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Health Promotion and Risk Factors: Developing a Roadmap for Prevention

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Introduction

The World Health Organization defines *health* as "a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity." It is the result of several factors, including behaviors, genetic predisposition to disease, the environment, and the community in which a person lives. The maintenance and promotion of health is achieved through different combinations of physical, mental, and social well-being.

Occupational health deals with all aspects of health and safety in the workplace and has a strong focus primarily on the prevention of hazards. It is important to understand that the overall health of workers has several determinants, including risk factors at the workplace leading to cancers, accidents, musculoskeletal diseases MSDs), respiratory diseases, hearing loss, circulatory diseases, stress-related disorders, obesity, communicable diseases, and others. Coupled with workplace risk factors are personal or individual risk factors such as lifestyle, diet habits, posture, work habits, and the person's current state of health, including chronic conditions.

Focus on Chronic Conditions

Current statistics reveal that more than 50 percent of adults have at least one chronic condition; this number is projected to increase steadily for the next 30 years.

Chronic conditions include illnesses such as cancer, heart disease, and diabetes. More than 7 out of 10 deaths each year are due to chronic diseases. In fact, more than 75 percent of healthcare dollars in the U.S. are spent on patients with one or more chronic, preventable conditions, with obesity leading the way.

Obesity Leads the Way

Obesity contributes to a variety of diseases, including heart disease, diabetes, and general poor health. Research demonstrates that work-related injuries are far more costly if the injured worker is obese. Also, higher medical care costs suggest that injuries sustained by obese workers are more likely to result in permanent disabilities.

A study published in the May/June 2007 issue of the *Journal of Health Promotion* looked at the rate of injury in overweight and obese adults in a cross-sectional study. The research analyzed data associated with

medically treated injuries of 42,304 overweight and obese individuals (as defined by having a body mass index (BMI) of more than 25). They found that overweight people were 15 percent more likely to have an injury, while obese people were 48 percent more likely. Types of injuries included sprains, strains, joint dislocations, falls, and fractures of the legs, ankles, and feet.

The incidence of obesity in the U.S. is the highest of all reporting countries and the trend continues unabated. Having a BMI in the overweight or obese range increases the risk of traumatic workplace injury, according to researchers at the Johns Hopkins Bloomberg School of Public Health's Center for Injury Research and Policy. The researchers used medical and injury surveillance data on hourly workers employed in eight plants of the same aluminum manufacturer to determine whether increased BMI was a risk factor for workplace injury.

Employees were grouped into five categories: underweight, normal, overweight, obesity levels I, II and III. Of the 7,690 workers included in the study, 29 percent were injured at least once during the 36-month period.

Employers Play a Key Role in Health Promotion

In addition to concerns over workplace injuries related to worker health and productivity factors, employers have an additional motivating factor to develop workplace health education and prevention programs: rising healthcare costs.

Recognizing that chronic illness accounts for more than 75 percent of healthcare spending, many employers are beginning to take a hands-on approach to developing employee health promotion and wellness programs. The most common workplace health programs in action address the issues of smoking, obesity, disease prevention, and disease management. Some companies provide incentives such as free gym memberships, a day off from work or financial rewards, the latter being the most popular among employees.

While financial incentives are prompting many employees to sign up for workplace wellness programs, a study by MetLife, the *8th Annual Employee Benefits Trends Study*, finds that nearly three-fourths of workers are motivated to participate because they want to be healthier. The study found that 37 percent of employers offered a wellness program in 2008 as part of their employee benefits package, which is up from 27 percent in 2005.

The Right Program Makes a Difference

Overall, some health promotion programs are more effective than others. Employers must understand the myriad underlying health concerns facing its population, and develop holistic programs that work in harmony with the company culture and demographics. The goals of health management are to:

- Develop health promotion programs
- Keep the healthy people healthy
- Provide resources
- Offer opportunities for healthy lifestyles
- Develop a culture to support the philosophy
- Avoid migration to unhealthy conditions

This paper focuses on providing a general state of the union from a health perspective; it defines the top six health concerns that employers cannot afford to ignore and offers a road map for program development.

State of the Union

The U.S. spends twice as much on health care per capita ($7,129) than any other country. More than 75 percent of all healthcare dollars are spent on patients with one or more chronic, preventable conditions, such as diabetes, obesity, heart disease, lung disease, high blood pressure, and cancer.

Obesity is one of the leading health problems that continue to worsen. In fact, more than 60 percent of the United States population is overweight or obese and, if the current trajectory continues, 50 percent of the population will be obese by 2030, according to The George Washington University School of Public Health and Health Services Department of Health Policy.

The Centers for Disease Control and Prevention (CDC) notes that four modifiable health risk behaviors are responsible for much of the illness, suffering and early death related to chronic diseases: (1) lack of physical activity, (2) poor nutrition, (3) tobacco use, and (4) excessive alcohol consumption.

The numbers are staggering. In 2011, more than 800,000 Americans died of heart disease; the annual direct and overall costs resulting from cardiovascular disease are estimated at $273 billion and $444 billion, respectively. Almost 600,000 Americans will die of cancer, a disease that last year cost $263.8 billion in direct and indirect costs. This statistic is not surprising when other numbers are taken into consideration:

- $78 billion per year is spent on care for heart disease.
- $1 out of every $10 spent on healthcare is spent on diabetes.
- Annual costs of short-term disability are $55 higher for overweight employees and $349 higher for obese employees versus healthy-weight employees.
- Obese employees are more likely to use sick days due to illness or injury.

Top 6 Health Concerns for Employers

1. Cardiovascular Disease

Cardiovascular disease (CVD or heart disease) is the leading cause of death in the U.S., and a major cause of disability. Cardiovascular diseases are those that affect the heart and circulatory system. The most widespread form of cardiovascular disease worldwide starts with damage to the blood vessels.

According to the International Diabetes and Cardiovascular Disease Federation, the two main processes by which the blood vessels become damaged are atherosclerosis and hypertension:

- *Atherosclerosis* leads to the formation of plaques of atheroma, fatty material that can build up within the arterial walls and narrow the diameter of the large and medium-sized arteries. This narrowing of the arteries impairs blood flow. Plaques are also prone to rupture or ulcerate, acting as a site for blood clot formation. The resulting blood clots, which can block the affected vessel completely, are usually responsible for the more severe clinical manifestations of cardiovascular disease, such as heart attack and stroke.
- *Hypertension* damages the smaller vessels in the circulatory system. Over time, they become scarred, hardened, narrowed, and less elastic. Hypertension can also predispose a person to, and accelerate the development of, atherosclerosis.

The major clinical manifestations of CVD can be divided into three groups:

1. Those affecting the heart and coronary circulation (*coronary heart disease*: any disease of the heart caused by coronary artery disease, although it usually refers to heart attack and angina)
2. Those affecting the brain and cerebral circulation (*cerebrovascular disease*)

3. Those affecting the lower limbs (*peripheral vascular disease*: peripheral vascular disease refers to diseases of blood vessels outside the heart and brain. It often involves a narrowing of the vessels that carry blood to leg muscles)

Risk Factors for CVD

A *risk factor* is something that increases the chances of getting a disease. Sometimes this risk is a result of lifestyle, behavior or genetics. Risk factors for CVD in the general population include the following:

- Age
- Sex
- Family history
- Smoking (1/5 of the annual 1,000,000 deaths from CVD are attributable to smoking)
- Poor diet
- High blood pressure
- High blood cholesterol levels
- Diabetes
- Obesity
- Physical inactivity
- High stress

Age. Simply getting older increases the risk of damaged and narrowed arteries and a weakened or thickened heart muscle, which contribute to heart disease.

Gender. Men are generally at greater risk of heart disease. However, the risk for women increases after menopause.

Family history. A family history of heart disease increases the risk of coronary artery disease, especially if a parent developed it at an early age (before age 55 for a male relative, such as a brother or father, and before age 65 for a female relative, such as a mother or sister).

Smoking. Nicotine constricts the blood vessels, and carbon monoxide can damage their inner lining, making them more susceptible to atherosclerosis. Heart attacks are more common in smokers than in nonsmokers.

Poor diet. A diet that is high in fat, salt, and cholesterol can contribute to the development of heart disease.

High blood pressure. Uncontrolled high blood pressure can result in the hardening and thickening of arteries, narrowing the vessels through which blood flows.

High blood cholesterol levels. High levels of cholesterol in the blood can increase the risk of formation of plaques and atherosclerosis. Plaques can be caused by a high level of low-density lipoproteins (LDLs), known as “bad” cholesterol, or a low level of high-density lipoproteins (HDLs), known as “good” cholesterol.

Diabetes. Diabetes increases the risk of heart disease. Both conditions share similar risk factors, such as obesity and high blood pressure.

Obesity. Excess weight typically worsens other risk factors.

Physical inactivity. Lack of exercise also is associated with many forms of heart disease and some of its other risk factors.

High stress. Unrelieved stress in a person's life may damage the arteries as well as worsen other risk factors for heart disease.

Poor hygiene. Not regularly washing hands and failure to establish other habits that can help prevent viral or bacterial infections can put a person at risk of heart infections, especially if there is an underlying heart condition already. Poor dental health also may contribute to heart disease.

It is important to emphasize that the presence of multiple cardiovascular risk factors has a multiplicative, not an additive, effect upon the incidence of coronary heart disease in the general population.

2. High Blood Pressure

High blood pressure (HBP) is a serious condition that can lead to coronary heart disease (also called *coronary artery disease*), heart failure, stroke, kidney failure, and other health problems. *Blood pressure* is the force of blood pushing against the walls of the arteries as the heart pumps blood. If this pressure rises and stays high over time, it can damage the body in many ways.

According to the National Heart, Lung and Blood Institute, about one in three adults in the United States have HBP. The condition itself usually has no symptoms; individuals may have it for years without knowing it. During this time, though, HBP can lead to heart failure, heart attack, aneurysm, peripheral artery disease or sudden cardiac arrest. Nearly 68 million adults have high blood pressure, and about half do not have this condition under control. Risk factors for developing high blood pressure include:

- Age
- Race
- Family history
- Overweight or obesity
- Inactivity
- Tobacco use
- Too much salt (sodium) in the diet
- Too little potassium in the diet
- Too little vitamin D in the diet
- Excess alcohol consumption
- Stress
- Certain chronic conditions

Why should employers bother with helping employees keep high blood pressure under control? The consequences are deadly:

- In 2010, the total costs of CVD in the U.S. were estimated to be $444 billion.
- Treatment for CVD accounts for about $1 of every $6 spent on healthcare in this country.
- More than one out of three (83 million) U.S. adults currently lives with one or more types of CVD.

The disease is responsible for:

- 35 percent of all heart attacks and strokes
- 49 percent of all episodes of heart failure
- 24 percent of all premature deaths

3. Overweight and Obesity

Overweight and *obesity* are both labels for ranges of weight that are greater than what is generally considered healthy for a given height. The terms also identify ranges of weight that increase the likelihood of certain diseases and other health problems.

For adults, overweight and obesity ranges are determined by using weight and height to calculate a number called the *body mass index* (BMI). BMI is used because, for most people, it correlates with their amount of body fat:

- An adult who has a BMI between 25 and 29.9 is considered overweight.
- An adult who has a BMI of 30 or higher is considered obese..
- The higher the BMI, the greater the risk for heart disease, high blood pressure, type 2 diabetes, gallstones, breathing problems, and certain cancers

A study on obesity found:

- 33.8 percent of U.S. adults are obese.
- 17 percent of children and adolescents aged 2–19 years are obese.

BMI is just one indicator of potential health risks associated with being overweight or obese. For assessing someone's likelihood of developing overweight or obesity-related diseases, the National Heart, Lung and Blood Institute guidelines recommend looking at two other predictors:

- The individual's waist circumference (because abdominal fat is a predictor of risk for obesity-related diseases)
- Other risk factors, such as diseases and conditions associated with obesity (for example, high blood pressure or physical inactivity)

Studies over the past three years show that American workers' expanding waistlines impact corporate bottom lines even more dramatically than previously thought, through increased healthcare costs, decreased productivity and chronic absence from work. Obesity is called a *gateway condition* because it can lead to heart disease, diabetes, and hypertension. Research findings support an association between body mass index and traumatic workplace injuries:

- In 2008, overall medical care costs related to obesity for U.S. adults were estimated to be as high as $147 billion.
- People who are obese had medical costs that were $1,429 higher than the cost for people of normal body weight.
- 29 percent of the employees sustained at least one injury. Approximately 85 percent of injured workers were classified as overweight or obese.
- The odds of injury in the highest obesity group, as compared with the ideal body mass index group, were 2.21 after adjustment for sex, age, education, smoking, physical demands of the job, plant process and location, time since hire, time on the job, and significant interaction terms.

Weight and BMI Health Consequences

- Coronary heart disease, stroke. and high blood pressure
- Type 2 diabetes
- Cancers, such as endometrial, breast, and colon cancer
- High total cholesterol or high levels of triglycerides
- Liver and gallbladder disease
- Sleep apnea and respiratory problems
- Degeneration of cartilage and underlying bone within a joint (osteoarthritis)
- Reproductive health complications, such as infertility
- Mental health conditions

Weight and BMI Risk Factors

Obesity occurs when one consumes more food and drink (calories) than one's body burns through exercise and normal daily activities. The body stores these extra calories as fat. Obesity usually results from a combination of causes and contributing factors:

- Supersizing
- Sedentary lifestyle
- Physical inactivity
- Poor diet
- Genetics
- Lack of breast feeding

Strategies for Prevention

- Safety personnel might consider adding policies or programs that address weight reduction and maintenance with the comprehensive workplace safety strategies
- Increase consumption of fruits and vegetables
- Increase physical activity (20-30 minutes of moderate aerobic activity—two or three ten-minute sessions are good as well)
- Increase breast-feeding initiation, duration, and exclusivity
- Eat fewer calories. Eat on the defensive
- Cultivate social support
- Commit to doing it, get a trigger
- Slow and steady wins the race
- Healthy emotional state before healthy body weight
- Decrease consumption of sugar drinks
- Decrease consumption of high-energy-dense foods, which are high in calories
- Do not buy bigger clothes

4. Diabetes

Diabetes is a chronic disease, marked by high levels of sugar (glucose) in the blood. Type 2 diabetes is the most common form of diabetes, affecting more than 23.6 million people. The disease is overwhelmingly caused by poor diet and lack of exercise. Symptoms may develop very slowly; one may not even know they have it.

Diabetes Risk Factors

- Overweight
- Inactivity
- People over age 45
- Family history of diabetes
- Low HDL cholesterol or high triglycerides, high blood pressure
- Racial and ethnic background
- Pre-diabetes

Double Jeopardy

Research shows that cardiovascular deaths are either high or appear to be increasing in countries where diabetes and obesity is prevalent:

- People with diabetes are two to four times more likely to develop cardiovascular disease than people without diabetes.
- CVD is the most common complication of diabetes.

Health Consequences

- Cataracts
- Damage to blood vessels that supply the legs and feet (peripheral vascular disease)
- Diabetic retinopathy (eye disease)
- Foot sores or ulcers, which can result in amputation
- Glaucoma
- High blood pressure
- High cholesterol
- Macular edema
- Kidney disease and kidney failure (diabetic nephropathy)
- Nerve damage, which causes pain and numbness in the feet, as well as a number of other problems with the stomach and intestines, heart and other body organs
- Stroke
- Worsening of eyesight or even blindness
- Impotence

Studies show that diabetes also significantly affects a company:

- $58 billion in reduced national productivity
- One out of every five healthcare dollars spent caring for someone with diabetes
- $116 billion in total medical expenditures, including drugs and office visits, as well as hospital costs
- More frequent and longer hospital stays, more doctor and emergency visits, more nursing facility stays, more home health visits and more prescription drug and medical supply use
- $18 billion for the estimated 6.3 million people with undiagnosed diabetes
- Largely preventable with proper diet and exercise

Diabetes Preventive Strategies

Preventing or delaying the onset of type 2 diabetes can be achieved through a healthy lifestyle, such as changing one's diet, increasing the level of physical activity, and maintaining a healthy weight. With these positive steps, individuals can stay healthier longer and reduce the risk of diabetes:

- Diabetes can be prevented or delayed.
- Those age 45 years or older should consider being tested for diabetes, especially if overweight.
- Eat a proper diet.
- Get exercise.

5. Cancer

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems. There are more than 100 different types of cancer. Most cancers are named for the organ or type of cell in which they start.

Cancer types can be grouped into broader categories. The main categories of cancer include:

- **Carcinoma**: Cancer that begins in the skin or in tissues that line or cover internal organs
- **Sarcoma:** Cancer that begins in bone, cartilage, fat, muscle, blood vessels or other connective or supportive tissue
- **Leukemia:** Cancer that starts in blood-forming tissue, such as the bone marrow, and causes large numbers of abnormal blood cells to be produced and enter the blood
- **Lymphoma and myeloma**: Cancers that begin in the cells of the immune system
- **Central nervous system cancers**: Cancers that begin in the tissues of the brain and spinal cord

Genes, lifestyle and the environment may increase or decrease the risk of getting cancer.

Most Common Types of Cancer

According to the National Cancer Institute the most common types of cancer are:

- Lung cancer
- Breast cancer
- Colon and rectal cancer
- Melanoma
- Non-Hodgkin lymphoma
- Bladder cancer
- Endometrial cancer
- Pancreatic cancer
- Kidney cancer
- Prostate cancer
- Leukemia
- Thyroid cancer

Risk Factors for Cancer

The risk of developing cancer increases as we age. Other factors include:

- Behavioral risks (smoking, diet, exercise, alcohol use)
- Biological risks (physical characteristics, race, age, gender)
- Genetic risks (heredity, family history)

Why should employers bother with providing cancer education and screening?

- Total costs of cancer: $228.1 billion
- $93.2 billion: Direct medical costs (total of all health expenditures)
- $18.8 billion: Indirect morbidity costs (cost of lost productivity due to illness)
- $116.1 billion: Indirect mortality costs (cost of lost productivity due to premature death)

Strategies for Preventing Cancer

- Don't use tobacco
- Eat a healthy diet with plenty of fruits and vegetables
- Maintain a healthy weight and include physical activity in your daily routine
- Protect yourself from the sun
- Take early detection seriously
- Have appropriate age- and sex-based screening
- Avoid risky behaviors
- Get immunized

6. Musculoskeletal Disorder

A musculoskeletal disorder (MSD) is a condition where a part of the musculoskeletal system is injured over time. MSDs occur when the body part is called on to work harder, stretch farther, impact more directly or otherwise function at a greater level then it is prepared to do. The immediate impact may be minute, but when it occurs repeatedly, the constant trauma causes damage. MSD pain affects the bones, muscles, ligaments, tendons and nerves. The problem maybe acute (having a rapid onset with severe symptoms) or chronic (long-lasting), and pain can be localized in one area, or widespread. The list of what can be defined as MSDs is extensive. Lower back pain is the most common type of MSD. Others include:

- Bursitis
- Carpal tunnel syndrome
- Computer vision syndrome
- Deep vein thrombosis

- Eye strain
- More repetitive stress
- Shin splints
- Swimmers shoulder/knee
- Tendinitis
- Tennis elbow
- Thoracic outlet syndrome
- Trigger finger
- Vibration syndromes

Risk Factors for MSDs

Risk factors for MSD development are both physical and psychological:

- Age
- Weight
- Gender
- Heredity
- Overall health
- Prior injury
- Mental health
- Hobbies
- Family
- Workplace factors, such as job satisfaction, relationship with management, physical demands, or co-workers

Why should employers be concerned with these health factors?

- Musculoskeletal disorders and diseases are the leading cause of disability in the U.S.
- MSDs account for more than one-half of all chronic conditions in people over 50 years of age in developed countries.
- More than one in four Americans has a musculoskeletal condition requiring medical attention.
- Annual direct and indirect costs for bone and joint health are $849 billion, 7.7 percent of the gross domestic product.
- MSDs cost employers $45 and $54 billion annually in compensation costs, lost wages, and lost productivity.
- MSD cases are more severe than the average nonfatal injury or illness (e.g., hearing loss, or occupational skin diseases, such as dermatitis, eczema, or rash).
- MSDs account for nearly 70 million physician office visits in the U.S. annually, and an estimated $130 million in total healthcare encounters, including outpatient, hospital, and emergency room visits.
- The BLS reported 26,794 carpal tunnel syndrome cases involving days away from work in 2001.
- In 2001, the BLS reported 372,683 back injury cases involving days away from work.

Strategies for Preventing MSDs

- Develop an ergonomic program
- Adjust individual behavior
- Balance between rest and activity

Roadmap for Prevention-Wellness Programs

There are multitude ways to approach wellness programs. The common success factors for prosperous programs include a commitment from management, worker involvement, adequate resources, and a policy concerning health that goes hand in hand with the company's mission, vision and values.

Tips for Launching a Program

- Create an environment beyond lunch-and-learns
- Evaluate cost drivers for employee health
- Assess to identify interest and motivation of employees, as well as barriers to participation
- Educate decision makers about the ways in which wellness programs can affect/reduce healthcare costs, as well as the benefits that can be achieved
- Obtain management support, which is critical to the program's success
- Identify goals and metrics for measuring success. A consensus must be established on the goals for determining success
- Integrate the program into the corporate culture
- Make it voluntary
- Make it an employee-spearheaded program, based on intervention targets and employee suggestions
- Build in incentive programs
- Include rewards for participation and milestones

The business community, in its role as employer, health care purchaser and respected community leader, is in a unique and powerful position to be a change agent. By collaborating with individual corporate leaders, evidence shows that wellness programs reinforce worksite health intervention strategies, establish performance incentives for population health, and improve business overall.

Conclusion

The overarching theme of this paper is that physical activity and weight control have the capacity to reduce the risk for disease. There are myriad other benefits from living an active, health lifestyle:

- Improve mental health and mood
- Strengthen bones and muscles
- Improve ability to perform daily activities
- Prevent injuries (falls, etc.)
- Increase chances of longer life

Health Management Goals Recap

- Keep the healthy people healthy
- Provide health promotion programs and resources
- Provide opportunities for healthy lifestyles
- Develop a culture to support the philosophy
- Avoid migration to unhealthy conditions

By focusing on improving the health and the quality of life for all working Americans and building cultures of well-being at the worksite, many diseases can be detected long before their symptoms are even noticed. This early detection is the key to staying healthy. As a result, a community of healthy employees thrives, controls costs, and drives productivity.

Benefits of Wellness Programs

- Improved health status
- Reduced sick leave and absenteeism
- Fewer injuries
- Decreased workers' compensation costs
- Increased productivity

- Planned/sensible use of medical benefits
- Lower turnover

Additionally, the incentives for a business to invest in the health of its workers also maintain indirect benefits as well. These initiatives create an image of corporate philanthropy, generate positive feelings of civic pride, and strengthen the employer's brand.

Furthermore, the development of a healthy workforce positively affects retention and performance levels. Ultimately, the market success of each corporation's future competitiveness and economic security depends on these approaches.

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