressing multiple levels of influence on behavior using a social ecological framework. The longitudinal evaluation will document whether process, impact and outcome objectives are achieved.

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References

1. State-specific prevalence of obesity among adults--United States, 2005. *MMWR Morb Mortal Wkly Rep* 2006 Sep 15;55(36):985-8. [PubMed: 16971886]
2. Ogden LC, Carroll, et al. Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA* 2006 Apr 5;295(13):1549-55. [PubMed: 16595758]
3. Lake A, Townshend T. Obesogenic environments: exploring the built and food environments. *The Journal of the Royal Society for the Promotion of Health* 2006;126(6):262-7.
4. Katz LD, O'Connell, et al. Public health strategies for preventing and controlling overweight and obesity in school and worksite settings: a report on recommendations of the Task Force on Community Preventive Services. *MMWR Recomm Rep* 2005 Oct 7;54(RR10):1-12. [PubMed: 16261131]
5. Beyond Health Care. The Economic Contribution of Hospitals. [web site] 2006 [cited 2007 May 2, 2007]. Available from: <http://www.aha.org/aha/content/2006/pdf/ECONRPT3.pdf>
6. Gittelsohn J, Steckler, et al. Formative research in school and community-based health programs and studies: "state of the art" and the TAAG approach. *Health Educ Behav* 2006;33(1):25-39. [PubMed: 16397157]
7. Scriven, M. *Evaluation Thesaurus*. 4. Newbury Park, CA: Sage Publications; 1991.
8. Worthen, BR.; Sanders, JR.; Fitzpatrick, JL. *Program Evaluation: Alternative Approaches and Practical Guidelines*. New York, NY: Longman; 1997.
9. Valente, TW. *Evaluating Health Promotion Programs*. New York, NY: Oxford University Press; 2002.
10. Sallis, FJ.; Owen, N. Ecological models of health behavior. In: Glanz, K.; Lewis, MF.; Rimer, KB., editors. *Health Behavior and Health Education: Theory, Research and Practice*. 3. San Francisco, CA: Jossey-Bass Publishers; 2002. p. 462-84.
11. Linnan A, Sorensen L, et al. Using theory to understand the multiple determinants of low participation in worksite health promotion programs. *Health Educ Behav* 2001;28(5):591-607. [PubMed: 11575688]
12. Steckler, A.; Goodman, RM.; Kegler, MC. Mobilizing Organizations for Health Enhancement: Theories of Organizational Change. In: Glanz, K.; Lewis, MF.; Rimer, KB., editors. *Health Behavior and Health Education*. 3. San Francisco: Jossey-Bass; 2002. p. 335-60.
13. Rogers, ME. *Diffusion of Innovations*. 4. New York, NY: Free Press; 1995.
14. Witte K. Managerial style and health promotion programs. *Soc Sci Med* 1993 Feb;36(3):227-35. [PubMed: 8426966]
15. Heaney, CA.; Israel, BA. Social networks and social support. In: Glanz, K.; Rimer, KB.; Lewis, FM., editors. *Health Behavior and Health Education: Theory, Research and Practice*. 3. San Francisco, CA: Jossey-Bass; 2002. p. 185-209.

16. US Department of Health and Human Services. Physical activity and health: A Report of the Surgeon General. Atlanta, GA: U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; 1996.
17. Bandura, A. Social Foundation of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice-Hall; 1986.
18. Hochbaum, GM. Public Participation in Medical Screening Programs: A Sociopsychological Study. Washington, D. C: U. S. Government Print Office; 1958. Report No.: 572
19. Glanz, K.; Rimer, KB.; Lewis, FM., editors. Health Behavior and Health Education. Theory, Research, and Practice. 3. San Francisco, CA: Jossey-Bass; 2002.
20. Green, LW.; Kreuter, MW. Health Promotion Planning: An Educational and Ecological Approach. 3. Mountain View, CA: Mayfield Publishing Company; 1999.
21. Bartholomew, LK.; Parcel, et al. Planning Health Promotion Programs: Intervention Mapping. 2. San Francisco, CA: Jossey-Bass; 2006.
22. Cortes ML, Gittelsohn, et al. Formative research to inform intervention development for diabetes prevention in the Republic of the Marshall Islands. Health Educ Behav 2001 Dec;28(6):696–715. [PubMed: 11720273]
23. Oldenburg B, Sallis, et al. Checklist of Health Promotion Environments at Worksites (CHEW): development and measurement characteristics. Am J Health Promot 2002 May-Jun;16(5):288–99. [PubMed: 12053440]
24. Steckler, A.; Goodman, RM.; Kegler, MC. Mobilizing organizations for health enhancement. In: Glanz, K.; Rimer, KB.; Lewis, FM., editors. Health Behavior and Health Education Theory, Research and Practice. 3. San Francisco, CA: Jossey-Bass; 2002. p. 335-60.

Figure 1.
Step Ahead Planning and Evaluation

Table 1
Step Ahead Objectives

Behavioral Objectives Related to Physical Activity and Diet	
1	Significantly increase incidental physical activity during the workday (including use of stairs, walking between campus buildings, and “walking” meetings) and beyond.
2	Increase purposeful exercise during the workday (especially exercise walking at lunch or on breaks at least 3 times per week) and beyond.
3	Increase consumption of fruits and vegetables, legumes, fish, and whole grains, 100% juice and non-caloric beverages. Increase proportion of monounsaturated and omega-3 fatty acids consumed through substitution for saturated and trans-fatty acids during the workday and beyond.
4	Decrease consumption of saturated and trans-fat, fried foods, and refined carbohydrates (high-fat or high-calorie) during the workday and beyond.
5	Reduce portion size during the workday and beyond.
Predisposing Factor Impact Objectives	
1	Improve employees’ value placed on and satisfaction with active lifestyle and healthy diet.
2	Improve awareness of active living concept; environmental constraints on active living; appropriate portion size; healthy food selection at home, work, restaurants, social events and grocery stores; environmental constraints on healthy eating; options for incidental activity.
3	Increase confidence in ability to lead active lifestyle, select healthy diet and overcome barriers.
4	Improve employees’ perception of their own physical and emotional ability to perform their jobs.
5	Improve employee perceptions of the work environment as health-oriented, and increase perceived interpersonal and organizational support for healthy habits.
Organizational Implementation Objectives (enabling and reinforcing)	
1	Further engage and maintain institutional leadership’s verbal and substantive support for physical, policy/procedural and social environment changes.
2	Establish and maintain senior and middle management support for employee physical activity and healthy dietary choices at the department/work unit level.
3	Establish a participatory infrastructure with an advisory committee and employee working groups.
4	Reach consensus on the number, intensity and variety of specific strategies over time which promote and reinforce a norm of pro-health choices.
5	Nurture champions in the work unit and work union to promote active participation in Step Ahead.
6	In year 4, work with leadership, working groups and champions to develop a sustainability and institutionalization plan.

Table 2
Intervention Categories and Specific Examples by Locus

A. PHYSICAL INFORMATIONAL ENVIRONMENT	
1	Signage at all elevator and stair locations, and heavily used avenues to each.
2	Provide appealing publicity and point-of-selection nutrition information signage for cafeteria.
3	Offer healthy food sampling at selected Quick Tips Tables and Farmers' Market
B. LEADERSHIP ENVIRONMENT	
1	Develop participatory infrastructure, including leadership and employee advisory committees at each intervention site (cross-department, encourage union participation).
2	Develop newsletter stories highlighting champions and "success stories" among department, union, organizational and informal leaders
C. POLICY/PROCEDURAL ENVIRONMENT	
1	Work with the food and nutrition services to promote changes in healthy food options, smaller portion options, product placement, point-of-selection nutrition information, and samples.
D. INFORMAL SOCIAL NETWORK ACTIVITIES/INFORMATIONAL	
1	Promote walking clubs via educational materials, newsletter and competitions.
2	Promote "potluck" healthy luncheons among work units at various shifts.
3	Promote recipes of the week.
4	Suggest healthy menu options at local and chain restaurants via print and website.
5	Advertise workshops and Quick Tips Tables, walking clubs, and walking routes through employee e-mails, Information Center and newsletters.
E. SOCIAL MARKETING CAMPAIGN (Also see D. above)	
1	Design priority health messages to address key predisposing impact objectives: <ul style="list-style-type: none"> a. Promote knowledge of incidental work day activity as contributing to energy expenditure. Promote norm of "step counting", make low-cost pedometers and instruction on use. available b. Promote knowledge of walking routes, attitudes about purposeful walking, beliefs about value. c. Promote knowledge of community exercise options through newsletter and Fitness Fair. d. Define active living and promote the link between active living and prevention of overweight and obesity. Emphasize the value for individuals of spending time being physically active. e. Promote incorporation of produce, legumes, low saturated fat and whole grains in diet. f. Promote healthy snack options.
2	Create and maintain Step Ahead website to include a wide range of detailed information about the importance of active living and a prudent diet, including scientific evidence with links to national websites, details of Step Ahead opportunities and materials, and a BMI calculator. Provide details about structured educational opportunities.
3	Conduct a local retailer gift solicitation initiative to support Step Ahead functions..
4	Provide maps and brochures on a) on-campus walking routes, including mileage and step counts; b) local retailers locations, and c) local walking routes and trails in local parks and wildlife sanctuaries.
5	Provide incentives for participation in periodic campaigns, including t-shirts, water bottles, lunch bags, pedometers and raffle prizes.
F. STRUCTURED EDUCATIONAL/SKILL DEVELOPMENT OPPORTUNITIES	
1	Offer tours of the cafeteria.
2	Offer lunchtime and after-hour workshops and Quick Tips Tables.
3	Offer assistance/coaching in forming walking clubs to departments and units.

Table 3
Description of Hospital Workforce and Environmental Characteristics

Scope of services	Hospital A Academic medical center, regional tertiary care center, shares campus with medical school.	Hospital B Inpatient and outpatient medical, surgical and ancillary services.	Hospital C Outpatient specialty services, inpatient rehab and behavioral medicine, tenant organizations.
Employee Characteristics (Fall, 2004)			
Approximate number	3,078	430	295
% female	77.5%	80.5%	85.1%
% non-Hispanic White	88.0%	87.4%	90.5%
Hospital Physical Characteristics			
# buildings	4	1	2
# floors in main building	10	5	5
# stairways	20	5	5
Cafeteria			
Hours of operation	6–11AM, 11:15–10PM	6:30–11AM, 11:30AM–1:30PM, 5–6:30PM	7:30–9:30AM, 11:30AM–1:30PM
Salad bar	Yes	Yes	Yes
Hot entrees	Yes	Yes	Yes
Grill	Yes	Yes	Yes
Pizza	Yes	Yes	Yes
Vending Machines			
# snack	10	2	2
# cold beverage	12	2	3
# hot beverage	1	1	0
# refrigerated foods	1	0	0
# ice cream	1	0	0
Fitness/Weight Control Programs/Opportunities			
On-site Weight Watchers	Yes	No	Occasionally
On-site fitness center	Yes	Cardiac rehab available to staff	No
Deals for local gym	Yes	No	Yes
Shower/changing facilities	Yes	No	No
Basketball court	Yes	No	No
Volleyball court	No	No	No
Walking/training path	No	No	No
Bicycle rack	Yes	No	No
Local Neighborhood			
Sidewalks	Yes	Limited	Limited
Adjacent walk/bike paths	No	Yes	Yes
Parks within 1 mile	Yes	Yes	Yes