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Evidence-Based, Best Practice Workplace Interventions to Reduce Overweight and Obesity Rates Among Employees in One Maine Organization: Identification of Strategic Models

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**Evidence-Based, Best Practice Workplace
Interventions to Reduce Overweight and
Obesity Rates among Employees in One
Maine Organization:
Identification of Strategic Models**

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Spring 2013

Table of Contents

Introduction	3
Problem Statement	3
Research Question	5
Methodology	6
Organizational Assessment	6
<i>Demographics</i>	7
<i>Health Culture & Leadership Support</i>	9
<i>Employee Interest Survey</i>	11
<i>Focus Groups</i>	13
<i>Heath Risk Appraisal</i>	14
<i>Health Claims Utilization</i>	17
Limitations: Organizational Assessment	20
Review of Existing Evidence	21
Limitations: Review of Existing Evidence	36
Recommendations for Company A Municipality	36
<i>Multi-dimensional</i>	37
<i>Employee Input</i>	37
<i>Health Screening</i>	38
<i>Spouse Inclusion</i>	38
<i>Behavioral Modification</i>	39
<i>Leadership Support</i>	41
<i>Physical Environment</i>	42
<i>Physical Activity & Nutrition Programs</i>	44
<i>Incentives</i>	44
Synthesis of Graduate Classes	46
APPENDIX 1: Focus Group Questions & Responses	47
APPENDIX 2: Medical Claims Data Request	50
APPENDIX 3: Literature Review	51
References	77

Introduction

Wellness programs have evolved over several decades and during this time there has been a great deal of research conducted to measure the efficacy of these programs. Companies of all sizes have implemented a wide range of programming to reduce modifiable risky behaviors, increase the productivity of their workforce, reduce injuries on the job and now more than ever, reduce the burden of escalating health care costs. The goals of this capstone is to: 1) explore overweight and obesity in the workplace and its impact on chronic disease, in one Maine organization, and 2) to identify innovative as well as best practice, evidence-based interventions that will reduce this risk. Research consists of a thorough organizational assessment and a broad investigation of the academic literature supporting workplace weight intervention strategies.

Problem Statement

Obesity, a highly modifiable risk factor, is the second leading cause of preventable death, second only to tobacco use, in the United States with one of the greatest impacts on disease and premature death. (JAMA, 2004) This health issue presents an enormous burden for employers in Maine and throughout the country in terms of rising healthcare costs, disability, absenteeism and lost productivity. Implementing evidence-based worksite health promotion strategies and policies to reduce this risk has shown to help control the rising cost of health care facing employers today. Multi-pronged, population-specific programs, theories, strategies and policies are necessary to help influence lasting positive behavior change, but it is much easier said than done. Unhealthy behaviors often take a lifetime to develop and are heavily influenced by the environment in which we live and work. If we are successful in impacting behavior change at the worksite through establishing targeted interventions that encourage and support employees to develop healthier lifestyles then it stands to reason that these healthy behaviors will transition into the employee's life outside of the workplace.

It's no surprise that obesity is a major risk factor for many chronic conditions such as heart disease and stroke, hypertension, diabetes, arthritis, and some cancers. Although obesity rates seem to be leveling off, one in three adults in the U.S. are considered obese. (CDC, 2009) By the year 2030, it is estimated that all U.S. states will be facing a significant increase in obesity rates with at least 44% of the population categorized as obese. If state obesity rates continue to rise as predicted, the incidence of chronic disease such as type 2 diabetes, heart disease, stroke and hypertension could increase ten times over the next decade and then double by 2030. (Levi et al., 2011) According to a 2009 study published in Health Affairs, from 1998 to 2006 the increase in spending for private payers was significant, ranging from \$284 for prescription drugs to \$443 for inpatient services. These increases equate to an eighty-two percent and ninety percent increase in costs when compared to individuals within a normal weight range. (Finkelstein et al., 2009) The study goes on to say that there are multiple interventions available, i.e. pharmaceutical, medical and surgical interventions, but all are rarely employed, making the costs associated with obesity a direct result of the medical conditions in which obesity plays a primary role. Employers are left with escalating health care costs due in large part to obesity rates that are unsustainable for future organizational prosperity.

According to a 2011 Bureau of Labor Statistics report, on average, employed Americans work 7.6 hours Sunday through Saturday with those that work Monday through Friday averaging 8 hours per day, representing approximately half of an individual's waking hours spent in the workplace. Herein lays a tremendous opportunity within the context of workplace health promotion. The elimination of barriers to physical activity during the workday, healthier food options at the worksite and developing an environment that encourages healthy behaviors are just a few ways to establish a foundation which promotes and supports a culture of good health

within the worksite. Without altering the workplace environment and establishing a health-focused organizational culture within that environment, workplace health promotion specialists will surely fail in their efforts to develop and nurture a healthier workforce. Employers across the country have implemented innovative wellness programs to address rising obesity rates and the resulting toll on employer costs. The health promotion literature in this area will reveal what other worksites are doing to drive their risk down and the challenges, both internally and externally, they have faced along the way.

The statistics are alarming and the need for intervention is undeniable. This is one of the primary reasons so many employers have invested in worksite wellness programs that target specific risky behaviors such as physical inactivity and poor nutritional status. We will take a closer look at overweight and obesity in the workplace, the specific impact on one Maine organization, incurred cost to the employer and, based on the literature, potential strategic interventions that can positively impact behavior change.

Research Question

With obesity rates on the rise both nationally and in the state of Maine, what are the most effective, best-practice, evidence-based obesity interventions that can be employed by one Maine organization to positively impact behavior change, reduce their obesity burden and result in cost savings to the employer?

One Maine organization, currently with a wellness programs in place, has voluntarily participated in the research project. The goal was to identify wellness program models for obesity reduction, driven in part by evidence-based research, to meet the specific needs of the organization, ultimately resulting in the long term stabilization of both direct and indirect health care costs for the employer.

Methodology

For purposes of this project the identity of the volunteer organization will remain confidential and will be referred to as “*Company A Municipality*” or “*C.A.M.*”. C.A.M.’s research consists of a thorough organizational assessment including 2012 employee interest survey results, 2013 aggregate focus group data, 2012 and 2013 aggregate health risk assessment and biometric data, and lastly, 2011 and 2012 aggregate health care utilization. All data are unidentifiable in terms of individual risk. The data has been collected and analyzed. Where there are multiple years of data, trends were examined to identify the risk of overweight and obesity on chronic disease development. In addition to the organizational assessment, a broad, but not exhaustive, literature review has been conducted to identify various strategies that employers have used to reduce overweight and obesity rates among workforces in the past thirty years. Included in the research is an investigation of best practice, evidence-based strategies adopted by employers of all sizes and varying demographics that exhibit promising impacts on overweight and obesity rates as well as create the largest impact on both direct and indirect costs to the employer. Multiple sources were used to collect the health promotion literature including PubMed and Medline as well as articles available through the National Wellness Institute (NWI), Health Enhancement Systems and the Wellness Council of America (WELCOA). The overall risk to the organization will be discussed, intervention strategies will be reviewed and specific recommendations will be made.

Organizational Assessment

C.A.M. strives to be an employer of choice in Maine. To be an employer of choice and able to recruit some of the best talent in the area, one of the strategies the organization uses is their generous benefits package that is offered to employees, spouses and dependents. C.A.M.

provides medical and dental insurance through Anthem Blue Cross Blue Shield, an employee assistance program (EAP) also through Anthem Blue Cross Blue Shield, short term and long term disability, flexible spending accounts, a pension plan, 401(a) Defined Contribution plan, and a variety of services that are included under Maine Municipal Employees Health Trust (MMEHT) which they are a member of. MMEHT's mission is to meet the needs of local government employees, retirees, dependents and employer groups by providing access to various cost-effective, quality employee benefit programs. MMEHT is home to Wellness Works, a health education and promotion program. MMEHT's Wellness Works offers wellness program services to all four hundred and fifty municipalities within the Trust. At this time, C.A.M. utilizes their lunch and learn programs to provide employees with educational opportunities that meet their needs and interests. Specific examples include: Diabetes 101, Financial Fitness, Know Your Numbers, and exercise and nutrition programs. In all, MMEHT's Wellness Works offers seventy-three different educational session topics to municipalities seeking educational programming. In the not too distant past, only employees covered under MMEHT were able to participate in any of the wellness program offerings at C.A.M.'s worksite. However, beginning in 2010, C.A.M. began to invite all employees, regardless of their health insurance coverage status to participate in all wellness program activities.

C.A.M. has five employee union contracts with Northern New England Health Benefit Trust (NNEHBT) which presents another layer of complexity as opposed to having all employees under one employee benefit umbrella. In order to implement changes or add programs and services, C.A.M. and the five different unions have to come together and negotiate. This process can take weeks and even months depending on the scope of programs/services/changes

being negotiated. Union employees are covered under Cigna Health Care for their medical coverage, but all other benefits are alike across both non-union and union employees.

Demographics

The total number of C.A.M. employees is approximately 399, but varies throughout the calendar year. There are 382 full-time employees and 17 part-time employees. Of the 399 employees, 71.4% or 285 employees belong to a union with 28.6% or 114 employees categorized as non-union employees. There are four locations; two are located in the greater Portland area and two in the Lakes Region. The age group reveals that C.A.M. has an aging population with 58% over the age of forty. The population is primarily male, 73% male and 27% female.

Certain departments within the municipality require around the clock coverage, seven days a week. For example, Corrections Officers work one of three shifts: 7:00am-3:00pm, 3:00pm-11:00pm or 11:00pm-7:00am. The Communications Center employees also work on shifts, typically ten hour shifts; 6:00am-4:00pm and 4:00pm-2:00am. Several challenges arise with this demographic. As previously mentioned, there are a large number of union employees which creates a completely different dynamic in terms of the types of benefits employees can be offered. For example, if C.A.M. wanted to initiate a “flex-time” policy whereby employees could use time during the day to engage in physical activity or another wellness related activity, C.A.M. would need to re-negotiate these benefits with all five unions. However, union contract negotiations are not ongoing; therefore C.A.M. would need to wait for the contract to be up for renewal. There are circumstances where amendments can be made, but it is often a lengthy process. Another challenge this population faces is with age. Over half of the employees are over forty years old. As we age, our metabolism slows, our energy levels dip and we are busy with

our professional and personal lives to the extent where it can seem impossible to find the time to incorporate more physical activity or make healthy food choices. Lack of physical activity and poor nutritional choices can often lead to incremental weight gain over time, causing a whole host of problems in terms of declining health status. If that's not enough of a challenge, we then face problems associated with shift work. There is sufficient evidence that health screening campaigns and intervention strategies applied to shift workers is very much needed to prevent diabetes as well as a many other chronic conditions. (The PLoS Medicine Editors, 2011) The literature suggests that the cause of elevated chronic disease in this population is in large part due to the disruption of circadian rhythms that regulate both the cardiovascular and metabolic systems. In combination with poor diet, lack of exercise and poor quality and quantity of sleep, there is a significant need for targeted interventions among shift workers. (The PLoS Medicine Editors, 2011)

Health Culture and Leadership Support

Senior level support is the single most important aspect of a successful wellness program and is instrumental in getting the program off the ground. (Taylor & Bithony, 2012) Having support from the senior management team or c-suite is the foundation for achieving a culture of health within the worksite. Leaders of the organization must share with employees the company's vision of wellness, the purpose behind their intentions and offer the resources to employees seeking to participate. They need to serve as role models for the program, by participating in activities, sharing their goals, challenges and success stories. The leaders are charged with aligning "touch points", making sure that all perceived barriers have been eliminated and making sure employees feel comfortable participating in the program at work, on work time. And lastly, leaders need to monitor and celebrate success of employees'

accomplishments by recognizing employees for their support and commitment to living a healthy lifestyle. (Taylor, M., Bithoney, W., 2012) The Wellness Council of America (WELCOA) has, for years, described the Seven C's of Worksite Wellness as the seven fundamental requirements for developing a successful wellness program with the first and most important rule of thumb being the need to capture senior level support.

(<http://www.welcoa.org/wellworkplace/sevens/index.php>) Without the support of the management team, well-intentioned wellness professionals will not find success in their efforts to create and foster a healthier work environment. Instead, they will be faced with an uphill battle.

C.A.M.'s leadership team consists of directors, managers, supervisors and elected officials. The leadership team is kept apprised of the various wellness strategies being implemented as well as updated on employee feedback, aggregate data on health status and aggregate health claims utilization. Keeping leadership abreast of all aspects of the wellness program, deliverables and expectations, will influence leadership's position on the value of wellness to the organization. In addition, it is necessary to educate C.A.M.'s leadership team about the costs facing the organization, both directly and indirectly. Direct costs can be defined as health care costs, worker's compensation costs, short term and long term disability costs. The indirect costs, which are oftentimes discounted and even forgotten about, are costs associated with absenteeism, presenteeism and productivity. Absenteeism is relatively simple to measure but presenteeism and productivity present a more complicated dynamic in terms of measuring outcomes. Dee Edington, a leading expert in the field of health promotion, would argue that the cost of lost productivity far exceeds the cost of medical care. It is therefore a goal of a well implemented strategic wellness plan to increase employee productivity. By helping employees

improve their health, in turn they will be less sick, have higher morale because of how good they feel, resulting in more productivity during their work hours. The majority of C.A.M.'s leadership team is embracing wellness as a long term strategy. As the program has evolved, so have the opinions of leadership around the need for targeted interventions specifically regarding weight management. Where C.A.M. struggles and they're not alone, is getting leaders to "walk the walk". It takes more than words of support to show employees that wellness is a way of life. It's the actions of leadership that set the tone for how wellness is perceived. Participation in on-site wellness related activities by leadership has been low and is in need of widespread improvement. It will be instrumental in changing the culture of the worksite and the attitudes of their subordinates around the benefits of worksite wellness and more specifically the importance of reducing the weight burden in the workplace.

Employee Interest Survey

In September 2012, C.A.M. completed an employee interest survey. The survey was created to assist C.A.M.'s Wellness Committee in determining what and where to focus their programs and activities. The Wellness Committee is comprised of fifteen employees from a variety of disciplines in order to ensure all voices are heard and all departments are represented. The survey was open to all employees and made available through an external website. Employees were given two weeks to complete the survey before the results were tallied. C.A.M. promoted a \$50 Hannaford gift card random drawing eligible to all those that completed the survey. Seventy-seven employees took the survey and approximately two-thirds opted to include their names to be entered into the gift card drawing. Of the seventy-seven surveys received, 73% of the employees work in the greater Portland area and 27% in the Lakes Region area. Females comprised 62% of the responses and males, 38%. Aligning with the increasing age of the

population, 59% of the responses were from employees over the age of forty. Employees were asked to share information on their preferences for communication, health habits and motivations to be healthier or maintain a healthy lifestyle. Employees responded that they prefer email as the best means for communication followed by flyers and posters in their work area. The health topics that received the most responses included “Weight Management: 57%”, “Nutritious Cooking: 45%”, “Stress Reduction Tips: 43%”, “Starting to Exercise: 38%” and lastly “Women’s Health: 33%”. Of all the survey respondents, 50% currently participate in C.A.M.’s wellness program. The most common reason for not participating was lack of time and lack of coordination with evening and overnight shifts. When asked about motivating factors that would encourage employees to participate in C.A.M.’s wellness program, incentives were the number one motivator, followed by inclusion of family members. Employees were candid about being able to participate in activities while on the clock due to their hectic schedules and commitments outside of the workplace. The types of incentives employees are interested in receiving were fitness club memberships, money, gift cards and recognition.

Among the various areas evaluated in the interest survey, C.A.M. wanted to determine employees’ readiness to change. Using the Transtheoretical Model, Stages of Change (TTM SOC), C.A.M. asked specific questions about readiness to reveal whether employees are ready to make lifestyle improvements. TTM SOC depicts five stages that individuals move through when changing certain behaviors. The journey is oftentimes not sequential, but allows C.A.M. to understand the population they wish to target with their interventions. The Transtheoretical Model (TTM) describes behavior change in terms of moving from an unhealthy behavior to a healthy one. (Tuah et al., 2012) It was first found to be affective in tobacco cessation programs but has since been studied in the area of weight management. The five stages of the TTM SOC

are *pre-contemplation, contemplation, preparation, action and maintenance*. The interest survey revealed that 57% of employees are in the *preparation* stage. “Preparation is a stage that combines intention and behavioral criteria. Individuals in this stage are intending to take action in the next month and have unsuccessfully taken action in the past year.”

(<http://www.uri.edu/research/cprc/TTM/StagesOfChange.htm>). There are 26% in the “maintenance” stage and 17% in the contemplation stage. No one responded that they are in the “pre-contemplation” stage. The benefit of determining at what stage employees are along the continuum helps C.A.M. decide what areas of the population are best suited for a targeted intervention.

Focus Groups

Focus groups were conducted in three departments of C.A.M. during the months of January and February, 2013. The attendees were a mixture of employees from various disciplines. It was the goal of the facilitator to have a variety of employees present and participating so that all needs and interests were represented. The questions and responses are outlined in Appendix 1. Key findings from the focus groups revealed that most employees would like flexible time during the day to incorporate physical activity outside of their regularly scheduled lunch and break times. All locations function differently and have different expectations from their supervisors, often making it difficult to encourage a “one size fits all” approach. There was interest from the different groups to focus on nutrition and have a certified dietitian spend time with the employees teaching them shopping and cooking techniques. It was clear from the responses that there are multiple influences that affect the nutritional choices among the groups including stress, availability of healthy food choices and difficulty creating new habits. As the saying goes, old habits are hard to break, and certainly rings true with many

employees. Other groups stated they would like exercise equipment available on-site to use during their break times as well as offer exercise classes such as Yoga, before, during or after the workday. Employee recognition for participating in wellness activities was a common interest among employees. The need to hear other's success stories and identify employees that are making healthy changes was shared by most participants. Celebrating employee success may help employees not only maintain the healthy lifestyles they lead, but could also influence others to make positive changes who may not have been ready to do so in the past. Leadership support of the wellness initiative in certain departments seemed to be an ongoing issue and there was a great deal of interest in providing information on stress management techniques.

Health Risk Appraisal

C.A.M. conducts an annual health risk appraisal (HRA) and biometric screening campaign at each one of their four worksites. In 2013, the campaign was held in February and was offered at different times during the day that were convenient for each location. A group of healthcare professionals from the local medical center were stationed at each location for several hours. Employees scheduled twenty minute appointments to have their blood pressure taken, height and weight recorded to determine their body mass index (BMI), total cholesterol, HDL and LDL cholesterol, triglycerides and glucose levels were given to the employee. Once each employee had their results in hand they were asked to take an online health risk appraisal. The HRA records their biometric screening results, asks questions regarding diet, physical activity, tobacco use, alcohol use, stress, mood, family history of disease and readiness to change unhealthy behaviors. Employees are able to view their completed assessment, called a Personal Wellness Profile, directly following their completed input. Once all employees have completed the process, an aggregate report of all participants' health risks is generated. The results for

C.A.M.'s HRA and biometric screening campaign are provided in this section and are compared to the results of the same screening campaign from the prior year.

The percentage of participation in the health risk appraisal and biometric screening campaign did not change from 2011 to 2012. Approximately 12.5% of the total employee population participated in the screening process both years. This is a low percentage compared to worksites across all industries and is likely due to the type of incentive provided and the voluntary nature of the program. One of the questions on the HRA asks the employee what their perception is of C.A.M.'s interest in a healthier workplace. This is an important question in that it measures the extent to which the employee believes there is a culture of health. Thirty-one percent of participants feel there is an "excellent/high interest" as compared to 2011 when just twenty-one percent reported the same level of support. Forty-five percent feel there is a "good" amount of interest and the remaining percentage, twenty-four percent feels there is "fair" to "little interest" in creating a healthier workplace. Although there is improvement in the employee's perceptions around C.A.M.'s commitment and support of a healthier culture, there is still much more that can be done to reinforce and strengthen these beliefs among employees.

The health priority recommendations did not change between 2011 and 2012. Weight management came in at number one followed by nutrition, osteoporosis, physical activity, sleep and blood pressure reduction. Excess body weight is one of the most common health conditions linked to chronic disease and high healthcare costs. In 2011, 67% of employees were outside the recommended weight range with a body mass index of twenty-five or greater. In 2012, 68% were outside the recommended weight range. It's not a surprise then that nutritional changes are a priority for this group with 83% showing a need for nutritional changes in 2011 and 73% in 2012. Although there is improvement when comparing the data, this remains a significant

population health risk. Good nutrition is vital for energy, good health, and prevention of disease. Poor eating habits lead to obesity, diabetes, high blood pressure, cancer, coronary heart disease and stroke. There are multiple strategies that can be employed to improve nutritional choices in the worksite and, in turn influence choices outside the workplace. Specific strategies will be discussed in the literature review and recommendations section.

Osteoporosis is a significant risk factor for this population with 71% having two or more risk factors for this condition. Osteoporosis is a major cause of fractures and high healthcare costs. Healthy eating, not smoking and increasing physical activity can greatly reduce one's risk for developing osteoporosis. In 2011, 49% of employees were not getting the recommended level of physical activity, 150 minutes per week at minimum. In 2012, that percentage improved to 41%, but is still a major risk factor for this population largely due to the sedentary nature of the work being done.

Educating employees on the need for increasing hours of sleep each day is also a priority for this population. It's probably safe to say that most people do not get the recommended amount of sleep, and is true for this population; 61% do not get the recommended amount of sleep (seven to eight hours/night). A lack of adequate sleep increases a person's risk for weight gain, stress, depression and high blood pressure. High blood pressure among the participants increased from 2011 to 2012, going from 11% to 22%. High blood pressure is categorized as being 140/90 or greater. Reducing blood pressure is proven to be an effective way of reducing one's risk for cardiovascular disease and increases longevity.

The overall screening process also looks at risk factors such as coronary risk, cholesterol, cancer risk, and stress, all of which overweight and obesity plays a role. In 2012, coronary risk decreased from 46% in 2011 to 39% in 2012. The top three coronary risk factors for this

population are obesity, little to no physical activity and metabolic syndrome which is a combination of medical disorders that when occurring together increase one's risk for developing cardiovascular disease and diabetes. There were significant improvements in the cholesterol measurements among the screened population for 2012. In 2011, 43% of employees screened had cholesterol numbers above the recommended level. In 2012, that number decreased to 5%. Cancer risk also improved dropping 5% from 2011 to 2012. According to the data, employees are receiving the appropriate cancer screenings recommended for their age and gender including mammograms, pap tests, prostate checks and colonoscopies. Another high risk factor for this population is stress. The results are not well represented by the 2011 and 2012 screening results due to the low number of employees screened compared to the rest of the population. Corrections Officers, Patrol Officers and Detectives are just a few of the high stress and at times dangerous jobs among C.A.M.'s workforce. And the lion's share of employees in these positions did not participate in the health screening and therefore the results cannot be extrapolated across the entire population. The data in the screening did reveal that the top three stress related risk factors for this group were high levels of stress at home, high levels of stress at work, and having two or more major life events causing stress. High levels of stress and poor coping ability are significant causes of high healthcare claims, impaired productivity and causing low job satisfaction. They also contribute to weight gain, depression, anxiety and other chronic health conditions.

Health Claims Utilization

C.A.M. requests specific data from Maine Municipal Employee Health Trust (MMEHT) regarding health care utilization following the end of each health benefit plan year. The aggregate data is provided by Anthem Blue Cross Blue Shield. Unfortunately, NNEHBT is not willing to provide health care utilization data for the union employees covered under CIGNA

Health Care. Therefore, the information in this section is strictly utilization by non-union employees. The template used to request utilization data from Anthem is located in APPENDIX 2.

Actual information received varies from the information requested in the “Medical Claims Data Request Template” as there are limitations of the insurer in terms of their reporting capabilities. Insurers are hesitant to provide too much information for fear that member protected health information (PHI) may be revealed to the employer. The insurer has to be certain that member information is kept confidential at all times.

The aggregate data were received by C.A.M. at the beginning of March 2013 for plan year 2012. There were 633 members on the health plan, up 69 members from 2011. Members include: the employee as the subscriber, spouse/domestic partner and dependent(s) on the plan. The data does not include costs from the fourth quarter due to unavailability of the data at the time of review. As of the end of the third quarter, September 30, 2012, C.A.M.’s total employer costs were \$2,327,733, with prescription drug costs of \$446,381 and medical costs \$1,895,756. Medical claims by setting revealed that the largest increase in costs were a result of inpatient services, up almost one million dollars compared to the prior year. Inpatient services represented 32.1% of total plan costs for 2012. It is possible that the one million dollar increase in inpatient services could be one large claim and hopefully an anomaly as oftentimes the high cost claimants are. All other categories, Outpatient, Professional and Prescriptions Drug costs were all lower than the prior year, keeping in mind that fourth quarter data are not included in the aggregate reporting. For Outpatient costs, the top six categories showing an increase from the prior year were surgeries, home health, radiology, lab/pathology, emergency department use and PT/OT/ST (physical therapy, occupational therapy and speech therapy). The largest increases in costs for

Professional Services from the prior year were categorized as office visits, outpatient surgeries, behavioral health, durable medical equipment, emergency department, ambulance, inpatient visits and cardiovascular visits. There was little change to the top five therapeutic drug classes for 2011 compared to 2012. In 2011, the top five categories were central nervous system drugs, endocrine, cardiovascular agents, neuromuscular drugs and analgesics and anesthetics respectively, representing 71% of all prescriptions filled. In 2012, cardiovascular agents, central nervous system drugs, endocrine and metabolic, respiratory agents and analgesics and anesthetics were the top five respectively, representing 76% of all prescriptions filled. The largest changes were seen in respiratory agents, up 5%, cardiovascular agents up 8.2% and neuromuscular drugs down 5.4% resulting in neuromuscular drugs dropping off the top five.

Anthem also provides a break down of Major Practice Categories (MPC) by cost. Members are linked to certain diagnostic clinical categories that are determined when a patient presents with a medical condition, is diagnosed, and then treated for that condition. The top ten Major Practice Categories by cost for C.A.M include “not mapped to a MPC” (396 members) meaning a member is just starting an episode of treatment and does not meet the time criteria for the ETG (episode treatment groupers), and therefore there is not enough information at this point to place the member into a MPC. However, members will eventually fall into one of the Major Practice Category buckets once they have met the time criteria. The remaining nine categories include orthopedics and rheumatology (255), cardiology (153), endocrinology (187), malignant neoplasm (18), behavioral health (194), gastroenterology (118), preventive and administrative (567), pulmonology (135) and benign neoplasm (80). The MPC classification is a helpful tool in determining specific conditions that can be linked to overweight and obesity and targeted through appropriate interventions. The specific conditions classified under those areas that can be

ties to excess weight are *Endocrinology* (includes, but is not limited to Adrenal Gland Dysfunction, Diabetes, Diseases of the Thyroid Gland, Gout, Hyperlipidemia, Nutritional Deficiency, Obesity, Thyroid Dysfunction), *Cardiology* (includes, but is not limited to Aneurysms, Atherosclerosis, Cardiac Congenital Disorder, Cardiac Trauma, Congestive Heart Failure, Coronary Artery Disease, Heart Transplant, Hypertension), *Gastroenterology* (includes, but is not limited to Appendicitis, Bowel Obstruction, Congenital Anomalies of the Intestines and Abdomen, Diverticulitis, Gastric Ulcer, Gastritis and/or Duodenitis, Hemorrhoids, Hernias, IBS), and *Orthopedics and Rheumatology* (includes, but is not limited to Arthritis, Bursitis and Tendinitis, Fractures and Dislocations, Lupus, Major Joint Inflammation other than Arthritis, Major Orthopedic Trauma other than Fracture, Minor Orthopedic Trauma, Osteoporosis). Some forms of cancer have also been linked to overweight and obesity. With the right interventions, C.A.M. can greatly reduce these statistics and stabilize health care expenditures over time.

Limitations: Organizational Assessment

Several limitations exist among the data collected. First, C.A.M.'s health care utilization data represents only the insured employee and family population on the Anthem Blue Cross Blue Shield health plan. It does not identify health risks of employees that opt-out of health insurance coverage, are insured under the CIGNA health plan, are insured by their spouse or domestic partner or have a part-time or per diem status and are ineligible for health insurance benefits. Second, the health risk assessment and biometric data collection is a voluntary process, whereby the employee can choose not to participate in the program and therefore their risk factors remain unidentified and do not contribute to the overall risk to the organization. With only 12.5% of the total population participating, 87.5% are unaccounted for. It is almost certain that the overweight and obesity risk, as well as the risk of relative chronic disease is much greater than what is

evident from the data and should be a significant concern for the organization. It would be in the best interest of the organization to implement an enticing incentive strategy such as a health insurance premium discount for participating in this process in the coming years. In addition, the data are not longitudinal; two-thirds of the same employees were screened both years. One-third of the participants were new to the screening process and in turn altering the true comparison of the data. Third, the data reported in the health risk assessment is strictly self-reported, leaving the opportunity for inaccurate information to be keyed by the employee and as a result the data could be skewed in either direction. There is no way to tell whether the information is accurately being reported and could provide a false sense of the overall risk in terms of both health risk and direct and indirect costs to the organization.

Review of Existing Evidence

To identify the most appropriate weight management interventions strategies for C.A.M.'s worksite a thorough literature review was conducted to gain understanding of the work being done in this area. Multiple sources were used to collect the literature referred to in this section including PubMed and Medline as well as literature available through the National Wellness Institute (NWI), Health Enhancement Systems (HES) and the Wellness Council of America (WELCOA). To meet the criteria for inclusion, the literature had to be written within the last thirty years and published in the United States or Europe. The content of the literature needed to meet one of three requirements. The literature had to: 1) describe successful worksite intervention(s) to reduce overweight and obesity, 2) discuss overweight and obesity related costs, or 3) show potential return on investment (ROI) for implementing overweight and obesity interventions in the worksite. Twenty-three articles met the inclusion criteria. Five articles focused on the cost of overweight and obesity in the workplace, seventeen articles were based on

worksite interventions including physical activity, improving nutritional choices, behavioral interventions, applying appropriate incentives, and altering the built the environment through both policy and cultural interventions. The final article is a systematic review of the financial return on investment (ROI) for worksite interventions aimed at improving nutrition and/or increasing physical activity.

Of the five articles discussing the cost of overweight and obesity, four of the articles refer to studies focusing on medical spending for overweight and obesity and one article depicts an interview given by a nationally recognized expert in worksite health promotion. In the interview article, Dr. Steve Aldana discusses the prevalence and cost associated with unhealthy behaviors, specifically little to no physical activity and poor nutrition. He emphasizes how critical it is that worksites develop an intensive and comprehensive worksite wellness strategy. (Aldana, 2007) He explains that over the last several years, experts have changed the way we measure recommended physical activity, increasing the recommendations to include thirty minutes of physical activity every day. This increase affects our society with 78-80% of the entire U.S. population not getting enough daily exercise. (Aldana, 2007) Coupled with poor nutrition, the numbers become even more concerning. He points out that 35-40% of total health care costs are attributable to the obesity epidemic. (Aldana, 2007) And that sedentary living alone costs the nation \$150 billion, 15% of all health care costs in the United States. (Aldana, 2007) A study published in 2009, reviewing a collection of data from the 1998 and 2006 Medical Expenditure Panel Surveys (MEPS), looked at over 32,000 adults during the eight year time period and provides estimates of the cost of obesity across all U.S. payers including Medicare, Medicaid and private insurers. (Finkelstein et al, 2009) The article speaks to the importance of multiple strategies to address this epidemic, including both policy and environmental interventions. The

findings of the study reveal that obese people have a per capita medical spending that is 42% higher than spending for normal weight adults. For private payers alone the increase in spending is even higher at 58%. (Finkelstein et al, 2009) One of the papers reviewed highlighted the enormous costs and risks associated with increasing weight. Obesity costs employers more than \$12 billion each year in healthcare utilization, reduced productivity, and higher absenteeism. (Health Enhancement Systems, 2011) Long term employer commitment to providing weight loss and weight management strategies is critical to fight this epidemic. Sixty-six percent of the population is overweight or obese, continuing to drive health care expense more than twice the rate of inflation. (Health Enhancement Systems, 2011) Inactivity, a primary contributor to overweight and obesity, costs \$670-\$1125 per person annually. If the more than 88 million inactive American adults were to increase regular, moderate physical activity, annual healthcare costs could be reduced by as much as \$76.6 billion. (Health Enhancement Systems, 2011) Having reviewed these articles and others, it is clear that interventions to reduce overweight and obesity are incredibly important for not only employers, but to our nation as a whole. Given the amount of time Americans spend working, the sedentary nature of our worksites and rising healthcare costs, comprehensive workplace strategies are necessary to impact this growing problem.

Of the seventeen articles reviewed that focus on intervention strategies, five of the articles provided an assortment of worksite recommendations, nine were studies conducted at various worksites and two articles were systematic reviews discussing the efficacy of worksite interventions in the area of promoting healthy weight. All emphasize the importance of choosing targeted interventions that are tailored to the population. (Hunnicut, 2007) It is important to have a coordinated, strategic prevention approach that promotes healthy behaviors, eliminates

disparities, and focuses on early detection and diagnosis of disease. (CDC, 2009) Dr. David Hunnicut outlines several important questions to consider when worksites want to design a targeted intervention. First, be sure to collect data on the population in order to develop an appropriate intervention strategy, identify incentives for individuals achieving the standards set forth, know the specific timeframe of the intervention and communicate the program effectively. (Hunnicut, 2007) He also emphasizes the importance of offering programs to all shifts and locations and to seek legal counsel, if needed, to determine necessary waivers for individuals that cannot meet the intervention standards. (Hunnicut, 2007)

One article focused specifically on ways to improve nutrition among worksite employees, promising immediate gains such as reduced absenteeism, higher productivity and increased employee retention in addition to long term reductions in health care costs. (Health Enhancement Systems, 2011) The article describes an uncomplicated, produce-based workplace nutrition program involving a simple messaging campaign around the importance of fruits and vegetables. (Health Enhancement Systems, 2011) The article suggests eight ways to implement this intervention: 1) provide workers with tips such as serving sizes and healthy produce recipes; 2) keep healthy snacks like apples and bananas available for employees in cafeterias and vending machines; 3) encourage employees to focus on the color of the produce rather than counting calories; 4) prominently post a *produce first* message; 5) encourage social support from co-workers, especially managers and supervisors; 6) promote the emotional and psychological benefits of a simple nutrition approach; 7) emphasize the relationship between nutrition and an active lifestyle; and 8) reach out to all staff, at all levels, to create a culture of health. (Health Enhancement Systems, 2011) Achieving a culture of health is no easy feat. Culture change is a long term process that is vital to the workplace's profitability and sustainability. (Allen, 2008) It

takes employees at all levels of the organization to be committed to a healthier workplace in order for a healthy culture to be established and sustained. Cultures are complex systems and work at both the conscious and unconscious levels, from procedures such as no smoking policies to subtle influences such as peer attitudes about exercising during lunch breaks. (Allen, 2008)

Allen describes the word culture as the “social forces that shape behavior and beliefs through mechanisms such as norms, support, modeling, training, rewards and communication. Strong cultures offer reliable, consistent guidance about attitudes and behavior.” (Allen, 2008)

Throughout the literature, there was a strong emphasis on the importance of building a culture of health. One large study that looked at 350,000 hospital employees and their dependents from 200 hospitals offered a framework for best-practices around health and productivity management. “A **best-practice** is a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark.” (Wikipedia, 2013) The paper states that in order to successfully influence the risk level of their employees, all hospitals and health systems alike must adopt a culture of health. (Taylor & Bithony, 2012) To achieve a culture of health, it must start at the highest level within the organization and be part of the overall business strategy. The article states that it is the most important aspect of a successful wellness program and is outlined as the one of the ten best-practices in health promotion. (Taylor & Bithony, 2012) The remaining nine best practice strategies include: 1) having an interdisciplinary team focus; 2) initial and ongoing analysis of the health risks of the employee population; 3) senior management involvement and shared responsibility among the team; 4) staff members must be dedicated to prevention, health promotion and wellness; 5) emphasis on improving quality of life over cost cutting measures; 6) have measurable goals and objectives to evaluate return on investment; 7) develop and implement a continuous and effective communication strategy; 8)

constantly improve through receiving feedback from employees; and lastly 9) review, revise and align policies and procedures to support a healthy workplace. (Taylor & Bithony, 2012) These best-practice strategies are not only appropriate for hospitals and health systems, but are a universal, best-practice guide to develop and sustain a successful health and productivity management model and could have the potential to be wholly adopted by C.A.M.

Recently released by the CDC, The CDC Worksite Health ScoreCard (HSC) is a new tool to help employers evaluate whether or not they have successfully implemented an evidence-based, best practice health promotion program in their worksite. (CDC, 2012) Strategies include interventions to prevent heart disease, stroke, and related conditions such as hypertension, diabetes, and obesity. The CDC's recommended evidence-based program approach is one that involves multiple components: risk reduction programs, environmental supports for healthy behaviors and is fully integrated with other wellness activities. (CDC, 2012) The CDC Worksite Health ScoreCard is a series of 100 questions pertaining to many of the key evidence-based and best practice strategies that are vital to worksite health promotion efforts. These interventions are designed to address the leading health conditions driving health care and productivity costs, including health counseling services, environmental supports, policies, health insurance benefits, and other worksite programs proven to be effective in preventing heart disease, stroke, and a myriad of other health conditions. (CDC, 2012) Employers can use this tool to assess their programs and identify potential gaps to prioritize additional strategies.

One article speaks about the ineffectiveness of financial incentives in creating healthy behaviors, rather, rewarding through praise and positive attention as an effective way to build internal motivation for healthy behaviors. (Health Enhancement Systems, 2012) Results are divided in this area of research. How effective are cash awards, financial incentives and

insurance premium differentials in gaining support and participation in a workplace wellness program? This paper takes the position that cash rewards may get employees enrolled initially, but they will unlikely result in lasting behavior change and may actually reduce motivation. I would agree that motivation needs to come from within, but may need to be coaxed initially for employees to realize the benefits of healthier lifestyle choices. This paper outlines the top twenty ways to build intrinsic motivation to establish healthy behaviors. Strategies include inviting employee input through surveys, interviews and focus groups, increase the fun factor in various programs, include a team element in activities, provide multiple program choices for employees to participate in and offer programs more than once per year. Also, recognizing employees for their successes, allowing flexible scheduling for employees to incorporate more physical activity and using small prizes to acknowledge accomplishments. (Health Enhancement Systems, 2012)

This is not an exhaustive list, nor is it specifically related to overweight and obesity, but it does provide translatable strategies for all worksites that can be applied to overweight and obesity interventions. Another study conducted involving three thousand, seven hundred and thirty-seven individuals employed between 2007 and 2009 also assesses the effectiveness of incentives in stimulating individuals to make healthier choices. The paper looked at the “*Reaping Rewards Program*” (Merrill et al, 2011) which was developed after looking at several successful wellness program models. The Reaping Rewards program included monetary incentives for several activities such as attending physical exams, educational sessions on nutrition, physical activity program participation, as well as other programs that promote healthy lifestyles. (Merrill et al, 2011) Employees could potentially earn up \$150 annually. The results were impressive with the most significant improvements seen among obese employees such as improvements in fruit and

vegetable intake, mental health, biometric screening results, lower BMI and a better ability to cope with stressful situations. (Merrill et al, 2011)

There were eleven worksite studies reviewed, both randomized control trials (RCT's) and case studies that met the inclusion criteria. Together, they offer a vast assembly of interventions and recommendations to reduce overweight and obesity in the workplace. Some of the studies focused on changing the built environment within the worksite with one study whose purpose was to describe the development, reliability and validity of an assessment tool called EAT which measures the impact of workplace interventions that emphasize environmental strategies or a combination of environmental and individual strategies. (DeJoy et al, 2008) Other studies focused on the effectiveness of incentives to drive behavior change as well as one study describing additional best-practice strategies around health and productivity management. One study found that including spouses in the wellness program was an effective way to motivate employees as well as reduce health care costs. Another study focused on the challenges of initiating worksite health promotion strategies from both the employer and the employee's perspective. I will also discuss two large meta-analyses, one focusing on behavioral interventions and another focusing on a combination of interventions such as behavioral skill development, education, screenings, weight loss programs, structured and unstructured programming, environmental and policy changes.

The studies that involve changing the built environment provide useful recommendations toward strategies for impacting the overweight and obesity epidemic by increasing opportunities for physical activity and supporting better nutritional choices. The entire premise of changing the worksite environment is to reduce/eliminate perceived barriers to better food choices and physical activity in the workplace. (Gates et al, 2006) Targeting the environment is an important

first step, and in one study, adopted by four different manufacturing companies located in close proximity to one another. Together, they implemented five interventions using three key elements from the Diffusion of Innovations Theory: 1) innovation, 2) communication channels, and 3) a social system. The five interventions included: 1) designing measured walking paths for employees that were well lit for evening shift workers; 2) they changed the food options in vending machines and at staff meetings and posted nutritional information for employees to see; 3) they put up signs in the break rooms and cafeteria as well as in heavily trafficked areas. The signs were colorful, humorous, frequently changed and provided important information on nutrition and physical activity; 4) they implemented games, puzzles and interactive strategies to educate employees about nutrition; and 5) they initiated advisory groups consisting of employee volunteers who plan and implement the intervention strategies. (Gates et al, 2006)

The importance of a multi-pronged intervention approach to reduce overweight and obesity is a common theme among the studies reviewed and show the need for multiple, simultaneous interventions. The National Heart, Lung, and Blood Institute (NHLBI) developed the Environmental Assessment Tool (EAT) which assesses the worksite in terms of its support for obesity prevention efforts. (DeJoy et al, 2008) The preliminary findings of the effectiveness of EAT show that it reliably measures the physical and social environment, specifically around physical activity, food choices and weight management as well as organizational characteristics that support health promotion. (DeJoy et al, 2008) Unfortunately, the tool is not uniform to all worksites and therefore would need to be customized to the specific work environment. Another limitation is that the person(s) responsible for implementing EAT must have specialized training which can be cost prohibitive for worksites with little funding. (DeJoy et al, 2008) The study did find, in general, employees who worked for organizations that promote healthy eating, physical

activity and overall support for healthy behaviors have lower health care costs including indirect costs such as reduced absenteeism and increased productivity. (DeJoy et al, 2008)

One study's findings reinforce the need for individual, environmental and organizational strategies to reduce the burden of weight in the workplace. The study was conducted at nine small and medium-sized worksites and tested a new evaluation method called Swift Worksite Assessment and Translation (SWAT). Site visits took place over two sequential half-days at each of the nine worksites. (Hersey et. al., 2008) Through this assessment tool, the team of interviewers identified worksite health promotion strategies that were innovative and feasible to incorporate into a variety of settings. (Hersey et al, 2008) These strategies included peer coaching, health screenings, employee follow up using Motivational Interviewing techniques, free access to fitness facilities and provided various incentives for participation. The success of these strategies was tested through longitudinal samples of program participants over time. (Hersey et al, 2008) One of the main limitations to this study was the amount of self-reported data collected regarding height, weight and weight loss. When relying on self-reported data, there is always a margin for error. Unfortunately, the size of the margin is unknown. Another study found that success in lowering body mass index was due in large part to a dose-response relationship, with positive effects proportional to the extent of participation. (Lemon et al, 2008)

Six hospitals in central Massachusetts participated in a two-year intervention study to prevent weight gain through strategies targeted at the organization level, the interpersonal/environment level and employee level. (Lemon et. al., 2010) At the organizational level, interventions were targeted at leadership, culture and the level of support in the workplace in terms of weight management and other healthy behaviors. At the interpersonal/environmental level, interventions were focused on co-worker relationships and aimed to promote a supportive

environment around physical activity and healthy eating. (Lemon et. al., 2010) There were successes among the random sample of eight hundred and six employees, but the study points out that behavior change takes a long time to come about and the length of this study was not long enough to show the true potential of the intervention. (Lemon et. al., 2010) However, the interventions tested in this study show promise for reducing overweight and obesity in the workplace when all areas of workplace influences are accounted for and involved in the intervention.

A case study, involving eight employers and one health care advocacy group explored promising practices for population-based obesity management programs. The primary themes exhibited by all eight employers included dedicated program management and staffing, senior management support, employee screenings, diverse wellness committees, program design and evaluation, nutrition programs, physical activity programs, behavioral health programs, a clear communication strategy and a variety of incentives. (Romney, Thomson & Cash, 2011) Among the primary themes, there were three strategies that showed the most impressive results. The first was a very simple, twelve month team challenge that focused on walking and nutrition. Twenty-eight employees lost over four hundred pounds during the one year program. (Romney, Thomson & Cash, 2011) The second approach found success through implementing a behavior change model using game theory to establish healthy behaviors. This particular game theory encourages employees to use exercise and nutrition as a daily mental “game” in order to overcome any internal or external barriers that would normally deter them from staying on track to reach their goal. (Romney, Thomson & Cash, 2011) Analysis of the pilot is still underway, but has showed promising results thus far. The third initiative involves implementing a value-based approach to health and wellness. Those employers that participated in this initiative

prioritized their health goals based on the results of a baseline assessment conducted in 2008. The assessment revealed that weight management was the highest priority. The employers adopted six intervention strategies: 1) support for employee health through policy and environmental changes; 2) assembly of a health management team; 3) effectively engaging employees; 4) promoting value-based care through insurance design; 5) increasing vendor and provider value; and 6) utilizing actionable data. (Romney, Thomson & Cash, 2011) The study is still ongoing, but will be measured in a variety of ways including participation rates, change in biometric results and change in aggregate risk status. (Romney, Thomson & Cash, 2011) This study reinforces use of best-practice strategies while casting light on some more innovative programs that have shown initial success.

A 2012 report in HERO, the Health Enhancement Resource Organization, found that including spouses and domestic partners helped to influence healthy behaviors and participation in weight management programs at the worksite while lowering employer health care costs. (Tobenkin, 2013) HERO conducted a survey of seven hundred and eighty-eight employers and found that the average medical cost for spouses is about 30% higher than the covered employees. (Tobenkin, 2013) Employers are often cautious when beginning wellness programs and therefore only include employees. In time though, employers realize that healthcare costs are heavily driven by family members and their unhealthy behaviors greatly influence those of the employee. (Tobenkin, 2013) LL Bean's wellness program is used as an example, where employees receive health insurance premium discounts only when both the employee and the spouse participate in the programming. They offer several physical activity and nutrition programs as well as tobacco cessation programs. Employees expressed how difficult it was for them to live a healthy lifestyle when their spouse or partner did not. They have experienced impressive results: 22% fewer

individuals with high cholesterol, 18% reduction in high glucose levels and a 42% reduction in smoking rates. (Tobenkin, 2013)

One randomized control trial (RCT) involved three hundred and forty-one employees from eight different manufacturing companies whose outcome depicted the challenges that employers need to be conscious of when implementing health and wellness interventions. Employee perceptions about the motive behind health promotion programs can be a barrier to the success of the program. In this study, focus groups were formed to help decrease the employee's negative perceptions around paternalism or "big brother" misconceptions. (Gates & Brehm, 2010) Soliciting input from employees will help to reduce these negative feelings and was successful in doing so among the study participants. Food changes were made in the vending machines, indoor and outdoor walking paths were created, point of decision prompts were placed in areas close to elevators encouraging stairwell use, and educational materials were strategically placed throughout the organizations. (Gates & Brehm, 2010) Concerns were expressed by employees around environmental and safety concerns within the worksite as well as job security and stress. Employees felt that it was hypocritical of their employer to expect healthier eating and more physical activity among the workforce when their basic needs were not met. (Gates & Brehm, 2010) The challenges expressed in this article reinforce the need to follow a best-practice health promotion approach, whereby continuous input from the employee population helps to drive the intervention strategies. Equally as important is to ensure that the basic needs of employees are met prior to placing additional expectations on the employees.

Two large meta-analyses met the inclusion criteria. The first paper dates back to 1986 and discusses the ideal placement of worksite health promotion programs to successfully conduct interventions due in large part to their community-like environment and sophisticated

communication systems. (Sallis et al, 1986) The study's focus was to reduce cardiovascular risk through weight management, physical activity, tobacco cessation, stress reduction and other risk reduction interventions. An important message to gain from this study is the value of a holistic approach to worksite wellness programs. There are many influences that affect weight outside of lack of physical activity and/or poor nutrition. High levels of stress can also cause weight gain. In addition, there are conditions such as hypertension that require attention before embarking on a weight loss program. Success was seen with interventions that focused on relaxation training for hypertensive employees, incentive programs for weight loss, on-site exercise classes, worksite weight loss competitions, stress reduction programs and multi-risk factor interventions. (Sallis et al, 1986) The most effective worksite health promotion programs for employees involved multi-component strategies. (Sallis et al, 1986) One of the most obvious limitations of this meta-analysis is the age of the study. At this time there was little research being done in the field of worksite health promotion. However, in light of this early group of studies, it is promising to see the focus on multi-dimensional interventions instead of interventions occurring in separate silos.

The second meta-analyses focused on the effectiveness of worksite nutrition and physical activity programs to promote healthy weight. The results found in this systematic review form the basis of recommendations by the Task Force for Community Preventive Services. (Anderson et al., 2009) Specific interventions include education, weight loss programs, behavioral skill development, health screenings, structured exercise, and environmental and policy changes. An important finding in this group of studies showed that working conditions were directly correlated to overweight and obesity rates. (Anderson et al, 2009) Employee's who worked long hours, shift work or worked under stressful conditions had higher weight. Designing

interventions for these populations will be important for C.A.M. due to their varied workforce. Large improvements were exhibited when a multi-pronged approach was implemented; structured programs showed more promise than unstructured programs and incentives increased participation in all programs. (Anderson et al., 2009) In addition, the more intense the intervention, the greater the impact on weight loss, further acknowledging the dose-response theory. (Lemon et al, 2010) Employees participating in obesity prevention programs had more self-confidence, had better relationships with co-workers and management and have the potential to boost company profits by increasing productivity as well as reducing medical and disability costs. (Anderson et al, 2009)

The last systematic review meeting the inclusion criteria focuses on the financial return on investment of worksite programs to improve nutrition and/or increase physical activity. Three metrics were evaluated among the eighteen studies included: 1) return on investment (ROI), 2) benefit cost ratio (BCR), and 3) net benefits. (van Dongen et al, 2011) The study interventions were multi-component strategies including screenings, health coaching, environmental changes, nutrition education, web-based interventions, health seminars and communication campaigns. The ROI's and BCR's showed positive results during the initial years of implementation that included improving both nutrition and physical activity. On average, in the non-randomized studies (NRS) ROI for absenteeism was 200%, medical benefits was 22% and presenteeism, 246%. (van Dongen et al, 2011). However in the RCT's the results were not as promising. It is believed that the reason behind the negative RCT results is due to the well-controlled environment of a RCT and does not depict real life circumstances. (van Dongen et al, 2011) Additionally, these poor results may be attributed to the fact that RCT's are typically shorter in duration than NRS's. Behavioral changes and financial returns occur gradually over time

therefore a longer study duration could potentially reveal greater returns. (van Dongen et al, 2011)

Limitations: Review of Existing Evidence

The literature reveals some important limitations. First, research in the area of workplace health promotion is still in its early stages. Although the breadth of literature is rapidly growing, no solid methodology exists around ROI. There is not a defined approach for calculating ROI, leaving ROI still somewhat of a mystery. Employers can, however, compare absentee data trends, reductions in emergency department usage, increases in preventive care visits, improvements in employee morale, decreases in turnover and workplace injuries, and reductions in health risks, but tying a specific dollar savings to these metrics is challenging and often subjective, even for leading experts in the field. A second limitation that was apparent throughout much of the literature is the brief study duration around specific interventions. Behaviors and habits take time to evolve and improve. Therefore, to study a specific intervention for twelve, eighteen or even twenty-four months, is not an adequate amount of time to assess the true potential of an intervention.

Recommendations for Company A Municipality

Recommendations in this section are extracted from the findings in the literature and are being proposed for application at Company A Municipality's four worksites. These recommendations are multi-dimensional in that they include a variety of simultaneous programming to meet the vast needs of a varied workforce. Based on the organizational assessment, the majority of C.A.M.'s workforce is full-time and works various shifts. The literature suggests that shift workers experience poor health compared to their regularly scheduled co-workers and need to be a focus when planning a multi-pronged health and

productivity model. Throughout each recommendation that follows, employees working second and third shift need to be provided the same opportunities as those employees working first shift.

Multi-dimensional

Realized from the literature, the size, variance, applicability and intensity of workplace interventions to fight the overweight and obesity epidemic need to be multi-dimensional in order to reap the greatest benefits. It is recommended that C.A.M. implement and sustain a variety of strategies that are discussed in the following sections. Some of these strategies have been employed by C.A.M. while others should be considered for near future programming. Benefits to C.A.M. include reductions in chronic disease, improved employee morale, reduced absenteeism, increased productivity and long term stabilization of health care costs.

Employee Input

As seen in the organizational assessment, C.A.M. has gathered a great deal of employee input to help guide their wellness program. Focus groups, employee interest surveys and the formation of a diverse wellness committee have all been strategies that C.A.M. has adopted to help guide their efforts. These tools help to identify the areas that employees want the organization to focus. Without employee feedback, employees often feel they are being expected to do something they are not willing to do which can be detrimental to employee morale and can tarnish the programs reputation. Ongoing feedback will be vital to the growth and success of interventions to reduce overweight and obesity. C.A.M. must be sure to collect data from shift workers, as they may have a completely different set of needs and interests. Their input is equally as important to the program's success as first shift employees. Naturally, employee interests and needs will change as time passes, turnover occurs and leadership

personnel changes. All of which will affect the dynamics of the program. A wellness program with a strong foundation will wax and wane with the organization as it changes and evolves.

Health Screening

C.A.M. has conducted voluntary annual health screenings, but historically participation has been very low. Along with employee input, collecting health risk data is critical to deciding what interventions to design, implement and evaluate. Although, the participation among C.A.M. employees is low, the results show an undeniable need for weight management interventions in the areas of improving nutrition and increasing physical activity. This data can be extrapolated across the organization as oftentimes the healthiest or most health conscious of employees are the early adopters and the ones that participate on a voluntary basis. If this is truly the case then the need for weight management interventions is much greater. To this point, a greater number of employees participated in the annual interest survey and the results revealed a high interest among employees for programming in this area. It is recommended that C.A.M. provide larger incentives for participation in the health screening process. Incentives have shown to increase interest in worksite programming at various worksites. Two recommended options include tying participation to a health insurance premium incentive and/or providing a monetary incentive for all participants. As seen by the success of L.L. Bean's wellness program, a premium incentive boosted participation in the health screening to 87% of benefit eligible employees. (Tobenkin, 2013)

Spouse Inclusion

Habits are formed over time and through a variety of influences such as our environment, our family and friends, co-workers and media such as television, newspapers and now social media. All of which play a role in shaping our beliefs, our attitudes and our actions. Through

personal and professional experience, I can attest to the importance of having a spouse, family members and co-workers that share similar values. It goes without saying that having a supportive environment at home and at work helps the individual achieve their goals, whatever those goals may be. It's also safe to assume that if your spouse, partner, family members and co-workers exhibit unhealthy behaviors it creates barriers for the individual to make healthy choices. If your spouse is overweight, doesn't exercise and has no interest in eating healthy, you will likely face an uphill battle. The literature strongly supports the inclusion of spouses in wellness program interventions. Involving spouses/partners in activities such as health screenings, physical activities, nutrition counseling and health coaching has proven to be an effective way of reducing overall employer costs because spouses are an important driver of healthy and unhealthy behaviors. (Tobenkin, 2013) It is my recommendation that C.A.M. provides more opportunities for spouses to participate in all of their wellness program activities. Currently, C.A.M. provides discounts for employees and their families to take part in certain activities out in the community, but as far as on-site programming, little emphasis has been placed on spouses. From what we know to be true about the effect of incentives, the type of incentive offered will strongly influence their successful incorporation of spouses/partners as well how they communicate programs to employees and their families. Further, to create awareness of available wellness benefits, I recommend mailings to the employee's home, targeting the spouse/partner. Thinking of the spouse/partners as an equally important participant and driver of behavior and cost will serve C.A.M. well in reducing their overweight and obesity risk over time.

Behavior Modification

Behavioral interventions come in many forms including health coaching, nutrition counseling, mindfulness-based stress reduction, meditation and relaxation teachings as well as interpersonal support systems. All are focused on changing health behaviors and have showed promising results herein the literature. Some behavioral interventions can be cost prohibitive to employers with minimal budgets and other interventions may be benefits covered under the employer's health insurance plan. C.A.M. does offer nutrition counseling at no charge to employees/spouses enrolled in the Anthem Blue Cross Blue Shield health plan, but for those employees/spouses not enrolled in C.A.M.'s health insurance, the same level of benefit is unavailable. In general, the literature suggest that health coaching has shown very positive results for both employees and their spouse due to the coach's extensive training in Motivational Interviewing techniques as well as understanding the stages of change. In addition, accountability plays a major role in the health coach/employee or spouse relationship. If the individual sets a ten pound weight loss goal and knows they will have to follow up with their coach in six weeks and report on their progress, the individual is more likely to work hard to achieve that goal as opposed to not being accountable to anyone but themselves. However, health coaching is typically expensive and not all employers have the funding to support it. An interpersonal support system is recommended for C.A.M. employees and when possible, spouses/partners. Peer support groups help to improve changes in actual and perceived social norms. (Lemon et al, 2010) Walking groups, weight loss groups, nutrition support groups are all examples of interpersonal support systems that help build a culture of good health. Also recommended is an ongoing stress management program. Stress is a driver of weight gain and can be a monumental barrier to weight loss. If employees/spouses/ partners have a great deal of stress at work, at home, or both, they may use food as a stress reliever. Teaching stress reduction

techniques such as relaxation, meditation and resiliency will benefit the workforce especially due to the large number of employees in high stress positions. Web-based stress reduction tools can be used to meet the variety of employee/spouse/partner schedules as well as home-bound educational mailings. Web-based tools and home mailings are also vital to including spouses and partners as they will likely be unable to attend on-site programming.

Leadership Support

Leadership buy-in and support of wellness interventions promoting weight loss and weight management is one of the single most important aspects of a successful program to reduce obesity rates. Senior managers and supervisors need to set the example by walking the walk and talking the talk. They are single-handedly tasked with building the foundation of a culture of health. A strong and frequent message of support for the program and transparency around why there is such an emphasis on improving the health and well-being of all employees, spouses, partners and families needs to be an integral part of the strategy. Additionally, recognizing employees for their participation and success in the program needs to be a priority for C.A.M.'s leadership. Recognition provides another layer of enthusiasm, encouragement and motivation for employees to partake in the programs provided. C.A.M.'s leadership team is large and diverse, with most managers and supervisors embracing the organization's investment in wellness. However, some of the leadership staff is less supportive. Employees have reported fear of being reprimanded for engaging in physical activity during their break times or viewing various websites recommended by the wellness committee to promote better nutrition. It is my recommendation that managers and supervisors are measured on their support and participation in wellness through annual performance evaluations. C.A.M. does not currently offer merit

increases, but has in the past. I would recommend re-instating merit pay and rewarding those managers and supervisors that exhibit support for wellness through measurable actions.

Physical Environment

Changes to the workplace's physical environment can reduce and even eliminate many of the barriers that employees feel to be keeping them from being healthier. The literature suggests a variety of ways to alter the environment including healthy foods in the vending machines and at staff meetings, designing walking paths both indoors and outdoors, ergonomic evaluations of employee workstations, exercise equipment available for employees to use before, during and after work, point of decision prompts near elevators, and strategically posted educational materials throughout the worksite. It is my recommendation that C.A.M. implement all of these environmental changes. First, C.A.M. should offer healthier options in their vending machines. Currently they provide a variety of foods with little to no nutritional value. Including foods such as apples and bananas as well as healthy breakfast bars or instant oatmeal packages would give employees more options. Posting the nutritional value of all the foods in the vending machines will help employees make educated decisions before purchasing their snacks. All staff meetings should have healthy food options available. It's not to say that certain foods should be banned from the meetings, but the addition of healthy foods will give employees the choice.

Each worksite environment is quite different, in terms of their indoor and outdoor space. It is recommended that in the locations with larger facilities, an indoor walking trail be designed with markers for distance traveled. In the other facilities where outdoor space is more appropriate for walking trails, several routes can be mapped out and posted inside the building for employees to see. These routes can also be sent out via email to employees and posted on their intranet site.

It is recommended that each department have an ergonomic specialist assess their workstations and make recommendations for improvements. At this time, ergonomic assessments have been provided on an as needed basis, typically post injury. To reduce the occurrence of injuries, C.A.M. needs to invest in these services and be proactive rather than reactive. There is a tremendous need within many of the departments, i.e. communications, patrol, executive offices and all other staff positions that require a great deal of sedentary duties.

Each worksite is equipped with exercise equipment available for use by employees, such as cardio machines, free weights, stability balls, stretch bands, weighted hula hoops and snow shoes. There is also a library of exercise DVD's for employees to sign out. The challenge is finding the time to use the equipment. It is my recommendation that C.A.M. develop a flex-time policy allowing employees to have flexibility throughout their workday to engage in more physical activity. It is also recommended that C.A.M. implement a stretch break policy, encouraging employees to take a few minutes every hour to stretch. Sedentary work can cause injury over time, stretching is one of the simple and quick ways to prevent injury from occurring.

Points of decision prompts are another simple and inexpensive way to raise awareness. For example, prompts which are strategically placed near elevators advocating stairwell usage is one way to implement this strategy, but would only be appropriate in two of C.A.M.'s four worksites. The remaining two facilities are single level, but would benefit from point of decision prompts aimed at making healthier food choices. These can be placed near vending machines and in the break rooms. Additionally, reminders to drink more water throughout the day can be placed on refrigerators or next to the water cooler. Current methods for communication include postings in employee break rooms, next to time clocks, in restrooms and locker rooms. But the primary means of communication include email and bulletin board posters. I recommend the

current strategy be enhanced by ramping up the before mentioned methods of delivery and adding home mailings. This will not only help increase the knowledge, education and awareness of employees but will also target their family members.

Physical Activity & Nutrition Programs

C.A.M. currently offers physical activity/nutrition focused programs four times a year, or once per quarter. Each program typically runs for twelve weeks and is open to all employees. I recommend the continuation and frequency of physical activity/nutrition programs, but recommend that C.A.M. provide larger incentives for participation, either a monetary reward for completing the program or tying participation into a health insurance premium reduction. Incentives will be discussed further in the next section. Just recently, C.A.M. offered a 50% reimbursement to employees for attending a gym/health club or Weight Watchers class/Weight Watchers Online for a consecutive twelve weeks. Participation was high compared to other programs offered. It is recommended that this reimbursement program be offered twice a year so that employees who may not have been ready to make a change during the first session will have an opportunity to participate in the next session. Through C.A.M.'s Anthem Blue Cross Blue Shield health insurance, nutritional counseling is a covered benefit for employees and families on the plan. Frequently promoting this benefit as well as sending information home to the employee and family is recommended.

Incentives

Incentives play a large role in gaining participation in worksite health promotion programs. When first starting out, it's a good idea to incentivize participation alone through small incentives such as trinkets, water bottles and gift cards. Many worksite wellness programs take that first approach initially in order to set the stage for what's to come. A "feel good"

program is often what it's referred to by worksite health professionals. As the program grows there needs to be more emphasis on gaining larger participation numbers. In order to bring about change in health behaviors, reduce risk and stabilize health care costs, employers need to have high participation in the program. The early adopters are typically the ones that jump on board with wellness initiatives in the beginning stages. It's the late adopters and those that are skeptical of the programs that need to be targeted. With that in mind, employees should continue to be rewarded for their participation, but larger incentives should be considered. The literature is mixed in this arena, with some experts stating incentives won't result in lasting behavior change, while others feel just the opposite. During the literature review process, I can attest that there is more literature in favor of incentives than not, with incentives representing a major driving force for employees to engage in health promotion programs. I recommend that C.A.M. implement a health insurance premium discount for all employees who not only participate in the annual health screening but also complete at least one wellness program activity per year. With the new health reform laws taking affect in January 2014, employers will be allowed to charge employees up to 30% of the total cost of health insurance coverage for not meeting certain health contingencies. I am not recommending at this time that C.A.M. implement a health contingent program model, rather I am recommending the organization take the next logical step in that direction, requiring participation in specific activities to earn a premium discount on the health insurance. Following implementation of the new model, subsequent years should include participation by the spouses/partners in order to earn the premium discount. For those employees that are not on C.A.M.'s health insurance, an opportunity to earn monetary incentives for completing certain metrics is recommended. For example, rewarding participation in the health screening, partial reimbursements for Weight Watchers or health club memberships and

rewarding participation in wellness program activities that promote physical activity and proper nutrition.

Synthesis of Graduate Classes

Several graduate classes have influenced my capstone project. Namely, Social and Behavioral Health (the socioeconomic influence on health status, behavior change theories); Introduction to Epidemiology (to look objectively at research and identify the limitations); Community Health and Medical Care (researching vulnerable populations and the necessary safeguards needed to protect human subjects); Health Care Planning and Marketing (less is more, effective strategies for outreach); and, Quality and Outcomes of Healthcare (importance of process development to ensure that desired quality and outcomes are achieved).

APPENDIX 1

Focus Group Questions & Responses

- I. *What would help your department become healthier? What would help your family become healthier? How could the wellness program best support your health?*
- *Think about both your personal health and the health of the larger community.*
 - *Think about factors beyond medical and health care services.*

Department #1 Responses:

- Internal stressors are a BIG issue.
- Simple stress management techniques.
- Exercise equipment would be really helpful as there is ample space to set up equipment.
 - It is estimated that approximately 50% of the staff would use it during their breaks.
- Stretching program.
- Stretches to help with carpal tunnel.
- Back stretches to avoid injuries from lifting or bending.

Department #2 Responses:

- There were several interests expressed by employees and a lengthy discussion on flexibility for employees to be physically active during the day.
- They have a 2-mile loop around the facility that employees can walk, but it takes about 30-40 minutes and oftentimes that's too long to be away. The treadmill is a great solution.
- They have a treadmill and stationary bicycle in the kitchen but there is no privacy for employees to use it. They would like partitions to create a private space.
- They have a great deal of flexibility with their schedules, and have a relaxed and supportive atmosphere which makes them feel comfortable stretching, being physically active, and doing group activities.
- It was clear from the discussion that flexibility for employees to use time for exercise is allowed and embraced by supervisors at this location. The issues seem to be around food.
 - They have a nice kitchen and often cook meals for themselves in a group setting. They would be interested in having a nutritionist or chef come in and show them how to cook healthier food and spice it up so that it tastes good.
- Each attendee expressed family time as important and enjoys the activities that C.A.M. offers through the wellness program. It's difficult to offer functions for employees before and after work because of their family commitments.

Department #3 Responses:

- Group activities such as hiking clubs, bowling night, walking at lunch time.
- Group activities should be held on weekends and give employees an opportunity to get to know their co-workers.
- Walking group should be held on Thursdays at lunch time.
- Implement a stretching program: possible reminder built into the email system where at 10am and 2pm a reminder pops up to stretch for 5 minutes.
 - Provide employees with a list of 5-10 stretches they can do.

II. *How could management best support you making healthy choices? What incentives should be offered to encourage healthier choices? Should it be participation or outcomes based?*

Department #1 Responses:

- More flexibility on break times. Lunch and break times are strictly enforced.
- They do not have time to go for a walk outside the building and if they do they will be reprimanded if they are even a minute past their time.
- Participation and support by their supervisor would be helpful.
- They all feel as though they will get in trouble if they read wellness program emails, participate in the programs during their work time or if they are reading health and wellness related materials during the work day.
 - The facilitator explained to the staff that the wellness initiative is supported by management and that they have invested in this program. It is an expectation that employees will read the emails and wellness materials as well as participate in the program. No one should be reprimanded for participating.
- Incentives such as gas cards, Hannaford cards, farmer's market cards are all of interest. Small items are exciting to receive.

Department #2 Responses:

- Offering chair massages is popular among employees as a stress reliever.
- Diabetes education and stress management were topics of interest for future ideas.
 - Currently stress management consists of eating candy during the day.
- One attendee suggested to the group that (s) he would like to have a weekly meal together that they cook, but have it be healthy.
- Ergonomic assessment is important to the group. They have had trouble in the past getting someone to do an assessment.

Department #3 Responses:

- Leadership support through both word of mouth and also email reminders to employees encouraging them to participate in programs being offered.
 - Same supportive communications goes for stretching, walking at lunch, etc. It is important for leadership to not only be supportive verbally but also participate so that employees know that they won't be reprimanded for walking on their lunch break or taking a few minutes to stretch.
- It was suggested that we encourage supervisors to allow their employees to take a 30-minute break at lunch and use it for exercise and then be able to come back and take 15 minutes to eat their lunch.
- Challenges for C.A.M. are changing break and flex time policies. Re-negotiations with 5 different unions would need to take place for all employees to have equal benefits. Also, there are a number of employees who have second jobs and need to leave at their regular time in order to make it to their second job on time.
- Gym discounts were suggested. C.A.M. currently receives discounts at certain facilities.
- A voucher program for healthy foods at the supermarket was suggested, whereby County employees can get discounts on fruits and vegetables.

III. *In your opinion, what are some specific opportunities to advance the health and wellness within C.A.M. during the next few years?*

- *These can include opportunities to improve programs, policies, public awareness, the environment – whatever you feel is likely to impact health and wellness.*
- *They can include activities already underway, as well as potential opportunities that could materialize.*

Department #1 Responses:

- Most staff are not aware of what other companies are doing for wellness but think that all the before mentioned tools would be helpful: screenings, walking programs, exercise equipment available on-site, stretching programs for body overall, carpal tunnel and back.
- More time to be active and improve their health during the workday.

Department #2 Responses: Included under question II.

Department #3 Responses:

- Incorporate wellness into the annual recognition ceremony and acknowledge employees in several areas.
- C.A.M. needs to take another look at the vending machines. Due to the potential loss of money for offering healthy options, which have frequent expiration dates, the vendor has been unwilling to overhaul vending machine options.
- The topic of a food kiosk came up and was discussed.
- Utilizing location space for exercise equipment, such as balance balls, stretch bands, yoga mats, etc.

APPENDIX 2

TEMPLATE

Medical Claims Data Request

1. ***Top 25 diagnoses by category, by frequency and by cost, i.e.:***
 - Musculoskeletal
 - Cardiovascular: HTN & Cholesterol
 - Pulmonary
 - Neuromuscular
 - Mental health/depression

2. ***Pharmacy***
 - Top 20-25 drugs by category, frequency and cost
 - Unduplicated medication count (Account Representative)
 - retail vs. mail order
 - Generic vs. trade name/brand

3. ***ER Visits***
 - By diagnosis and dates (looking for what is showing up on weekends. It will drive patient education about seeking medical advice during the week...maybe use of nurse line can save money from extra tests, unnecessary labs and x-rays....not to mention the inconvenience of crowded weekend visits)
 - ER visits vs. health plan's book of business
 - Co-pays for ER visits
 - Co-pays for Urgent Care or Express Care visits

4. ***HEDIS report (health employer data information set) on preventive care***
 - Mammography's
 - Colonoscopies
 - Prostate Exams
 - Pap's + adult and viral immunizations
 - Immunizations – all other
 - Diabetes screening – A1C, foot exam, other applicable services

5. ***Medical costs for eligible employees vs. spouse vs. dependent. (There's usually a pie chart on this)***

6. ***Case Management***
 - The # of eligible vs. number enrolled in case management for organization by diagnosis.
 - What triggers a case management inquiry?
 - What is the process for outreach to the employee/spouse/dependent?

APPENDIX 3

Literature Review

Author(s), Source	Title	Year of Publication	Methodology Obesity	Sample Size	Purpose	Intervention(s)/ Finding(s)/ Recommendation(s)	Limitations
Center for Disease Control and Prevention retrieved from: http://www.cdc.gov/chronicdisease/pdf/2009-Power-of-Prevention.pdf	The Power of Prevention	2009	Tobacco & Obesity Informational Review	N/A	More than 75% of health care spending is on people with chronic disease. This report looks at the scope of chronic disease, specifically obesity and respiratory conditions caused by smoking as well as other risky behaviors, costs associated and the power of prevention.	Intervention(s): Combination of health promotion activities, screening at-risk populations as well as disease management. Recommendation(s): The CDC identifies specific areas to fight against chronic disease: well being, policy promotion, health equity, research translation and workforce development. Finding(s): To reduce chronic disease across the country, we have to rethink our health care system. It is important to have a coordinated, strategic prevention approach that promotes healthy behaviors, expands early detection and diagnosis, supports people of every age, and eliminates health disparities.	N/A
Hunnicutt, D. <i>WELCOA's Advantage: 6, 8, 4-11</i>	Choosing Appropriate Interventions	2007	Organizational Assessment	N/A	This article describes the importance of choosing interventions tailored to targeted populations in an attempt to bring about	Intervention(s): N/A Recommendation(s): Be sure to collect data on the population being targeted, identify the participation goal and announce it,	N/A

					behavior change. The article outlines 11 important questions to consider.	identify incentives and how they will be distributed, know the timeframe of the intervention, communicate the program effectively, offer programs to all shifts and locations, know how much money, time and space the program needs to be successful, seek legal counsel as needed and determine necessary waivers for individuals that cannot meet the intervention standards, know how the intervention will be evaluated, and identify the person responsible if something goes wrong. Finding(s): N/A	
Mokdad, A.H., Marks, J.S., Stroup, D.F., Gerberding, J.L. <i>JAMA. 2004; 291:1238–1245</i> <i>doi:10.1001/jama.291.10.1238</i>	Actual causes of death in the United States	2000	Tobacco, Poor Diet & Physical Inactivity Literature Review	N/A	Modifiable behavioral risk factors are leading causes of mortality in the U.S. Understanding these risk factors will provide insight into the effects of recent trends and the consequences of missed prevention opportunities. This study look at these trends and recommends more focus on preventive measures.	Intervention(s): N/A Recommendation(s): Establish a preventive focused health care system in the U.S. Finding(s): Analyses show that smoking is the leading cause of mortality. Poor diet and physical inactivity may soon replace tobacco as the leading cause of death. These findings, along with growing health care costs and an aging population, show an undeniable need to establish a more preventive focus in our nation’s health care and public health	-The study reports the causes of mortality in the U.S. However, the causes are also associated with a tremendous morbidity burden. In addition to early death, years of lost life, reduced productivity, high disability rates, and decreased quality of life is also strongly associated with these causes. Additionally, using all-cause mortality may result in overestimating the number of deaths from

						systems.	specific causes. -The analyses did not assess the effect of genetics. -Lastly, the study did not look at the effects of high blood pressure and cholesterol on mortality, although some of the effects of these risks come from poor diet and physical inactivity.
Finkelstein, E.A., Trogon, J.G., Cohen, J.W., Dietz, W. <i>Health Affairs</i> , 28, 5: w822-w831	Annual Medical Spending Attributable to Obesity: Payer-And Service-Specific Estimates	2009	Obesity Data collected from the 1998 and 2006 Medical Expenditure Panel Surveys (MEPS)	1998: 10,597 adults; 2006: 21,877 adults	This analysis provides estimates on the cost of obesity for the United States across all payers (Medicare, Medicaid, and private insurers); in separate categories for inpatient, non-inpatient, and prescription drug spending.	Intervention(s): N/A Recommendation(s): Adopting policy and environmental changes that go beyond the way health care is financed and delivered. Finding(s): Across all payers, obese people had a per capita medical spending that was 42% greater than spending for normal-weight people in 2006. In 1998 the per capita spending increase related to obesity was several hundred dollars less than the 2006 estimate. In 2006, the per capita percentage increase in spending for private payers was 58%.	-The study data is self-reported height and weight. -There was lack of statistical significance in some regressions which could be attributable to the small sample size. -The regression-based approach does not allow for dividing spending across specific diseases or the specific behavior that causes excess weight. It is suggested that this should be an area of future research.
Levi, J., Segal, L.M., St. Laurent, R., Kohn, D.	F as in Fat: How Obesity Threatens America's Future	2011	Obesity 2007-2009 (average of 3 years) BRFSS	BRFSS data collected from 50 U.S. States, D.C., Puerto Rico, Guam	The report illustrates the obesity epidemic, direct and indirect costs, chronic disease prevalence and the	Intervention(s): N/A Recommendation(s): Ensuring schools provide food and beverages that meet or exceed the <i>Dietary</i>	-BMI is not the best predictor of health as it doesn't differentiate between fat and muscle. When

<p><i>Robert Wood Johnson Foundation; Trust for America's Health</i></p>			<p>data sample collected on 1,217,016 observations compared to 2008-2010 (average of 3 years) BRFSS data sample collected on 1,235,441 observations.</p>	<p>and the Virgin Islands. Researchers used sample weights provided by the CDC to reduce bias in population estimates.</p>	<p>importance of implementing change within all school, community, government and business environments.</p>	<p><i>Guidelines for Americans</i>, increase access to high quality, affordable foods within communities, increase physical activity during the school day, improve the built environment to support physical activity, use pricing strategies to eliminate barriers to healthy foods and reduce youth exposure to food marketing by initiating policies and regulations in the food industry. Finding(s): If obesity rates continue on their current path, by 2030, 13 states could have adult obesity rates above 60 percent, 39 states could have rates above 50 percent, and all 50 states could have rates above 44 percent. If the state's obesity rates continue to climb, the number of new cases of type 2 diabetes, coronary heart disease and stroke, hypertension and arthritis could increase 10 times between 2010 and 2020—and then double by 2030.</p>	<p>considered in conjunction with other factors such as waist circumference, waist to hip ratio, BP, chol. and blood sugar it may better indicate the accuracy of population obesity statistics.</p>
<p>The United States Department of Labor: Bureau of Labor Statistics</p>	<p>American Time Use Survey</p>	<p>2011</p>	<p>Continuous survey conducted by the U.S. Census Bureau for the Bureau of Labor</p>	<p>12,500 individuals were interviewed</p>	<p>The survey is conducted to gain knowledge about the various daily activities individuals 15 years or older take part in.</p>	<p>Intervention(s): N/A Recommendation(s): N/A Finding(s): According to the 2011 Bureau of Labor Statistics report, on average, employed</p>	<p>N/A</p>

retrieved from: http://www.bls.gov/news.release/atus.nr0.htm			Statistics			Americans work 7.6 hours Sunday through Saturday with those that work Monday through Friday average 8 hours/day.	
Gates, D., Brehm, B., Hutton, S., Singler, M., Poepelman, A. AAOHN Journal: 54, 12, 515-520	Changing the Work Environment to Promote Wellness A Focus Group Study	2006	Obesity Research	Four manufacturing companies	Using a community based participatory research model (CBPR) a variety of experts came together in this study including academic researchers, health education specialists and managers from four different manufacturing companies. Together, they developed strategies to prevent and reduce obesity through environmental changes at the worksite. The study used the Diffusion of Innovations Theory.	Intervention(s): Five interventions were identified: walking paths, food changes, signs, educational strategies and advisory groups. Recommendation(s): Changes in the built environment helped set the stage for employees to achieve their individual wellness goals. Finding(s): The results of the interventions revealed that environmental change is an important place to begin wellness program efforts. By reducing barriers to better nutrition and physical activity employers will likely reduce or prevent obesity and the associated chronic disease burden.	N/A
DeJoy, D.M., Wilson, M.G., Goetzel, R.Z., Ozminkowski, R.J., Wang, S., Baker, K.M., Bowen, H.M., Tully, K.J. Journal Occup Environ Med.;	Development of the Environmental Assessment Tool (EAT) to Measure Organizational Physical and Social Support for Worksite Obesity	2008	Obesity: Assessment tool used for environmental analysis	12 Dow Chemical Company sites	The purpose of this paper was to describe the development, reliability, and validity of the Environmental Assessment Tool (EAT), which assesses the physical and social environment of a worksite in terms of its support of obesity	Intervention(s): Interventions were preceded by one year of research and intervention design. EAT was developed during that research period in three stages: 1) contextual analysis and literature review, 2) prototype development, and 3) pilot testing. It was	- Sites are penalized if certain environmental supports that may not be feasible (e.g., cafeteria) are not present. - The tool needs to be customized to the specific work environment and is not uniform for all

<p>50(2): 126–137.</p> <p>doi:10.1097/JO M.0b013e31816 1b42a.</p>	<p>Prevention Programs</p>				<p>prevention efforts. EAT was developed by the National Heart, Lung, and Blood Institute (NHLBI) research initiative to study the impacts of workplace interventions that focus on environmental changes or a combination of environmental and individual strategies to prevent obesity among workers.</p>	<p>used to document the physical and social environments that may influence healthy eating and physical activity.</p> <p>Recommendation(s): NA See limitations section.</p> <p>Finding(s): Preliminary analyses indicated that EAT may be reliable in measuring the physical and social environments at the worksite, specifically related to PA, food choices, weight management, and general worksite characteristics that support health promotion for employees. Generally speaking, employees who worked in environments that promote healthier eating, more physical activity, and possess organizational characteristics that support healthy behaviors have lower costs, especially regarding absenteeism.</p>	<p>organizations.</p> <ul style="list-style-type: none"> - Those responsible for implementing EAT need to have specialized training. - The program being evaluated was new (only one year old). Further research is needed to examine a fully developed program/ - This analysis did not examine the ability of EAT to predict future relationships between environmental factors and health behaviors, health risks (e.g. BMI), or disease conditions related to obesity, lack of physical activity, and poor nutrition.
<p>Hersey, J., Williams-Piehot, P., Sparling, P.B., Alexander, J., Hill, M.D., Bandel Isenberg, K., Rooks, A., Dunet, D.O.</p>	<p>Promising Practices in Promotion of Healthy Weight at Small and Medium-Sized US Worksites</p>	<p>2008</p>	<p>Obesity</p>	<p>9 worksites with approx. 100 to 3,000 employees from a pool of worksites with exemplary health promotion programs</p>	<p>The report discusses a newly developed evaluation method to identify promising practices for promoting healthy weight among employees at small and medium-sized worksites. They used a method called Swift Worksite Assessment</p>	<p>Intervention(s): A site visit over 2 sequential half-days at each site included interviews with senior management, program staff, vendors, and wellness committees; observation guided by a written environmental assessment; and a structured review of</p>	<p>-Results may have been affected by self-selection (i.e., employees who participate in health promotion programs may be more motivated than non-participants), differential attrition (i.e., employees who</p>

<p><i>Preventing Chronic Disease Public Health Research, Practice and Policy; 5(4), 1-11.</i> http://www.cdc.gov/pcd/issues/2008/oct/07_0172.htm</p>					<p>and Translation (SWAT), developed specifically to evaluate worksites one at a time by using predetermined criteria.</p>	<p>program data on health outcomes of program participants. The team reviewed findings from interviews, observations, and aggregate data on health outcomes of participants. Using the site visit reports, the project team and a separate panel of experts identified worksite health practices that were promising, innovative, feasible to implement in a variety of settings, sustainable, and relevant for public health. These practices included peer coaching, wellness screening using motivational interviewing and follow-up, free access to fitness facilities, and incentives such as days of paid leave for participation in wellness programs. Use of incentives was associated with higher participation rates. To build the business case for their programs, staff at several worksites used aggregate data on decreases in high blood pressure, cholesterol, and body weight in longitudinal samples of program participants. Recommendation(s): NA Finding(s): Successful</p>	<p>are making progress toward health goals may be more likely to stay in a health promotion program than those who are not as successful), or secular trends (i.e., other changes in the community). - Worksite staff tended to gather data on self-reported changes in behavior. - Most worksites recorded height and weight, yet change in weight status over time was not always reported. - They also noted the need for longitudinal data to demonstrate changes in health behavior or maintenance of weight loss.</p>
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						worksite strategies encompass individual, environmental, and organizational factors.	
Merrill, R., Aldana, S.G., Garrett, J., Ross, C. <i>Journal of Occupational and Environmental Medicine; 53 (7), 782-787</i>	Effectiveness of a Workplace Wellness Program for Maintaining Health and Promoting Healthy Behaviors	July 2011	Obesity	3737 individuals employed continuously from 2007-2009. 70.9% were men and 29.1% were women.	This study assessed the effectiveness of a worksite wellness program involving cash redeemable reward points for encouraging, adopting and maintaining healthier lifestyles.	Intervention(s): The <i>Reaping Rewards Program</i> was developed after reviewing numerous successful wellness programs. Reaping Rewards includes monetary incentives for numerous “good-health behaviors,” such as physical examinations, attendance to educational lunch programs focused on nutrition, fitness, and related topics; screenings for early detection of glaucoma, diabetes, skin conditions, and other problems; classes in CPR and first aid; aerobic exercise and strength-training classes; and other programs that promote wellness and healthy behaviors. Employees who participate in the program earn points that can be exchanged for cash up to an annual maximum of \$150. Recommendation(s): Incentives are an effective means of stimulating individuals to make healthier choices. Finding(s): Healthy	-The design of the study only allowed the worksite to evaluate the effect of the program on participants. Without a comparison group they are limited on evaluating the true impact of the incentive structure for encouraging participation. -More than 75% of employees had been participating in the wellness program prior to 2007. Therefore, improvements in behaviors among high-risk individuals is likely underestimated.

						<p>People 2010 reported that higher risk employees are less likely to participate in worksite wellness programs. Among obese individuals, there were significant improvements in fruit and vegetable consumption, fat intake, and alcohol use. In addition, although reward points were not linked with receiving mental health care, improvements occurred among obese participants in several of the mental health indicators (e.g., feeling calm and ability to cope with stress). The wellness program led to improved biometric results and in maintenance of good biometric scores. Among employees who were obese at baseline, significant changes in selected mental health and dietary variables were exhibited. Those who lowered their BMI tended to decrease their fat intake and increase their weekly activity level, experienced greater feelings of calmness and ability to cope with stress; and had more energy.</p>	
Taylor, M., Bithoney, W.	10 Steps to Developing a Culture of	October 2012	Obesity	350,000 hospital employees and	This white paper offers a framework for population health	Intervention(s): 10 steps outlined in this paper are at the core of every	-The strategies noted in this study were specific to healthcare

	<p>Health for Hospital and Health System Employers</p>			<p>their dependents from 200 hospitals and compared the results to 12 million covered lives from other industries.</p>	<p>management in the hospital setting and outlines 10 best practices for implementing a successful worksite health initiative. It also provides a foundation for understanding how these concepts could apply to the broader development of an Accountable Care Organization (ACO).</p>	<p>successful worksite implementation to build a culture of health. Recommendation(s): The 10 key elements outlined were: 1) Alignment between HPM and overall business strategy; 2) Interdisciplinary team focus; 3) An identified champion, 4) Senior management as key leaders of the team; 5) Heavily engaged staff members dedicated to prevention, health promotion, and wellness; 6) An emphasis on quality of life improvement, not cost cutting; 7) Systematic measurement of ROI; 8) Continuous communication throughout the organization; 9) Constant improvement by learning from others; 10) Having fun Finding(s): Recommended actions: 1) Analyze the health risk of your specific population; 2) Define goals, quantify objectives, and identify gaps based on your population's health risk; 3) Build a business case based on your specific health benefit plan design; 4) Get buy-in from senior management; 5) Establish a measurement strategy; 6)</p>	<p>workers although are translatable to all industries.</p>
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						<p>Review, revise, and align policies and procedures to support a healthy workplace; 7) Design or modify programs and incentives to fit your overall goals; 8) Develop an ongoing communication strategy using multiple channels; 9) Measure your progress and adjust your programs accordingly; 10) Ensure a sustainable culture of health</p> <p>-The study concluded that a health system with 16,000 eligible employees would save \$1.5 million annually for each 1 percent reduction in health risk.</p>	
<p>Health Enhancement Systems</p> <p><i>Retrieved from: www.HealthEnhancementSystems.com</i></p>	<p>Produce first...The Compelling Case for Simplifying Workplace Nutrition Programs</p>	2011	Obesity	NA	<p>This paper focuses on a produce-based approach to workplace nutrition programs promising higher productivity, increased maintenance of healthy changes, cost-effective improvements, and a positive impact on the bottom line.</p>	<p>Intervention(s): This approach is an easy to remember message: Think of and eat <i>produce first</i>, other foods next; give fruits and vegetables top priority.</p> <p>Recommendation(s): Simplicity is the foremost ingredient for promoting long-term diet change.</p> <p>Finding(s): Employers who implement and support workplace nutrition initiatives like <i>produce first</i> see immediate gains such as reduced absenteeism, higher productivity, and increased retention, in</p>	NA

						addition to long-term reductions in healthcare costs.	
<p>Barbour, V., Clark, J., Jones, S., Norton, M., Simpson, P., Veitch, E.</p> <p><i>PLoS Med</i> 8(12): e1001152. doi:10.1371/journal.pmed.1001152</p>	Poor Diet in Shift Workers: A New Occupational Health Hazard?	December 2011	Obesity	NA	This study, with 18–20 years of follow up, is the best evidence yet for the link between shift work and type 2 diabetes. There is now good evidence that “[p]roper screening and intervention strategies in rotating night shift workers are needed for prevention of diabetes.”	<p>Intervention(s): NA</p> <p>Recommendation(s): Public health advocates feel that action is necessary. Governments need to legislate to improve the habits of consumers and take specific steps to ensure that it’s easier and cheaper to eat healthy than not.</p> <p>Finding(s): NA</p>	NA
<p>Lemon, S. C., Zapka, J., Li, W., Estabrook, B., Rosal, M., Magner, R., Andersen, V., Borg, A., Hale, J.,</p> <p><i>Am J Prev Med.</i>; 38(1): 27. doi:10.1016/j.amepre.2009.08.028.</p>	Step Ahead: A Worksite Obesity Prevention Trial Among Hospital Employees	January 2010	Obesity	Random sample of 806 employees was selected to represent the workforce of six hospitals in central Massachusetts	The National Heart Lung and Blood Institute (NHLBI) launched an initiative, <i>Overweight and Obesity Control at Worksites</i> . The NHLBI funded seven worksite projects nationwide to test the effectiveness of interventions aimed at preventing and reducing overweight and obesity. This paper describes the results of one of these projects, the <i>Step Ahead</i> trial. This study investigates the relationship between participation in interventions with weight gain prevention. The trial was 2 years long.	<p>Intervention(s): A Social marketing campaign, environmental strategies promoting physical activity, environmental strategies promoting healthy eating, strategies promoting interpersonal support and strategies targeting individual knowledge, skills and behavior were all employed.</p> <p>Recommendation(s): The intervention had a dose response relationship with BMI, with improvements proportional to the extent of participation.</p> <p>Finding(s): Employees in intervention sites reported significantly greater improvements in perceptions of</p>	<p>-The relatively brief time period of the study – just 2 years.</p> <p>-Interventions were not targeting shift workers.</p> <p>-Due to the nature of their work, employees may have been unable to attend events due to patient care responsibilities.</p> <p>-Low baseline response rate.</p> <p>-All of the data collected were based on self-report.</p> <p>-The study group was so large that they could not target specific populations.</p>

						organizational commitment to employee health at 12 and 24 months compared to control sites, but there was no impact on perceptions of social norms. The greater the participation the greater the results.	
Health Enhancement Systems <i>Retrieved from: www.HealthEnhancementSystems.com</i>	How Financial Incentives/ Disincentives Undermine Wellness Making wellness rewarding without rewards	2012	Obesity	NA	This article discusses the use of incentives and its potential negative impact on behavior change. Instead, the article describes 20 recommendations for building internal motivation.	Intervention(s): See the 20 recommendations in the document for successful interventions... Recommendation(s): How to build intrinsic motivation: Communicate a meaningful rationale for wellness programming; respect the need for autonomy; reward cooperation not outcomes; make it easy for employees to track and celebrate progress; emphasize the fun factor, and offer programs more than once a year so employees can join when they're ready. Finding(s): - Respondents identify praise from their supervisors, attention from leadership, and the chance to lead projects as equal or more effective motivators than cash bonuses, better pay, and stock options. - The degree of work satisfaction, work engagement, and well-	NA

						being was been linked to employees' desire for autonomy, competence, and feeling connected. -Financial incentives are found to crowd out internal motivation.	
Sallis, J. F., Hill, R. D., Fortmann, S. P., Flora, J. A. <i>Progress in Behavior Modification; 20, 161-197.</i>	Health Behavior Change at the Worksite: Cardiovascular Risk Reduction	1986	Obesity	Large meta-analysis	This report is a meta-analysis of research conducted in WHP prior to 1986. The paper looks at behavioral techniques that have shown promise in their ability to promote heart healthy behavior changes in the areas of cigarette smoking, blood pressure, overweight, hyperlipidemia, Type A behavior, and sedentary lifestyle.	Intervention(s): <i>Behavioral interventions at the worksite:</i> The most promising intervention for hypertension was relaxation training. <i>Smoking cessation programs:</i> Multi-component interventions and incentive program revealed the highest cessation rates. <i>Worksite physical activity programs:</i> Exercise programs that didn't require expensive facilities were more likely to be adopted by large employers. <i>Worksite Weight loss programs:</i> The most promising interventions included incentives and worksite competitions with public notice of group weight loss prominently displayed. Incentive programs have been proven to be more effective to gain participation compared to group programs. <i>Worksite stress reduction programs:</i> Meditation and relaxation were the effective stress	This study is rather old and at this time there was little research being done in the field of worksite health promotion. Each area mentioned in the intervention column had several limitations, mostly lack of methodological rigor.

						<p>reduction techniques. <i>Multiple risk factor programs:</i> Multiple programs occurring together have proven most effective with the use of a HRA to evaluate risk. Recommendation(s): More research needs to be conducted. Finding(s): The most effective interventions for employees with CVD were multi-component interventions, relaxation and meditation techniques.</p>	
<p>Health Enhancement Systems</p> <p><i>Retrieved from: www.HealthEnhancementSystems.com</i></p>	<p>Employer-Sponsored Weight Management Programs The Business Case</p>	2011	Obesity	Multiple study results	<p>This paper highlights the enormous costs and risks associated with the increasing overweight and obese population.</p>	<p>Intervention(s): See recommendations. Recommendation(s): Eating patterns to maintain for a healthy weight long term are described below: Eat Breakfast; 5+ fruits and veggies a day; Eat whole grain products; Water is the best choice for weight loss. Walking is the best exercise for all demographics due to low cost, easy, natural, safe, low impact and is a stepping stone for all other exercises. Whether or not overweight or obese employees lose pounds, regular exercise can improve outcomes: heart disease and stroke, diabetes, gestational diabetes, depression,</p>	NA

						<p>overall mortality. Eating healthfully also contributes to all health condition risk reduction.</p> <p>Finding(s): Costs associated with overweight and obesity are described below:</p> <ul style="list-style-type: none"> -Obesity costs employers more than \$12 billion each year in increased healthcare utilization, reduced productivity, and higher absenteeism -Obesity-related disabilities cost employers an average \$8720 for each claimant -Among women, obesity is linked to depression — another major medical claim cost driver for employers -Annual healthcare costs are 11% higher among obese vs. non-obese people (36% higher inpatient and outpatient costs, 45% more inpatient days, and 77% higher medication costs). - The 66% of the population that is overweight or obese will continue to drive healthcare expense at more than twice the rate of inflation, further crippling industries that need every advantage to compete effectively in the global 	
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						<p>market.</p> <ul style="list-style-type: none"> - Obesity in the workplace showed that 3-year medical care costs were 52% higher for participants with an “at-risk” BMI (27.3 or higher for women, 27.8 or higher for men); in addition, the average 3-year absenteeism cost for at-risk participants was \$863 greater than that of lean participants. - Inactivity, a primary contributor to overweight and obesity, costs \$670-\$1125 a person annually. 	
<p>Allen, J. R.</p> <p>Health Enhancement Systems</p> <p><i>Retrieved from: www.HealthEnhancementSystems.com</i></p>	<p>Achieving a [Culture] of Health The Business Case</p>	2008	Obesity	White Paper	<p>Workplace culture is a key to profitability, sustainability, and other success measures and is discussed in detail in the paper.</p>	<p>Intervention(s): Culture change is a long term process that is best achieved systematically. Four steps: preparation, involvement, integration, and sustainability.</p> <p>Recommendation(s): Cultures are complex systems; they're best understood and evaluated by adopting a framework – such as Normative Systems, the subject of more than 50 books and journal articles. It identifies 5 primary culture elements: Shared values/priorities, Norms, touch points (touch points are the ways to establish and maintain norms. They're found in formal policies,</p>	NA

						<p>procedures, and programs as well as informal, unwritten social mechanisms.), work climate and peer support.</p> <p>Finding(s): The focus is on collective action — how people can work together to achieve wellness. Individual strategies (such as health risk appraisals, online information, wellness coaching, and incentive campaigns) can be combined with culture strategies to achieve higher lifestyle change success rates.</p>	
<p>Aldana, S.</p> <p><i>WELCOA's Absolute Advantage Magazine, 6(4), 22-29.</i></p>	<p>The Costs of Unhealthy Behaviors: Data Collection Is Only Useful If You Have Something To Compare It To...</p>	2007	Obesity	NA	<p>In this interview, nationally recognized expert, Dr. Steve Aldana sat down with WELCOA President, Dr. David Hunnicutt to discuss the incidence, prevalence and costs of unhealthy behaviors in the U.S.</p>	<p>Intervention(s): The more intensive and more comprehensive the strategy, the better. It's similar to a dose response: the bigger the dose, the more employees respond. Therefore, just a health risk appraisal will have some impact, but it will be very small. A health risk appraisal that's followed up by walking programs and competitions between departments are going to have an even greater impact than if you just did a HRA as a stand alone.</p> <p>Recommendation(s): Dr. Aldana's advice to employers is to make</p>	NA

						<p>interventions as intensive and comprehensive as possible.</p> <p>Finding(s): About 78-80% of the entire U.S. population does not get enough physical activity to get the benefits. The diet piece plus sedentary living are both contributing to the obesity epidemic. It's estimated that sedentary living costs us as a nation \$150 billion. This is in 1987 dollars. Fifteen percent of all of the healthcare costs we pay in the United States is due to sedentary lifestyles.</p>	
<p>Tobenkin, D.</p> <p><i>Retrieved from: HR Magazine, 63-64.</i></p>	<p>Stay Well Together: When employers extend wellness programs to employees' families, everyone benefits.</p>	February 2013	Obesity	NA	<p>A 2012 report from HERO found that spouses (among 788 employers surveyed) typically represent only about 1/5 of those covered under an employer-sponsored health plan, yet the average medical costs are about 30% higher for spouses than for covered employees. Spouses are important drivers of healthy and unhealthy behaviors.</p>	<p>Intervention(s): Inclusion of family members that reside on the employer's health plan is an effective way to lower employer health care costs and drive employee participation.</p> <p>Recommendation(s): Employers should be cautious about tying incentives to family participation if family members are not covered on the benefit plan. Such incentives could violate specific laws and regulations.</p> <p>Finding(s): Participation rates are often 40% lower without incentives. In January 2014, the new</p>	NA

						health reform laws will allow employers to increase incentives to 30% and up to 50% for anti-tobacco programs.	
Romney, M.C., Thomson, E., Kash, K. <i>Population Health Management</i> 14 (3); 127-132.	Population-Based Worksite Obesity Management Interventions: A Qualitative Case Study	2011	Obesity: best-practice interventions	8 employers and 1 health care advocacy group: # of employees within each co. ranged from 1400-180,000.	The aim of this study was to explore promising employer-sponsored population-based obesity management programs. A case study that utilized a telephonic questionnaire was conducted with small and large employers located in different regions of the U.S. that had been recruited to participate.	Intervention(s): See checklist in the study of all recommended interventions. Recommendation(s): The main themes for all employers included: program management and staffing, senior management support, employee screening, wellness committees, program design, nutrition programs, physical activity programs, behavioral health programs, communication, incentives, participation and evaluation. Finding(s): Each program tracked and reviewed data however ROI assessments had not been performed in every case. Therefore, the case study findings are subject to self-report,, interpretations, and biases. Maintaining the privacy of the participating organizations prevented the disclosure of detailed information about each program. A larger scale quantitative study with both a randomized	-Sample size was small. - Because of the selection process, not every business type participated in the study (e.g., government employers, primary and secondary educational institutions, and non-profit health organizations), in turn limiting the generalizability of the results. - Sample selection was not randomized and was open to selection bias.

						and broader spectrum of employers could provide a more representative sample.	
Anderson, L.M., Quinn, T.A. Glanz, K., Ramirez, G., Kahwati, L.C., Johnson, D.B., Ramsey Buchanan, L., Roodly Archer, W., Chattopadhyay, S., Kalra, G.P., Katz, D.L., Task Force on Community Preventive Services <i>Guide to Community Preventive Services</i> <i>American Journal of Preventive Medicine</i> 37(4); 340-358.	The Effectiveness of Worksite Nutrition and Physical Activity Interventions for Controlling Employee Overweight and Obesity A Systematic Review	2009	Systematic Review	47 studies qualified for analysis	This report provides results of a systematic review around effectiveness of nutrition and physical activity programs to promote healthy weight among employees. These results form the basis for the recommendations by the Task Force on Community Preventive Services.	Intervention(s): Weight-related outcomes, including weight in pounds or kilograms, BMI, and percentage body fat were used to assess effectiveness of these programs. Behavioral skill development, education, structured programming, weight loss programs, health screening, structured exercise, environmental and policy changes were all evaluated. Recommendation(s): A multi-pronged approach revealed bigger improvements. Structured programs were more effective than non-structured ones. Incentives increased participation. Finding(s): Worker overweight or obesity has shown a correlation between higher BMI and long work hours, shift work, and job stress. - Among the group of studies comparing an intervention arm with other intervention arms, when more intensive modes of intervention were provided to participants there	- This review looked at weight-related outcomes only. Many other physical and mental health effects were not evaluated, nor were possible benefits related to productivity or absenteeism.

						<p>appeared to be an increase in program outcomes.</p> <p>- Obesity prevention programs at the worksite may not only enhance employee self-confidence and improve the relationship between management and labor but also have the potential to boost profits of the companies by increasing employee productivity and reducing medical care and disability costs.</p>	
<p>Gates, D.M., Brehm, B.J.</p> <p><i>American Association of Occupational Health Nurses, 58(3), 117-122. doi:10.3928/08910162-20100216-02</i></p>	<p>Challenges of a Worksite Health Promotion Project</p>	2010	RCT	341 employees randomly selected; 8 small manufacturing companies	<p>This paper discusses the unique opportunities to develop health promotion interventions and policies to improve the health of employees. With that in mind, worksite promotion efforts are not without challenges. Although health promotion is oriented toward preventing disease and injury, increasing longevity, and improving quality of life, differences in individuals' beliefs and values about health and the role of both government and employers in health promotion do exist.</p>	<p>Intervention(s): Focus groups were assembled to help decrease employees' feelings of paternalism. Food changes were made in vending machines and in one cafeteria; walking paths were created both indoor and outdoor; point of decision prompts were placed near elevators, vending machines, etc.; educational materials put in the lunch rooms; and an Employee Advisory Committee was formed to collect data and revise interventions as needed.</p> <p>Recommendation(s): Managers should consider the potential challenges and ethical issues associated with health promotion programs and request input from</p>	NA

						<p>employees during both the development and implementation of wellness programs. Strategies must be developed to relieve employee concerns.</p> <p>Finding(s): The first ethical dilemma was related to whether it was appropriate for management to promote healthy eating and PA when the company was not meeting the employees' concerns around safety, security, and stress.</p> <ul style="list-style-type: none"> - Some employees voiced that health promotion efforts infringed on their freedom of choice. - Employees who engage in risky behaviors or had one or more chronic diseases are becoming increasingly concerned that their employers will discover reasons to terminate them if they are perceived as being a potential cost center due to health care expenses. 	
U.S. Department of Health and Human Services	The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke,	2012	Assessment Tool	NA	The purpose of this manual is to assist employers with using <i>The CDC Worksite Health ScoreCard (HSC)</i> to assess their health promotion programs, identify	Intervention(s): The CDC Worksite Health ScoreCard (HSC) is a tool designed to help employers assess whether they have implemented evidence-based health promotion interventions in their	NA

	& Related Health Conditions				gaps, and prioritize high-impact strategies to prevent several health risks.	worksites to prevent heart disease, stroke, and related conditions such as hypertension, diabetes, and obesity. Recommendation(s): The CDC recommends that employers form a small team, representing different departments to complete the survey together. Because a strong knowledge of the organization and its health promotion program(s) is recommended to accurately complete the scorecard, aim to choose team members with varied job positions. Finding(s): The approach that has proven to be the most effective is an evidence-based, comprehensive health promotion program that includes risk reduction programs, combined with environmental supports for healthy behaviors and is coordinated and integrated with all other wellness activities.	
Dongen, J.M., Proper, K.I., van Wier, M.F., van der Beek, A.J., Bongers, P.M., van Mechelen, W.,	Systematic review on the financial return of worksite health promotion programmes aimed at	2011	Systematic review	18 studies reviewed	This systematic review summarizes the current evidence on ROI of worksite health promotion programs aimed at improving nutrition and/or	Intervention(s): Three metrics were calculated per study: the net benefits (NB), benefit cost ratio (BCR) and return on investment (ROI). Recommendation(s): To	-None of the interventions were solely aimed at improving nutrition and only two of them were solely aimed at increasing physical

<p>van Tulder, M.W.</p> <p><i>Obesity Reviews. International Association for the Study of Obesity; 12, 1031–1049. doi:10.1111/j.1467789X.2011.00925.x.</i></p>	<p>improving nutrition and/or increasing physical activity</p>				<p>increasing physical activity.</p>	<p>accurately measure ROI, there needs to be more emphasis on one specific intervention rather than multi-component interventions in order to evaluate the true effect. Study duration should be lengthened. And a more broad evaluation of metrics including turnover, presenteeism and injuries should be looked at.</p> <p>Finding(s): On average, the financial return in terms of absenteeism benefits, medical benefits or both were positive during the first years after implementation.</p>	<p>activity.</p> <ul style="list-style-type: none"> - Only the financial return in terms of absenteeism and/or medical benefits were compared between RCTs and NRSs. Other benefits such as reduced presenteeism, turnover, disability management and workers' compensation costs were not evaluated. - It is also important to mention that US employers bear a large part of the medical cost of their employees, whereas in Europe these accrue to the government or insurance companies. As a result, ROI analyses from the employer's perspective conducted in the U.S. and Europe are limited in their comparability.
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Academic Databases Searched

- 1. Medline:
 - Key Words
 - Worksite, obesity*: 144 total results
 - Reviewed: 18
 - Relevant: 6

Employee, obesity, financial: 4 results
Reviewed: 4
Relevant: 2

Employee wellness program: 148 results
Reviewed: 32
Relevant: 19

2. PubMed Central:

Key Words:
Workplace, Wellness, Obesity: 1779 results
Reviewed: 13
Relevant: 5

Workplace, Wellness, Financial, Obesity: 725 results
Reviewed: 6
Relevant: 1

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