Title: Preventative Health Care

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Purpose: The purpose of this course is to provide an overview of preventative health care. The role of the patient as well as the health care provider will be discussed. A look at Healthy People 2010 will be utilized as a tool to evaluate goals that the nation is targeting. Interventions will be discussed to help the health care provider come away with practical tips.

Objectives

- Discuss the impact chronic disease has on the health of America
- List three risk factors for poor health
- Discuss the impact preventative health care has on reducing disease
- Discuss the role Healthy People 2010 has on helping America reach its goals for improving preventative health care
- Discuss the impact of lifestyle choices on preventative health
- Discuss the role of immunization on preventative health care
- State three interventions for each disease (osteoporosis, arthritis, cancer, diabetes, heart disease and sexually transmitted diseases) that describe good preventative health care

Introduction

Improved treatment and prevention of infectious disease and improved sanitation were two key factors contributing to the extended life expectancy that occurred from the early 1900’s to the early 2000’s. Improvement in the treatment and prevention of chronic disease is a critical factor if we are to see another
increase in life expectancy throughout the 21st century.

Preventative health care not only saves lives, but will save the health care system billions of dollars. Individuals who practice good preventative health care miss less work, are more productive at work, have a better quality of life and feel better.

Successful preventative health care involves effort by both patient and the health care system. Patients need to exercise, eat well, and not abuse toxic substances while the health care system needs to provide the resources such as performing screenings, providing advice and administering immunizations. When the two parties work together the nation as a whole will see less chronic disease and improved quality of life.

Chronic Disease

Each year over 1.7 million Americans die from chronic disease – this makes up a staggering 70% of deaths (1). Heart disease, cancer, stroke, chronic obstructive pulmonary disease (i.e. asthma, bronchitis, emphysema), and diabetes are five of the top six leading causes of death (2).

Chronic disease also negatively affects quality of life. It can cause physical disability, mental anguish or financial ruin. One of every ten Americans is burdened by major limitations secondary to a chronic disabling condition (1). The leading cause of disability is arthritis, but many conditions can lead to disability including chronic lung disease, heart disease, stroke or osteoporosis.

While genetics contributes to chronic disease, the best defensive against chronic disease is good preventative health care. When properly practiced,
preventative health care will reduce disease incidence, reduce medical costs and improve quality and quantity of life.

Specific chronic diseases will be looked at throughout this course. While specific measures to treat the disease will not be addressed, measures to prevent the onset of the disease will be.

Some risk factors are not modifiable, but many are. Non-modifiable risk factors include age, gender and family history. Physical inactivity, tobacco use, obesity, poor nutrition, and substance abuse are common risk factors that each individual has control over.

American society is greatly hampered by risk factors. Approximately 64% of the United States population is classified as overweight or obese (5). The World Health Organization reports that each year approximately 1.9 million people die from physical inactivity, 2.7 million die from not eating enough fruits and vegetables, 2.6 million die from being overweight and 4.9 million die from tobacco use (3).

**Preventative Health Care**

Preventative health care is a broad concept that entails multiple activities which prevents problems before they crop up or detects them before they do too much damage to the body. Diseases are more easily treated when caught early.

Preventative health care is underutilized in the United States. One reason is that health care providers may forget to recommend preventative testing. Individual health care consumers often do not help the cause; they may lack
proper education about the importance of preventative health care or what it
involves.

Ignorance about the positive aspects of preventative health care limits its use.
It is therefore important that health care providers and patients understand what
tests and what activities are needed and when they are needed. Patient and
provider lack of knowledge is another barrier to getting recommended health care
services. Exercise and nutrition are complex topics and many patients lack an
understanding of what makes up an exercise program or good nutrition.

Preventative health care is a joint effort between the health care provider and
patient. Health care providers are accountable for making suggestions, offering
counseling, performing screenings and sometimes recommending or prescribing
chemoprophylaxis. The health care consumer must live a healthy lifestyle and
stay away from unhealthy choices.

Prevention can be broken down into primary, secondary or tertiary. Primary
prevention eliminates or reduces risk factors before disease is present and
includes activities such as immunization and not starting smoking. Secondary
prevention detects disease early, when treatments are typically more effective.
For example, routine cervical Papanicolaou screening is one such measure.
Tertiary prevention involves activities that limit established disease.

Lifestyle interventions which will be discussed below in much more detail
entail a physically active lifestyle, good diet, maintaining a healthy weight and
avoiding toxic substances. These measures increase the chances of living a
long and healthy life.
Immunizations are the best measure to reduce the incidence of infectious disease. The use of widespread immunizations in childhood have virtually eliminated or at least significantly reduced some childhood diseases such as measles, mumps, rubella and poliomyelitis.

Preventable adult disease is not as well controlled with many cases of pneumonia and influenza occurring in unimmunized adults. While vaccination against these two conditions will not eradicate the diseases, it should appreciably diminish the impact of influenza and pneumonia. Healthy People 2010 (a set of health objectives for the Nation to achieve by 2010) has set a goal that 90% of high-risk adults over the age of 65 receive vaccination with the pneumococcal and influenza vaccine. In 2006, only 64% received vaccination with the influenza vaccine with in the last year and 57% ever received vaccination by the pneumococcal vaccine (4).

Screenings are tests done to detect common diseases. Screening tests help detect conditions early so interventions can have a strong impact on the outcome. Hypertension screening is a common test that is an example of screening. High blood pressure that is caught early can be treated and the risk of diseases such as heart disease, heart failure, stroke and kidney failure can be significantly mitigated. Cancer screening can reduce the risk of death in multiple types of cancer including: breast, cervical and colon cancer.

Counseling behaviors include a wide range of activities that the health care provider gives to the patient. They can include providing the patient with literature or teaching the patient about a specific topic. Smoking cessation,
physical activity, diet changes are common areas of counseling offered by health care providers. Counseling is critical in changing behaviors.

Primary care clinicians are typically responsible for counseling; unfortunately, they typically do not have time to do this job adequately. Multiple strategies can be used to help improve the ability of primary care clinicians to counsel patients.

- Brief teachings at multiple health care visits
- Bringing patients back for follow up health care appointments to focus on preventative health care
- Providing resources for patients to study at home
- Referring out to specialists (see table 1)

Understanding the resources available in the community is valuable. It is not possible to provide a complete educational module to a diabetic about nutrition in the primary care clinician’s or endocrinologist’s office. Knowing of a good dietitian – often within a diabetes education program - who can spend multiple sessions with the patient is a critical aspect to providing preventative health care to the diabetic patient.

In addition to diabetes education, it is important for health care providers to have knowledge of community resources to help with counseling. Many times experts in the community are better able to counsel patients without the pressures of a busy waiting room. The clinician should know a community professional for each situation listed in table 1. This allows the clinician to get the patient extra counseling and improve preventative health care.
Table 1: Resources for the primary care clinician to refer for preventative services

<table>
<thead>
<tr>
<th>Who</th>
<th>For what</th>
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<tbody>
<tr>
<td>Registered dietitian</td>
<td>Disease specific diets, weight loss</td>
</tr>
<tr>
<td>Exercise physiologist</td>
<td>Exercise programming</td>
</tr>
<tr>
<td>Social worker</td>
<td>A variety of social issues</td>
</tr>
<tr>
<td>Smoking cessation specialist</td>
<td>Smoking cessation</td>
</tr>
<tr>
<td>Psychologist</td>
<td>Counseling for mental health disease</td>
</tr>
<tr>
<td>Diabetes education program</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Cardiac rehabilitation program</td>
<td>Prevention of future cardiac events</td>
</tr>
<tr>
<td>Pulmonary rehabilitation program</td>
<td>Prevention of disability secondary to lung disease</td>
</tr>
<tr>
<td>Physical therapist</td>
<td>Restore function, enhance mobility, relieve pain, and prevent or reduce permanent physical disabilities</td>
</tr>
<tr>
<td>Occupational therapist</td>
<td>Evaluate, adapt, and alter everyday activities to enhance function, improve performance, prevent illness, promote health, and increase independence</td>
</tr>
</tbody>
</table>

One example where preventative health behaviors can make a huge impact is smoking cessation. Smoking is responsible for one in five deaths (6, 7). It
raises the risk of heart disease, chronic obstructive lung disease, lung and other (cervical, bladder, throat, esophagus, pancreas and kidney) cancers, stroke, hip, wrist and vertebral fracture, pneumonia and cataracts.

Stopping smoking has multiple benefits. Within several months, lung function increases and coughing and other respiratory symptoms are reduced. After one year of being smoke free the risk of heart disease is reduced by 50% and the threat for stroke is diminished after 5 years. After ten years, lung cancer death rate is almost half that of a current smoker. In 15 years, an ex-smoker's risk for heart disease is almost equal to a lifelong nonsmoker (7).

**Healthy People 2010**

Healthy People 2010 (HP2010) is a government program whose goal is to improve health care. It is a nationwide program, with 467 objectives, whose main purpose is to promote health and prevent disease.

The two major goals of HP2010 are to:

- Increase the life expectancy of Americans
- Reduce the health disparity of Americans

HP2010 was designed to improve the health of all Americans. The program looks to increase years of healthy life by improving care of chronic disease and improving care of those with mental and physical impairments. In addition, it looks to promote healthy behaviors through increasing physical activity, improving nutrition, reducing tobacco and substance abuse, reducing the number of unintentional injuries and improving sexual health. The program also looks to protect health by providing improvements in environmental and occupational
health. It also looks to improve treatment and prevention of infectious disease and improve food and drug safety.

Improving the quality of health care will improve the health of Americans. HP2010 has set goals to improve access to health and dental care. In addition, it has set goals to improve maternal, infant and child health care as well as family planning.

The community should also be strengthened as a part of improving health care and this can be accomplished by improving the public health infrastructure, providing education to the community and reducing the amount of abusive and violent behavior.

Leading health indicators – ten in total – are used by Healthy People 2010 to measure the Nation’s health. The leading health indicators are: access to health care, environmental quality, immunizations, injury and violence, mental health, overweight and obesity, physical activity, responsible sexual behavior, substance abuse and tobacco use (9).

**Risky Factors**

**Obesity**

Excessive body weight increases the risk of many disease states including: heart disease, stroke, hypertension, dyslipidemia, diabetes, osteoarthritis, gout, gallbladder disease, gastroesophageal reflux, erosive esophagitis and cancer of the esophagus, non-alcoholic fatty liver disease, sleep apnea, stress incontinence, depression and multiple cancers including; endometrial, breast, colon, rectal, pancreatic, kidney and esophageal (8, 10, 11). In addition to
disease states it reduces quality of life and increases the rates of functional impairment.

This is not a problem that is getting better. The rates of obesity currently stand at about 34%, which is up from 15 percent in the 1970’s (5).

Obesity costs America about 100 billion dollars annually and it makes up about 5.7 percent of the United States’ health care expenditures (10).

Obesity is often defined by using a tool called the body mass index (BMI). The BMI generally correlates with the amount of fat, but it is not the perfect system. It will underestimates the amount of fat in the person afflicted with muscle wasting and will overestimate the amount of fat in the patient with a large amount of muscle mass. For example, a lean muscular athlete may be classified as overweight using this system, whereas the deconditioned older adult who has a lot of body fat may be classified as normal weight when in fact they are overweight.

The BMI uses the patient’s height and weight to classify patients as underweight, normal body weight, overweight and obese. When the body mass index is more than 30 than the patient is classified as obese. Multiple online tools are available to easily determine BMI including an on-line calculators (http://www.nhlbisupport.com/bmi/bmicalc.htm) and on-line charts (http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm).
Table 2: Interpretation of Body Mass Index

<table>
<thead>
<tr>
<th>Less than 18.6</th>
<th>Underweight</th>
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<tbody>
<tr>
<td>18.6-24.9</td>
<td>Normal</td>
</tr>
<tr>
<td>25.2-29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>Over 30</td>
<td>Obese</td>
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The distribution of fat is another factor that helps classify obesity. Those who carry most of their fat in their abdomen are at greater risk of heart disease, hypertension and diabetes than someone who carries the fat in their legs, arms or hips (10). Abdominal adipose tissue is more biologically active; secretes inflammatory proteins; and is linked to plaque deposits in the coronary arteries (10).

Abdominal obesity is measured by looking at the circumference of the abdomen and comparing it to the hips. To determine the waist to hip ratio, the waist circumference is divided by the hip circumference. When the waist-to-hip ratio is greater than 0.9 in men or 0.8 in women than the patient is at increased risk for obesity related complications.

Causes of Obesity

Putting more energy in the body than one expends will result in a weight gain as the body stores that extra energy as fat. Both the energy in and energy expended can be controlled to some extent. Energy intake is controlled by how many calories one consumes. Energy out is determined by a multitude of factors
including: genetics, age, gender, amount of muscle mass, activity level, temperature and existing disease states.

One pound of energy is equivalent to 3500 calories. When an excess of 3500 calories are consumed than the result is a net gain of one pound. For example, a patient whose weight has been stable over one year and then starts drinking a can of soda every night which is equivalent to 100 calories, than, in 35 days, that patient would weigh one pound more (assuming everything else in this patient’s diet and activity level remained stable).

Many factors contribute to the increased incidence of obesity: long-work schedules, inactive lifestyles, large portion sizes available at restaurants, availability of high calorie snack food and the abundance of fast food restaurants. Like most things in health, genetics contributes to weight gain and obesity rates. Dopamine in the brain helps control eating patterns and is genetically lower in some people (11). Genetics may help determine if one is going to store fat in the abdomen or in the legs and gluteal area.

Lifestyle habits are shared by family member. Children often adopt poor or good lifestyle choices of their parents. Households that have healthy food such as an abundance of fruits and vegetables and have small amounts of processed, high-fat, high-calorie food, generally, have members who eat healthier.

Medical problems and medications are linked to body weight. Sleep deprivation, depression, hypothyroidism, Cushing’s disease and polycystic ovarian disease may contribute to obesity (10). Medications responsible for
weight gain include: antidepressants, antipsychotics, lithium, insulin, sulfonylureas and corticosteroids

**Treatment Options**

Treatment should be initiated when the BMI is above 25 and there are two or more risk factors (large waist circumference, high blood pressure, dyslipidemia, family history of diabetes or heart disease). When BMI is greater than 30, treatment should be started. Nonetheless, all people should be encouraged to live a healthy lifestyle and be persuaded to exercise and eat healthfully.

Weight loss should be gradual with a goal of losing one to two pounds a week. Treatment plans should be variable with goals set on an individual basis while considering motivation, financial resources and medical co-morbidities.

**Physical Activity and Fitness**

Physical inactivity is a major contributor to preventable death and disability. Those who are regularly physically active reduce their risk for heart attack, stroke, diabetes type 2, dyslipidemia, hypertension, and osteoporosis (12, 13). Physical inactivity accounts for over 1.9 million deaths across the globe (3). In addition, to reducing the risk of death, exercise improves quality of life.

A well balanced exercise program incorporates aerobic exercise, strength training, and stretching. Aerobic exercise endows benefits to the heart, lungs and circulation. These benefits result in prevention and treatment of many disease states. Bone and muscle strength is enhanced with strength training. Stretching maintains muscle flexibility and reduces the risk of injury.

Aerobic exercise assists in the management of hypertension, dyslipidemia,
improves the clotting parameters of the blood and reduces strain on the heart (12, 13, 14). Exercise lowers risk for cardiovascular disease; specifically, it lowers the risk of myocardial infarction, stroke and peripheral vascular disease.

Exercise improves mood; it may help prevent and even treat anxiety and depression (12). In addition, exercise improves sleep.

Aerobic exercise, which uses large muscle groups to increase heart and respiratory rate, increases endurance and functional ability. Examples of aerobic exercise include walking, biking, jogging, swimming and aerobic exercise classes.

Strength training increases muscle mass, improves functioning, burns fat and strengthens bones. Strength training can be accomplished with free weights, machine weights and using the weight of the body to build strength.

Stretching has many benefits. Flexibility is the capacity to move the limbs through a range of motion. Poor flexibility increases the threat of injury, particularly low back injuries. In addition, flexibility training provides a feeling of well-being and relaxation.

Unfortunately, many people have limited leisure time and physical activity gets pushed to the back burner. In 2006, 39% of those over the age of 18 did not engage in physical activity. The goal for HP2010 is that only 20% of the population does not engage in physical activity. Those who engage in regular physical activity either of moderate or vigorous activity was 31% in 2006 which is 19% below the 50% goal set by 2010 (4).

Lifelong fitness is a desirable goal. Incorporating physical activity into the
lives of children and adolescents is one way to ingrain habits to make it a lifelong habit. In 2004, 27% of high school students engaged in moderate physical activity and 64% engaged in vigorous physical activity (4).

Physical education is another way to teach patients about the importance of physical activity and ingrain those habits into children and adolescents. Unfortunately, it is becoming less common to require physical education in school. In 2006, 7.9% of middle schools and 2.1% of high schools require physical education. Thirty-three percent of high school students participated in daily physical education (4).

Statistics for resistance training exercise are even bleaker. In 2006, only 19% of adults regularly engaged in resistance training. The goal of HP2010 is 30% (4).

The third component to a balanced exercise program is flexibility training which was employed by 30% of adults in 1998. The HP2010 goal is 43% (4).

**Risk of Exercise**

Exercise can be risky. Those at high risk should be evaluated with a complete physical exam and some patients are candidates for an exercise stress test. Some restrictions may be placed on certain exercisers. Those with unstable medical conditions may require stabilization prior to initiating an exercise program. Despite the risk, the overall risk to health is greatest for those who do not exercise.

Soreness is a component of exercise, but it should not be extreme. Some
soreness for the first few days after an exercise session is normal – especially in the beginning. Precautions should be taken to minimize soreness. Less active individuals should initiate an exercise program slowly. The use of certified exercise professional to direct the novice exerciser is helpful to assure exercise is safe, enjoyable and minimizes the risk of injury.

**Chronic Diseases**

Chronic disease is not an obstacle to starting an exercise program. Diabetes, heart disease, hypertension, dyslipidemia, osteoporosis, can all be treated, at least somewhat, with exercise. Precautions may need to be applied such as having an exercise stress test or exercising under the watchful eye of an exercise professional.

Certain conditions warrant extra caution. When chronic diseases are uncontrolled or there is the presence of a new onset acute illness, exercise should be avoided. Specific conditions that warrant placing a hold on exercise-at least until an evaluation by a physician - include: chest pain; irregular or fast heart beat; fever; severe shortness of breath; significant, ongoing weight loss; blood clot; infection; hernia; dehydration; new joint swelling or pain; abdominal aortic aneurysm or cardiac valve pathology (13).

**Exercise Prescription**

Exercise prescription- which should be individualized - is a formula to explain how one should exercise. Each mode of exercise, including aerobic exercise, strength training and stretching has a particular exercise prescription.

**Aerobic Exercise**
Aerobic exercise prescription is broken down into frequency, intensity, time and type. Those starting an exercise program have a different prescription than someone who has been exercising for years. Easing into an exercise program is important to reduce the risk of soreness and injury.

**Frequency**

Ideally, aerobic exercise should be carried out three to seven times per week. Performing some type of aerobic exercise three times a week with one day rest between exercise sessions is a sensible starting goal. After two to four weeks increasing the frequency to 4 days a week is prudent. Adding one day a week every month assures the body acclimatizes to the exercise without causing excessive soreness, injury or psychological burnout.

Optimal health is accomplished with regular exercise. Working up to some form of aerobic exercise or physical activity everyday is a goal that will maximize health.

**Intensity**

Health benefits are maximized and risks minimized with moderate exercise (13). Vigorous exercise increases the risk of burnout, injury and non-compliance.

A method to gauge the intensity of exercise is to use the talk test. Moderate intensity is defined by increased breathing during exercise but a conversation can be maintained without gasping for air.

The heart rate method is another way to determine intensity. While more complex methods exist, typically, a percentage of the predicted maximal heart
rate is utilized to determine the ideal training range. The predicted maximal heart rate is determined by subtracting the patient’s age from 220. For example, a 40 year old would have a (theoretical) maximal heart rate of 220-40 or 180 beats a minute.

Individual variation in maximal heart rate is common - not every 40 year old has a maximal heart rate of 180. Certain medication can greatly affect the maximal heart rate. For example, beta-blockers and some calcium channel blockers - decrease not only blood pressure but heart rate. These medications reduce the maximal heart rate and formulas to calculate maximal heart rates are therefore erroneous.

A maximal exercise stress test- which establishes a true maximal heart rate – can assist with calculating a heart rate training zone. Most patients do not have a stress test prior to exercise and therefore this is not practical. The use of a heart rate monitor is extremely helpful for those who want to use the heart rate method for determining the proper training zone.

**Duration**

The initial level of fitness must be taken into account when determining duration. Those who are extremely inactive would not be able to tolerate long exercise durations and would be better served by keeping exercise durations minimal. Increasing the duration with each exercise session – even by as little as 30-60 seconds is one method of increasing fitness. It is not unreasonable to start off exercising 10 to 20 minutes per day and building up to 30 minutes per session.
Type

Ideal aerobic exercise uses large muscle groups like the legs with exercises such as walking, biking, exercise classes and swimming. Personal preference needs to be taken into account when deciding which exercise to recommend - exercises that are enjoyed will be complied with better. Often times the best exercise is a variety of exercises, known as cross training.

Cross training may help alleviate boredom by incorporating different exercises. In addition, it stresses different muscle groups and joints instead of those who perform only one exercise. Cross training involves doing different exercise at different times. Doing a different exercise at each exercise session such as: walking on the treadmill on Monday; and than on Wednesday doing a water aerobic class; and Friday riding the stationary bike for 30 minutes is one way to do aerobic training. Another way to cross train is to do different exercises at each training session. For example, ten minutes on the stationary bike, ten minutes on the elliptical trainer and 15 minutes walking on the track is another way to cross train.

Strength Training

Strength training increases strength, tone and improves the ability to function. It is also effective in treating and preventing certain diseases.

Safety is an important consideration when developing a strength training program. When selecting a weight it is important to start off low and work up gradually. Weight lifters should never hold their breath as this has the potential to increase blood pressure. Breath out with each exertion and breath in with the
easier part of the lift is one method to assure there is no breath holding. Warming up before and cooling down after exercise should also be incorporated.

Strength training prescription is different and more complex – especially with intensity - than aerobic prescription. While some athletes and body builders may lift weights on a daily basis this is not necessary for the person trying to gain health benefits from exercise. For this patient, strength training should be carried out 2-3 times per week with at least 48 hours rest between each session. With out at least 2 days rest between weight lifting session the muscles may be overworked and will not recuperate adequately. Each weight training session should last 15-45 minutes and consist of at least one exercise for each main muscle group of the body (table 4).

There is no specific weight or formula to help gauge intensity in weight training. Determining the proper weight often requires trial and error. A trained exercise specialist may be extremely helpful for the novice exerciser to help them pick an appropriate weight and assure that they are lifting safely. When starting, it is wise to choose a weight that is light and the focus should be placed on performing the exercise with proper form. The goal is to eventually select a weight that offers enough challenge so the last repetition in a set is the last repetition that can be done without compromising form.

Progressive overload involves increasing the amount of work done in subsequent exercise sessions. Progressive overload pertains to the amount of weight on the exercise bar, the number of sets or the number of repetitions performed. Progressive overload forces the muscle to increase strength. It is
important to assure that form is never compromised in order to overload the muscle.

A weight that permits 8-15 repetitions should be selected, which is the ideal range for those who want maximized health benefits. Using heavier weights and fewer repetitions is beneficial in increasing the strength and power but will increase the risk of injury.

One to two exercises for each major muscle group is a good strategy for improvement in strength and improvement in health. Performing at least one exercise per major muscle group is recommended (see table 4).

When initiating a weight training program encourage patients to select lower weights, lower repetitions, and fewer sets with the goal of increasing weight, repetitions and sets as strength permits. This tactic reduces injury rates and decreases muscle soreness. Starting out with one set per exercise and working up to three sets is a reasonable goal.

**Key points to strength training (adapted from 16)**

- **Start low, go slow**
- **Warm up before and cool down after each weight training session**
- **Perform movements slow and under control**
- **Exercise 2-3 times a week**
- **Exercise each major muscle group**
- **Start with one set per exercise**
- **Work up to two to three sets per exercise**
- **Take at least 48 hours rest between weight lifting sessions**
- Choose a weight you can perform 8-15 times
- Incorporate progressive overload

### Table 3: Example of Progressive overload (used with permission from 16)

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest press</td>
<td>50 lbs./10 times – one set</td>
<td>50 lbs./11 times – one set</td>
<td>50 lbs./11 times – two sets</td>
<td>50 lbs./11 times – two sets</td>
<td>50 lbs./12 times – two sets</td>
</tr>
<tr>
<td>Leg press</td>
<td>90 lbs/12 times – one set</td>
<td>90 lbs/13 times – one set</td>
<td>90 lbs/14 times – one set</td>
<td>90 lbs/15 times- one set</td>
<td>100 lbs/12 times – one set</td>
</tr>
<tr>
<td>Arm Curl</td>
<td>20 lbs/15 times – one set</td>
<td>20 lbs/15 times – two sets</td>
<td>25 pounds/10 times – two sets</td>
<td>25 pounds/11 times/ two sets</td>
<td>25 pounds/11 times for two sets and 10 times for one set</td>
</tr>
</tbody>
</table>

**Stretching**

Each major muscles group should be stretched with each stretch being maintained at a point of minimal discomfort. Stretches should not be aggressive because this raises the risk of injury and should be held for 10-30 seconds. The
length of the stretch is more essential than the duration of the stretch to improve flexibility and reduce the risk of injury (16).

It is ideal to stretch a warm muscle. Warming a muscle is accomplished by completing at least ten minutes of aerobic exercise (such as walking) before stretching. Muscles are like a piece of gum. A cold piece of gum, when bent, will snap. Conversely, a warm piece of gum will bend nicely. The muscle can be thought of as a piece of gum and warm them up before stretching (16).

Table 4: Major Muscle Groups

| • Back          |
| • Chest         |
| • Abdominal     |
| • Quadriceps    |
| • Lower Back    |
| • Shoulders     |
| • Hamstring     |
| • Bicep         |
| • Triceps       |
| • Calves        |

Substance abuse

Alcoholism is one of the most common forms of substance abuse with a lifetime prevalence of 12-16 percent (17). Alcohol in moderation can have beneficial effects on health. Excessive use of alcohol has negative effects on the
body including liver damage, gastrointestinal problems, hypertension, mood disturbances, erectile dysfunction and problems with balance which leads to falls and fractures. Deaths related to cirrhosis were 9.6 per 100,000 people (4).

Moderate alcohol consumption - defined as one drink per day for women and two drinks per day for men - may protect the heart and raise HDL cholesterol (18). Excessive alcohol consumption raises the risk of hypertension, breast cancer, alcoholism, stroke, suicide, obesity and accidents (19). Excessive alcohol use is associated with poor decision making and involvement in high risk activities such as fighting, reckless driving and unsafe sexual contact. Alcohol related deaths are a major problem in American society. In 1998, 5.3 deaths per 100,000 people were related to an alcohol-related motor vehicle accident (4).

The rate of alcohol abuse is higher among American Indian and Alaska Natives with rates in 1999 of 24.8 per 100,000 people. Since 1999, there has not been significant reduction. In 2005 the rate is 9.0 and 22.6 per 100,000 people for the over all population and American Indians/Alaska Natives, respectively (4).

**Tobacco Use**

Cigarette smoking is the most common form of tobacco use. In 1998, 24% of those over age 18 smoked. In 2006, the number dropped to 21%, well short of the 12% target desired by HP2010. In 1998, forty percent of high-school students used tobacco – with cigarettes being the most commonly used form of tobacco - in the last year, but this number decreased to 28% in 2005 (4).

Cigarette smoking has multiple deleterious effects on health. It increases the risk of cardiovascular disease. Those who smoke are more likely to be affected
by myocardial infarctions, peripheral artery disease and stroke. It also increases the risk of multiple types of cancer including: lung, oral, esophagus, larynx, throat, bladder, pancreas, kidney, cervix and stomach (20). In addition to lung cancer, smoking negatively affects the lungs in multiple ways. Smokers are at increased risk for chronic bronchitis and emphysema.

The best way to reduce the impact smoking has on the health of the nation is to decrease the number of people who smoke. Stopping people from ever smoking is ideal, but there are many current smokers. For those who are current smokers quitting is critical. Between 1998 and 2006, 41-43% of adult smokers attempted to quit smoking. HP2010 wants 75 percent of smokers to attempt stopping smoking (4).

Exposure to second-hand cigarette smoke is another common problem. For those under the age of 6, 20% were exposed to second-hand smoke. This number significantly decreased to 8% in 2004.

The impact smokeless tobacco has on health is not as severe, possibly because in 1998 only 2.5 % of adults use it, but it has serious negative consequences (4). Smokeless tobacco includes dip, snuff and chew. Smokeless tobacco is associated with oral cancer, pancreatic cancer, leukoplakia, bad breath, wearing down of the teeth, staining of the teeth and bone loss around the roots of the teeth (21).

**Infectious Disease**

Immunizations, clean water and improved sanitation are the greatest success stories of American public health in the 20\textsuperscript{th} century (22).
In the United States, immunizations have lead to the near elimination of numerous infectious diseases including: measles, mumps, rubella, diphtheria, pertussis, and Haemophilus influenzae type b.

There remains opportunity for improvement. For example, in adults in the United States, there are an estimated 36,000 deaths and 200,000 hospitalizations each year from influenza (23). Among targeted adult groups, only 42.2 percent of adults age 50-64 and 68.8 percent of adults over age 65 get the influenza immunization (24). While immunization will not completely eradicate infectious disease, they have the potential to reduce the incidence and their impact.

Health care providers are key players in preventing the vaccine-preventable illnesses by assuring each patient is fully immunized. Many factors lead to immunization failure including: patient non-compliance, failure of vaccines, missed opportunities to immunize, provider confusion among immunization practices and frequent changes in immunization schedules.

Current Immunization Update for 2008

The updated immunization schedule for 2008 is available on-line through the Center for Disease Control at: http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm#printable. Please review the following links to the CDC website for a complete listing of vaccine schedules:

- Children 0-6:
  
Specific Disease and preventative medicine

Arthritis

Osteoarthritis (OA) is a common source of disability. The Arthritis Foundation approximates that in 2005, 66 million or almost one in three adults are affected by arthritis or chronic joint symptoms and it costs the American economy 86.2 billion dollars each year (25). Effective management of arthritis improves mobility, decreases falls, decreases death rates and improves quality of life. Prevention of this disease could have an enormous impact on the effect arthritis has on individuals as well as the health care system.

Osteoarthritis is a joint disease with deterioration of the joint and abnormal bone formation. When the cartilage, which typically cushions the bones, no longer does its job OA is present. The ends of the bones rub together and the cartilage erodes.
Two common forms of arthritis are osteoarthritis and rheumatoid arthritis. Osteoarthritis is more common in those over 50. Rheumatoid arthritis, a chronic destructive, sometimes deforming disease, attacks the collagen in the body especially in the joints. Rheumatoid arthritis is associated with widespread symptoms such as fatigue, fever, poor appetite, neuropathy, splenomegaly and lymphadenopathy. Other diseases that affect the joints include gout, lupus, scleroderma and fibromyalgia.

Prevention of OA is a challenge. Avoiding risk factors is a key component to preventing the disease. Patients should maintain a healthy weight throughout life. This may be the most important factor to reduce the risk of OA. As extra body weight increases the stress on weight bearing joints exponentially. Regular physical activity will help maintain the muscles and joints and should reduce the risk of OA. Avoid activities that are associated with a lot of trauma such as contact sports or a lot of repetitive movement such as long distance running. Injury prevention decreases the risk of present and future cartilage damage.

**Osteoporosis**

Osteoporosis is a silent disease that thins bones, causing them to be more porous and more prone to fracture. It afflicts 10 million Americans over the age of 50 and 34 million are afflicted with osteopenia (26). It costs the American health care system 17 billion dollars annually.

Osteopenia is present when a bone mineral density is less than normal, but not low enough to be classified as osteoporosis. Those with osteopenia are at greater risk for the development of osteoporosis.
Fracture is a primary complication of osteoporosis. Other complications extend from the immobility secondary to fracture, which, most frequently involve the backbone, hip and wrist. Diabetes, heart disease and stroke are three common diseases that result from prolonged immobility or reduced physical activity. In addition, fracture can lead to nursing home placement. After an osteoporotic fracture some patients lose the ability to walk independently, while others require the use of walking aids such as a cane or walker.

Vertebral fractures can lead to chronic back pain, kyhosis, height loss and death. The risk of constipation, weight loss and abdominal pain is heightened with lumbar fractures and thoracic fractures are linked to restrictive lung disease.

Peak bone mass – which usually occurs between the ages of 25 and 30 - depends on multiple factors. It is important to identify risk factors so patients may be counseled to reduce the risk of the disease.

The greatest risk factor is age – typically the sixth decade sees the greatest bone loss. Multiple factors are typically associated with osteoporosis including genetics, hormonal imbalance, poor nutrition and decreased physical activity.
<table>
<thead>
<tr>
<th>Risk Factors for Osteoporosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Personal history of fracture after age 50</td>
</tr>
<tr>
<td>- Female gender</td>
</tr>
<tr>
<td>- Family history of fracture</td>
</tr>
<tr>
<td>- Physical inactivity</td>
</tr>
<tr>
<td>- Low lifetime intake of calcium and/or vitamin D</td>
</tr>
<tr>
<td>- Increased age and post-menopausal status</td>
</tr>
<tr>
<td>- Excessive phosphorus/protein in the diet</td>
</tr>
<tr>
<td>- Cigarette smoking</td>
</tr>
<tr>
<td>- Low body weight</td>
</tr>
<tr>
<td>- Diseases such as multiple myeloma, inflammatory bowel disease, depression and stroke</td>
</tr>
<tr>
<td>- Ammenorrhea</td>
</tr>
<tr>
<td>- History of eating disorders</td>
</tr>
<tr>
<td>- A family history of osteoporosis</td>
</tr>
<tr>
<td>- Alcohol abuse</td>
</tr>
<tr>
<td>- Caucasian or Asian race</td>
</tr>
<tr>
<td>- Medications such as glucocorticoid steroids, proton pump inhibitors, excessive thyroid hormones, lithium, long-term heparin, certain anticonvulsants, some diuretics (furosemide [lasix]) and certain immunosuppressants.</td>
</tr>
</tbody>
</table>
Screening for osteoporosis should be performed on all women over 65 and women 60 and older at increased risk for an osteoporotic fracture (27). The best method to screen for osteoporosis is the duel-energy x-ray absorptiometry (DEXA) scan which measures bone mineral density. Those afflicted with osteoporosis on screening should be treated with alendronate, risedronate or raloxifene (28).

**Prevention**

Reducing risk factors for osteoporosis as much as possible is the key to prevention. There are many lifestyle choices that reduce the risk of osteoporosis as well as treating the disease.

Diet is key in the prevention and treatment of osteoporosis. Calcium and vitamin D are vital nutrients for those with or at risk for thin bones. Many do not consume these nutrients in adequate levels and therefore supplementation is often needed. Few foods have significant quantities of vitamin D so getting enough vitamin D through the diet is challenging for most. Sun exposure - about 10 minutes of exposure of the hands, arms, and face, three to four times per week –is one method the body can obtain vitamin D. Obtaining 1200 to 1500 mg of calcium and 400-800 IU of vitamin D is recommended.

Exercise is another strategy used in the treatment and prevention of osteoporosis. Weight bearing exercises (for example, walking or jogging) are ideal for building/maintaining bone.

Weight training is another important mode of exercise in osteoporosis prevention and treatment. The stresses placed by weight training help maintain
and build the bones. Upper body weight training exercises help the bones of the upper extremity, which are not typically addressed in most aerobic exercise training programs.

By the age of 25-30 most women have attained their peak bone mass so dietary and exercise efforts are critical during childhood, adolescents and early adulthood to maximize peak bone density. Those who have attained a large skeletal mass peak, will take longer to deplete it and may hasten the onset of osteoporosis/osteopenia.

Key steps in the prevention of osteoporosis are to encourage patients to:

- Participate in weight bearing exercise and weight training
- Eat foods high in calcium and vitamin D
- Do not smoke
- Do not use alcohol excessively
- Bone density testing and medication when appropriate

Table 6: Foods with calcium and Vitamin D (adapted from 16)

<table>
<thead>
<tr>
<th>Foods high in calcium</th>
<th>Foods High in vitamin D</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Milk</td>
<td>➢ Milk (Vitamin D fortified)</td>
</tr>
<tr>
<td>➢ Ice Cream</td>
<td>➢ Cereal (Vitamin D fortified)</td>
</tr>
<tr>
<td>➢ Yogurt</td>
<td>➢ Egg Yolks</td>
</tr>
<tr>
<td>➢ Cheese</td>
<td>➢ Liver</td>
</tr>
<tr>
<td></td>
<td>➢ Salt water fish</td>
</tr>
</tbody>
</table>
Cancer

Cancer is the second leading cause of death in those over the age of 50. There are many different types of cancer that can affect many different body systems. In 2005, 183.8 per 100,000 people died of cancer. Healthy People 2010 hopes to reduce this number by improved screening, improving treatment and risk factor reduction. The goal from cancer deaths is set at 158.6 per 100,000 people for 2010 (4).

Preventative health care will reduce death rates from cancer. Not smoking or stopping smoking is the most important measure to prevent cancer. Smoking is linking to multiple cancers including: lung, oral, throat, pancreatic, stomach and cervical (7). In 1988 the percentage of family practitioner and internal medicine physicians who counseled patients about smoking cessation was 43 and 50 percent, respectively. In 1997, 59% of dentists counseled patients about smoking cessation (4).

The risk of skin cancer can be minimized with the restriction of exposure to ultraviolet light. This is accomplished by avoiding sun exposure during peak times (between 10 am and 3 pm). Reduce sun exposure to the skin by wearing clothing that covers up the majority of the body such as long pants, long sleeve shirts and a wide brimmed hat. The utilization of sunscreens on exposed areas should also be employed.

HP 2010 has a goal of reducing the sun exposure, but it is impractical to suggest complete avoidance of the sun. When it is necessary to go out in the sun then the use of protective measures outlined above should be utilized.
HP2010 wants 85% of people to use protective measures against the sun. In 2000, the number of people who did was 59% and the in 2005 the percentage increased to 71% (4).

Regular exercise and avoiding obesity reduces the risk of breast and colon cancer. The current state of medical science does not allow for universal recommendations for how a specific diet or certain foods will reduce the risk of cancer. Experts have developed a series of recommendations for reducing the risk of cancer, not eliminating the risk (5).

Occupational exposure to many substances including - asbestos, radiation and benzene - increases the risk of cancer. Those who work in the rubber and dye industry are at increased risk for bladder cancer. Brain and bone cancer risk is increased in those exposed to ionizing radiation. Asbestos increases the risk of certain types of cancer including: laryngeal cancer and lung cancer. Leukemia is associated with exposure to ionizing radiation and benzene. Lung cancer has multiple occupational agents that increase the risk of that type of cancer. Some agents suggestive of lung cancer include: asbestos, aluminum production, arsenic, beryllium, cadmium, chromium, ionizing radiation, iron and steel founding, painters, radon, silica, and talc (17, 29).

Early detection of cancer reduces the risk of death from many cancers including cancer of the breast, cervix and colon. Breast cancer screening should occur by regular mammography with or without regular breast exam every 1-2 years for women after the age of 40 (30). This data is most robust for women between 50-69 years old.
The regular use of clinical breast exams without mammography is not recommended as a screening tool for breast cancer. There is not sufficient data to recommend for or against the use of breast self-exams in women (30).

The use of chemoprophylaxis is one approach in the prevention of breast cancer. The U.S. Preventive Services Task Force (USPSTF) has made recommendations based on risk. Those women who are of low or average risk should not use tamoxifen or raloxifene for primary prevention of breast cancer as the risks likely outweigh the potential benefits in individuals with low to average risk (31). Individuals with high risk for breast cancer and low risk of adverse effects of medication should be considered for tamoxifen or raloxifene use. The evidence for tamoxifen is better than the evidence for raloxifene (31). The benefit is seen in the reduction of invasive estrogen-receptor positive breast cancer. Both medications are linked to an increase risk stoke, deep vein thrombosis and pulmonary embolism. Tamoxifen increases the risk of endometrial cancer.

Americans are doing fairly well as far as obtaining screening for breast cancer. Sixty-seven percent of women over 40 have had a mammogram in the last two years in the years of 1998 to 2005. The goal set by HP2010 is 70% (4).

Cervical cancer is screened for by a Papanicolaou test. It should begin after the age of 21 or within three years after the first sexual encounter (32). Seventy-eight percent of eligible adults received screening in 2005, falling just short of HP2010’s goal of 90% (4).

There is controversy on whether or not screening should continue after age 65. Those who have had normal previous screening may not benefit from continued
screening as the possibility of finding disease is small (32). There may be more harm than good from continued screening.

At the age of 50 colon cancer screening should begin, although some high risk individuals should be screened sooner. The most basic screening test is checking the stool for occult blood in three samples. Sigmoidoscopy and colonoscopy can also be used (33). The sigmoidoscopy should be done every five years and the colonoscopy every ten.

The use of colon cancer screening will hopefully detect cancer early and reduce death rates. HP2010 wants the rate of colorectal cancer deaths to be 13.7 per 100,000 people while the rate was 17.5 in 2005 (4).

Rates of screening for colon cancer are low; only 24 percent of those over 50 had screening with a home test in 2000 and that number dropped to 17% in 2005. The goal set by HP2010 is 33% (4).

Screening for prostate cancer is controversial. The use of a digital rectal exam and a blood test for prostate-specific antigen (PSA) is often used as a screening tool for prostate cancer. The USPSTF suggests that there is not enough evidence to make recommendations for or against regular prostate cancer screening with either method (34).

Lung cancer screening is not recommended as the risk of the test and the rates of false positive tests are greater than the few true positive tests that will be detected by screening. Those individuals without symptoms should not be screened by either spiral CT or chest x-ray for lung cancer (35). The Task force goes on to suggest that other factors may sway the clinician into testing some
Like many diseases diet is strongly related to cancer prevention. The Harvard School of Public Health (36) recommends eating a diet high in fruits and vegetables. Vegetables such as lettuce, broccoli, cabbage, garlic, onions and other leafy green vegetables likely protect against specific types of cancer such as oral, esophagus, stomach, and throat cancer (37). They also recognize that fruits probably protect against lung cancer. There is some evidence that
lycopenes may reduce the risk of prostate cancer (36).

Many other dietary choices may help in the reduction of cancer. A diet high in fiber including fruits and vegetables, whole grains and beans may be helpful in the reducing of some cancers. Diets high in fat are well known to be problematic in heart disease, but may also increase the risk of cancer.

**Diabetes**

Diabetes screens should be done every three years starting at the age of 45. High risk patients may need testing earlier and more frequently (38). The simplest screen and most common way to look for diabetes involves looking at a fasting blood sugar (39). Two glucose readings over 126 mg/dl is diagnostic for diabetes. The USPSTF also recommends screening adults with blood pressure consistently above 135/80 mm Hg for type 2 diabetes (40).

**Prevention:** The prevention of diabetes revolves around controlling risk factors known to increase the risk of diabetes.

The first step in treating, as well as preventing, diabetes is to incorporate lifestyle changes known to be helpful in diabetes. Lifestyle changes - including diet, exercise, and smoking cessation - have the potential to appreciably impact the natural path of the disease.

*Diet:* Weight loss is essential to controlling diabetes. The risk of diabetes can be significantly reduced with a weight loss of as little as 5 to 10 pounds. Diets should incorporate a variety of foods including vegetables, fruits, whole grains, low-fat dairy products and lean meats. Diets high in simple sugars such as juice, white bread and candy may lead to spikes in blood sugar. Therefore, these foods
should be eaten in limited quantities.

Exercise can provide many benefits to the patient afflicted with or at risk for the development of diabetes. First, it aids in weight loss, which can help prevent diabetes. Exercise, specifically aerobic exercise such as walking, biking and swimming, improves insulin sensitivity and in those with prediabetes or diabetes this is extremely helpful in improving blood glucose control. This means that cells are better able to use insulin resulting in lower blood sugar. This effect lasts up to 48 hours after an exercise session so exercise should be performed at least every other day to derive benefits of improved insulin sensitivity. Exercise also improves cholesterol and blood pressure both of which need strict control in all patients, especially diabetes.

Health care follow up is another key factor in the prevention of diabetes. Those with diagnosed diabetes need regular follow up with the health care system to prevent diabetic complications.

Heart Disease

Heart disease, which affects 15 million Americans, is the number one killer of Americans and significantly contributes to disability among Americans (41). These numbers may be even higher because much heart disease goes unrecognized.

Coronary heart disease is typically caused by atherosclerosis, which occurs when plaque builds up on the walls of the arteries. This causes them to narrow. When the arteries around the heart – the coronary arteries - become occluded with plaque, blood flow is reduced which can cause angina, shortness of breath
or if there is a complete occlusion a heart attack.

Risk Factors

The key to preventative health care in heart disease is to understand the risk factors and control them. Some of the risk factors are modifiable – or ones that can be changed - some are not (see table 8 and 9).

Table 8: Non-modifiable Cardiac Risk Factors

- Family history of heart disease
- Age
- Being male

Table 9: Modifiable Cardiac Risk Factors

- Dyslipidemia
- Diabetes
- Hypertension
- Physical inactivity
- Cigarette smoking
- High levels of blood homocysteine
- Inflammation
- Stress
- Abdominal obesity
- Diet low in fruit and vegetables
Non-modifiable risk factors

Non-modifiable risk factors are factors that if present increase the risk for heart disease and there is no intervention that will change them.

A positive family history includes having a first degree relative with heart disease. A first-degree relative is a parent, sibling or child. It is considered a particularly strong risk factor if the family member had an onset of disease before age 55 in a male relative and below 65 in a female relative.

Males have a high risk for heart disease at a younger age. The risk starts to equalize after women hit menopause, but in men death rates remain higher (41).

Age is the last non-modifiable risk factor. The older one becomes the more at risk he or she is for heart disease.

Modifiable risk factors

Modifiable risk factors can cause heart disease which can be changed.

Cholesterol: Cholesterol is used to build cell membranes and helps create steroid hormones, bile acids and vitamin D. While there are many positive effects and essential characteristics of cholesterol, too much bad cholesterol increases the risk of cardiovascular disease. Controlling lipid levels reduces death, cardiovascular disease and strokes. Cholesterol is considered a top cardiovascular risk factors. Optimizing cholesterol delays heart disease and reduces its complications.

Three subtypes of cholesterol are reported on a typical lipid panel. Total cholesterol is not as important as the components of cholesterol. The low-density lipoprotein (LDL) cholesterol is the most damaging cholesterol particle and is the
primary target in treatment (42). The LDL cholesterol carries cholesterol to tissues in the body and will accumulate in the blood and attach to the blood vessel wall if there is excess LDL cholesterol. This is the subtype of cholesterol that can result in the most benefit from lowering - the lower the LDL the better. Most recent guidelines recommend that values should be less than 160 mg/dl for the low risk patient; below 130 mg/dl if the patient is at moderately risk; and if the patient is high risk with a diagnosis of heart disease and/or diabetes below 100 mg/dl; and some high risk patients warrant values less than 70 mg/dl (42).

The high-density lipoprotein (HDL) is considered the good cholesterol. The HDL cholesterol takes the LDL cholesterol away from the vessel where it does the most damage. The minimum number that should be achieved is 40-50 mg/dl in men and 50-60 mg/dl in women – the higher the better.

Triglycerides are another number reported on the lipid panel. The role of triglycerides is less clear in the development of heart disease. It is recommended that the people strive to achieve triglyceride levels less than 150 mg/dl (42).

The United States Preventative Task Force (USPSTF) recommends that men over age 35 should be screened for lipid disorders and those between the age of 20 and 35 should be screened if at increased risk for heart disease (43). The USPSTF advocates that women over 45 have their lipid level evaluated; and women at increased risk should have their lipid levels checked between the ages of 20 and 45.

Reduction in cholesterol, specifically LDL cholesterol, decreases the
progression of heart disease and may reduce established disease. Cholesterol reduction is accomplished through lifestyle changes – mainly diet and exercise - and with multiple medications. First line medications recommended for the treatment of heart disease are the statins (atorvastatin, simvastatin and pravastatin).

**Diabetes:** Having diabetes significantly increases the risk of heart disease. Hyperinsulinemia and hyperglycemia have the potential to damage blood vessels. For those with diabetes or prediabetes, controlling blood sugar, blood pressure and cholesterol are important in the prevention of heart disease.

Anyone with established heart disease or risks for heart disease should be screened for diabetes. High levels of blood sugar and insulin levels damage the heart and vascular system.

**Hypertension:** High blood pressure increases the risk for heart disease. Optimal goals include reducing the blood pressure to less than 120/80 mmHg. All people over the age of 18 should be screened for hypertension (45). Early detection of this disease will help reduce the incidence of cardiovascular events.

This needs to be treated aggressively because increased blood pressure increases the strain on the cardiovascular system as well as other organs such as the kidneys. Continued strain on the heart increases the risk of damage. Beta-blockers are one medication that should be strongly considered in patients with hypertension and heart disease. Beta-blockers have positive effects in those after a heart attack as well as patients with congestive heart failure in preventing deterioration of the disease.
**Physical inactivity:** Lack of exercise is a clear risk for heart disease. Exercise (or lack of) can affect a variety of other risk factors for cardiovascular disease. Regular exercise decreases blood pressure, raises HDL cholesterol and decreases insulin resistance (12, 13).

**Smoking:** Cigarette smoking is a strong risk factor for heart disease. In fact, smoker’s risk of developing heart disease is 2-4 times higher than non-smokers (41). Toxins in cigarette smoke have been shown to damage the vascular wall and may precipitate plaque formation. Smoking only one cigarette a day significantly increasing the risk of heart attack over a non-smoker.

**Stress:** Chronic daily stress likely increases the risk for heart disease (41). Whether there is a direct link of the stress causing a chemical cascade that is damaging to the heart or if the stress influences lifestyle choices (such as overeating) that affect the heart is unknown (41).

**Abdominal obesity:** A large waist circumference increases the risk of coronary heart disease (44). Weight gain negatively affects many of the other risk factors for heart diseases. The direct effect of obesity on the risk for heart disease is a question of debate but weight gain increases insulin resistance, blood pressure, risk of diabetes and cholesterol.

**Eating few fruits and vegetables:** Fruits and vegetables have antioxidants and fiber that are protective against heart disease (36). While the use of antioxidant supplementation has not proven effective in the treatment of CAD (50), eating a diet high in fruits and vegetables is encouraged as a method to reduce the risk of heart disease.
Many dietary changes can have a beneficial effect on heart disease. Those who eat fatty fish have a lower risk for heart disease. The AHA recommends eating fish at least two times a week. They recommend fish that are high in omega 3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). This can be found in salmon, lake trout, herring, mackerel, sardines and albacore tuna (41).

**Excessive alcohol use:** It is believed that drinking 1 drink a day for the female and 1 to 2 per day for men reduces the risk of heart disease. Drinking more than this amount has the potential to increase the risk of not only heart disease but stroke, liver problems, gastrointestinal problems, erectile dysfunction and cancer (41).

**High level of blood homocysteine:** This is a relatively newly discovered risk factor. High levels of this chemical may increase the risk of vascular events. These levels can be reduced with the addition of folic acid, vitamins B6 and B12. Homocysteine levels are higher in patients with cardiovascular disease and it may damage the vascular wall making it more likely to develop plaque. The American Heart Association recommends trying to get the recommended daily value of folic acid and other B vitamins through dietary sources. The use of supplements may help if the diet is inadequate (41).

**Inflammation:** High levels of inflammation in the body booster the risk for heart disease. A blood test – the high sensitivity C-reactive protein (hs-CRP) - may help determine risk for heart disease. Studies have showed that high levels of hs-CRP foretell recurrent coronary events in patients with a history of unstable
angina and acute myocardial infarction. Higher hs-CRP levels also are associated with lower survival rates in these patients. After adjusting for other factors, hs-CRP is helpful as a predictor of cardiovascular events (49).

Risk Reduction

Reducing risk factors for heart disease decreases the risk of future cardiovascular events and is a vital component to treating and preventing heart disease. Unfortunately, it is unknown if years of exposure to risk factors for heart disease can be reversed. Risk reduction is done through a combination of lifestyle modifications and medications. For those with established heart disease, risk factors should be treated with specific medicines known to not only treat the risk factor but the heart disease itself, such as beta blockers and statins.

Other forms of cardiovascular disease include: stroke, anyresum, and peripheral artery disease. In 2005, stroke death rates were below the goal of 50 deaths per 100,000 people; only 47 per 100,000 people died from stroke (4). Part of the reason that death rates are improved is because of early treatment of stroke as patients are able to recognize warning signs earlier and get early medical intervention.

Screening for carotid artery disease is a common way to detect those at risk for stroke. The USPSTF does not recommend screening those without symptoms. While screening has the potential to pick up disease and prevent a stroke, there is risk of a false positive test. This false positive test may lead to invasive testing such as angiography which has the potential to cause harm. Magnetic resonance angiography may also be used as a confirmatory test, but it
also has a significant false positive rate. Therefore, screening with duplex ultrasonography in asymptomatic people is associated with more harm than benefit (46).

Abdominal aortic aneurysm screening by ultrasound is recommended for men between the ages of 65-75 who have ever smoked (47). Evidence has shown that smokers are at increased risk for rupture and screening is therefore warranted. No recommendation is made for those in this age group that have never smoked. Women should not be screened.

Peripheral artery disease (PAD) is an atherosclerotic obstruction of the arteries in the legs. It can lead to non-healing wounds, leg pain and even amputation. Screening for PAD is performed with the use of an ankle to brachial index (ABI). This is the ratio of systolic blood pressure in the lower extremity divided by the systolic pressure in the brachial artery. When the number is above 0.9 it is considered normal. The USPSTF does not advise screening in asymptomatic patients as the harms of routine screening are larger than the possible benefits (48). Those who are smokers and have symptoms indicative of this disease (such as intermittent claudication) should discuss this test with their physician.

**Sexually Transmitted Disease**

Sexually transmitted diseases (STDs) are infections that are typically spread by sexual contact through contact with the vagina, penis, anus and mouth. The organisms that cause STDs are suited to contact with mucous membranes and do not live well out side the body. STDs can also be passed from mother to baby
during delivery. STDs are a group of diseases that are well suited to prevention.

STDs have a latent stage that is problematic in transmission and persistence. As many people are infected and asymptomatic. Some may not feel the need to practice safe sex when they do not have symptoms as they feel they are disease free.

Condyloma acuminatum, human immunodeficiency virus, Chlamydia, herpesvirus, gonorrhea, syphilis, trichomonas vaginitis, chancroid, granuloma inguinale, scabies, louse infestation and bacterial vaginosis are common STDs. This section will discuss a few STDs

Gonorrhea is a STDs caused by *Neisseria gonorrhoeae*, a bacterium that typically develops and multiplies in the warm, moist regions of the female reproductive tract, including the cervix, uterus, and fallopian tubes. It can also be found in the urethra in women and men. Infection can also be found in the mouth, eyes, throat, joints and anus.

Gonorrhea rates among females 15-44 years old is 267 per 100,000 people. There is a large racial disparity. Black-Americans have a rate of 1261 per 100,000 people while the rates among whites are 97 per 100,000 (4).

Men with gonorrhea may have no symptoms or may have dysuria or urethral discharge from 2 to 30 days after the onset of infection (51). Testicles may become painful and edematous. Gonorrhea can lead to epididymitis, which may progress to infertility if not treated.

Women may also be asymptomatic with infection, but symptoms may present with burning on urination, vaginal discharge or vaginal bleeding. Women are at
risk for the development of pelvic inflammatory disease and consequent infertility when infected with gonorrhea.

When infection settles in the rectum symptoms may include soreness, painful bowel movements, bleeding, rectal discharge or anal itching (51).

Chlamydia – the most frequently reported bacterial STD- is caused by the bacterium, *Chlamydia trachomatis*. Like many STDs patients afflicted are often asymptomatic. When symptoms occur they present 1 to 3 weeks after exposure. If symptoms are present women present with abnormal vaginal discharge or dysuria. Women can be afflicted by PID from Chlamydia (52).

Chlamydia also can cause discharge from the penis or dysuria in an infected man. Men may complain of genital itching. Infection may be present in the rectum and throat (52).

In females between the ages of 15-24, 6.9-15.3% had Chlamydia in 2004. HP2010 wants Chlamydia rates to be 3% in males and females (4). The rate of Chlamydia in males 15-24 is 20.2% in STD clinics (4).

Syphilis is caused by the bacterium *Treponema pallidum* and often presents with symptoms that are suggestive of many other diseases.

Syphilis rates are quite a bit lower than other STDs. In 2004, 2.7 per 100,000 people had primary or secondary syphilis (4).

Syphilis often presents without symptoms, but even those without symptoms remain at risk to transmit the disease as well as suffer from complications. The disease is classified in three stages: primary, secondary and latent. The primary stage is marked by a lesion or multiple lesions that presents on average 21 days
but typically occurs 10-90 after infection. The lesion is firm, round, and painless and is present at the entry site of the disease. The sore typically lasts 3 to 6 weeks (53).

The secondary stage is marked by a mucous membrane lesions and a non-itching skin rash. The rash starts as the primary lesion heals and is often noted on the hands and feet. Other symptoms include fever, pharyngitis, lymphadenopathy, hair loss, weight loss, headaches, myalgias and fatigue (53).

If the disease remains untreated up to this point it may progress to the latent stage. This stage only occurs in about 15% of people who have not been treated and usually does not appear for 10-20 years after infection. Complications can be severe and include: dementia, gradual blindness, neurological dysfunction and death.

Genital herpes is caused by the herpes simplex viruses type 1 (HSV-1) or type 2 (HSV-2). Most cases of genital herpes is caused by HSV-2. Many cases are mild, but some can be severe and debilating. The disease is characterized by blisters (that ulcerate after they break and may take up to 2-4 weeks to heal (54) on or around the genitals or rectum. The disease tends to reoccur but the number of outbreaks usually deceases over time. The disease is more common in women because male-to-female transmission is more common than female-to-male transmission (54). The virus is released from infected sores but infection can be transmitted between outbreaks. Consequently, condom use may not protect against transmission, if virus is transmitted from a lesion in the genital region but not on the genitals.
Genital herpes rates are 17% between the years of 1988-1994 among women who are 20-29 (4).

The first outbreak usually occurs within two weeks after the virus is transmitted, and the sores typically heal within two to four weeks. Other signs and symptoms during the primary episode may include a second crop of sores, and flu-like symptoms, including fever and swollen glands. However, most individuals with HSV-2 infection never have sores, or they have very mild signs that they do not even notice or that they mistake for insect bites or another skin condition.

**Prevention of STDs**

Preventing STDs is as simple as avoiding any situation where they may be transmitted. This is not always possible. Therefore, there are many strategies one can use to minimize risk. Abstinence from sex is one strategy. Having sex with only one person who is not infected with a STD is another. If having sexual relations with a person who has an STD or an unknown STD status than a latex condom with lubricant should be used, but may not protect against all STDs. If both partners have a STD, a condom is recommended to prevent transmission of a different infection or a different strain of infection.

Condoms lessen the risk of getting some STDs if used properly during every sexual encounter. A condom protects only covered areas. Washing the genitals, urinating, or douching after sex does not protect against STDs (51).

While it is uncomfortable, sexual partners should talk about drug use, HIV status and all other sexually transmitted diseases with each other. If testing has
not been done, both partners should get tested before a sexual relationship is started.

HIV can be transmitted by injection drug use as well as through sexual contact. Illegal drug use has the potential to transmit disease and those who do inject drugs should use precautions including: not sharing needles, using disposable needles and using only clean needles.

Those who are circumcised are at lower risk for developing HIV than those who have not been circumcised (55).

While not getting a STD is the best strategy to reduce the impact they have on the country; early recognition of signs and symptoms is important to prevent transmission to others. If symptoms are noticed, a timely evaluation by a health care provider is critical so testing and treatment can commence.

Patients who have been diagnosed with STDs should make all previous partners aware so they can have proper testing.

Prevention and proper treatment of STD is critical so the incidence of pelvic inflammatory disease (PID) can be reduced. PID is an infection of the uterus, ovaries, and fallopian tubes. Chlamydia and gonorrhea are the two most common diseases that are responsible for PID.

In 1995, 8% of females between the ages of 15-44 had treatment of pelvic inflammatory disease. Those with a STD or PID had rates of fertility problems of 27% in 1995. Goals for HP2010 are 15%.

High risk women for PID include: women who douche after sex, sexually active women, women with multiple partners and being less than 25 years old.
Symptoms of PID are often mild, but at times the symptoms can be severe and the patient presents with fever, vaginal discharge, lower abdominal pain, vaginal bleeding and dyspareunia.

The prevention of PID is as simple as preventing STDs or the treatment of the infection caused by the STD. PID that goes untreated increase the risk of getting the disease again and possibly causing scaring in the reproductive tract to a point where pregnancy is not possible. It also increases the risk of ectopic pregnancy which can lead to death.

**Thyroid**

The thyroid should be checked every five years starting at the age of 35 (56). Those with thyroid disease or who have a family history of thyroid disease may require testing earlier and more frequently. Other organizations have dissimilar opinions about screening. The USPSTF finds insufficient evidence to advocate for or against regular screening for thyroid disease in adults (57).

**Conclusion**

Preventative health care needs to become a more integral part of the American health care system. If all health care providers and health care consumers put a greater emphasis on prevention an increase in life expectancy and life quality would be seen.

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IMPORTANT. These services are free only when delivered by a doctor or other provider in your plan’s network. End highlighted text. To put in simple words, preventive health is taking care of your health in such a way that you protect your self from getting any disease or disability. Of course, this is an ideal that we can only aspire to. We certainly cannot prevent disease compl...

Â , MBBS, MD Medicine and Healthcare & Preventive Medicine, Kolkata, West Bengal, India. Answered 2 years ago Â· Author has 345 answers and 1.1M answer views. What is preventive health? Why is preventive health care important? Preventive health care services are important for everyone, especially for older adults. This is because your risk for health problems increases as you age. Preventive services are important for everyone, especially for older adults. This is because your risk for health problems increases as you age. By preventing problems, or identifying them early, you are more likely to live a longer, healthier, and more satisfying life. What are preventive services? Preventative care and services are performed in an effort to prevent major illness or injury. Learn more about the types of preventative care and services.

Common examples of preventative care are immunizations and yearly physicals. In fact, any screening test done in order to catch a disease early is considered a preventative service, such as routine Pap tests for women or prostate exams for men. Talk to your health care provider: To know which covered preventive services are right for you â€“ based on your age, gender, and health status â€“ ask your health care provider. For More Information. Learn about the U.S. Preventive Services Task Force recommendations. For information on preventive practices, check out healthfinder.gov. Â Content created by Assistant Secretary for Public Affairs (ASPA) Content last reviewed on February 1, 2017.