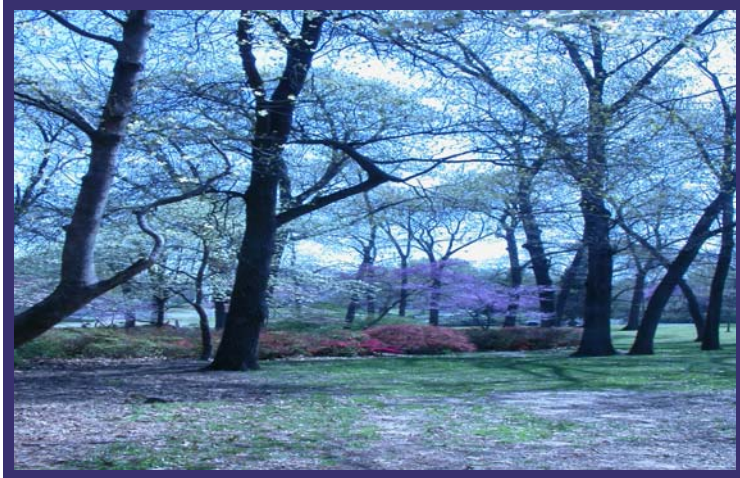


2004 Strategic Plan

Oklahoma Heart Disease and Stroke Health Program



*Woodward Park
Tulsa, OK
Photographed by Hannah Comstock*

First Edition

Strategic Efforts through 2010

- *Modifiable Risk Factors*
- *Policy and Environmental Approaches*
- *Early Recognition Systems*
- *Disease Management*
- *Data and Surveillance*

This publication was supported by the Oklahoma Heart Disease and Stroke Health Program's Cooperative Agreement # U5O/CCU 621326 from the Centers for Disease Control and Prevention.

Its contents are solely the responsibility of its authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

**Mission Statement
of
Chronic Disease Service
Disease and Prevention Services
Oklahoma State Department of Health**

To partner with public, private, and voluntary agencies to enable Oklahomans to live increasingly long, healthy, satisfactory lives by:

Preventing death and disability from chronic disease;

Screening for early detection of disease;

Promoting health behaviors throughout the lifespan; and

Promoting environmental and policy changes.

Table of Contents



Acknowledgements	6
Executive Summary	8
Introduction	12
Heart Disease and Stroke Burden in Oklahoma	16
Modifiable Risk Factors	24
Hypertension	24
High Blood Cholesterol	27
Overweight and Obesity	28
Poor Nutrition	29
Physical Inactivity	31
Tobacco Use	31
Diabetes	32
Metabolic Syndrome	33
Policy and Environmental Approaches	34
The Plan	38
Primary Prevention Goals and Strategies	38
Secondary Prevention Goals and Strategies	41
Early Recognition Systems Goals and Strategies	43
Disease Management Goals and Strategies	45
Improved Quality of Life and Reduced Burden of Heart Disease and Stroke	46
Data and Surveillance Goals and Strategies	46
References	48
Appendices	50

Acknowledgements



Established Partnerships

Internal Partners

Oklahoma State Board of Health

Oklahoma State Department of Health

Energy Force

Chronic Disease Service

- Diabetes Prevention and Control
- Heart Disease and Stroke Health Program
- Obesity Prevention and Control
- REACH 2010—Oklahoma Native American Project
- Take Charge! Program

Community Development Service

- Arthritis Prevention and Education
- Turning Point

Emergency Medical Service Division

Injury Prevention Service

Maternal and Child Health Services

- Child and Adolescent Health Division
- School Health
- Women's Health Division

Nutrition Service

Tobacco Use Prevention Service

Wellness Committee

Women, Infants, and Children Service

Health Care Information

External Partners

American Heart Association

Heartland Affiliate

American Stroke Association

Heartland Affiliate

Association of American Indian Physicians

Association of HMOs

American Lung Association of Oklahoma

Cardiac Science

Career Tech

Oklahoma Department of Career and

Technology Education

Centers for Disease Control and Prevention

Choctaw Nation Health Services Authority

Deaconess Hospital

Department of Agriculture

Department of Education

Department of Parks and Recreation

Governor's Council on Physical Fitness and

Health

INTERxVENT

Integris Health System

Kirkpatrick Science and Air Space Museum

at Omniplex

Native American Tobacco Coalition

Oklahoma Association of Regional Councils

of Government

Oklahoma City-County Health Department

Oklahoma Cooperative Extension Service
Oklahoma Employees Benefits Council
Oklahoma Foundation for Medical Quality
Oklahoma Health Care Authority
Oklahoma Public Health Association
Oklahoma Restaurant Association
**Oklahoma State and Education Employee
Group Insurance Board**
Oklahoma State Medical Association
Pawnee Nation REACH 2010 Program
Southwestern Oklahoma State University
St. Anthony's Hospital
University of Central Oklahoma
University of Oklahoma
College of Medicine
Via Christi Memorial Hospital
Via Christi Regional Medical Center

*Sunset at Lake Hefner
Oklahoma City, OK
Photographed by Hannah Comstock*



Executive Summary



Oklahoma's Challenge

Heart Disease and Stroke in Oklahoma were the first and third leading cause of death and accounted for over 44% of all deaths in the state in 2001. In 2001, Oklahoma had the third highest rate of deaths due to diseases of the heart and the 10th highest rate of deaths due to stroke in the United States. Over 25% of Oklahoma's adult population had either high blood pressure or high blood cholesterol, major risk factors of heart disease, stroke, and death. Oklahomans also had and continue to have high rates of smoking, a major cause of heart disease and stroke. Oklahomans in 2002 had one of the lowest rates for physical activity and consumption of fruits and vegetables: major risk factors. The economic burden of being hospitalized for heart disease and stroke was over 2.6 billion dollars in 2001.

Disparities

African American males have the highest death rate for heart disease among all racial and ethnic groups. Native Americans, both males and females, have the highest death rates for stroke. Lifetime rates for high blood pressure are greatest for African American males and multiracial groups. Females have a higher number of deaths due to heart disease and stroke than males.

Signs and Symptoms Recognition

According to the 2003 Behavioral Risk Factor Surveillance System, almost half of Oklahoma adults did not know that pain in the jaw, neck, or back are symptoms of a heart attack and nearly one-third did not know that feeling weak, lightheaded, or faint are symptoms of a heart attack. Also, over one-third of Oklahoma adults did not think sudden trouble seeing or loss of vision and severe headache with no known cause are signs of a stroke and nearly two-thirds did not know that sudden chest pain is not a sign of a stroke.

Taking Action

The Oklahoma Heart Disease and Stroke Network presents this strategic plan for all Oklahomans to use as a framework for improving the quality of care for persons and families with heart disease and stroke, reducing the risk factors among all Oklahomans to prevent heart disease and stroke, reducing the disparities in health status among persons with heart disease and stroke, and improving on the early recognition, action, and healthcare response needed to reduce death and disability related to heart attack and stroke. The strategic plan provides a framework through 2010 with recommended action steps.

Strategies focus on seven over-arching goals that include:

- Increasing the number of Oklahomans with high blood pressure who have their high blood pressure under control;
- Increasing the number of Oklahomans with total blood cholesterol less than 200 mg/dl;
- Increasing the number of Oklahomans who know the risk factors for heart disease and stroke,
- Increasing the number of Oklahomans who know the signs and symptoms of heart attack and stroke, and the importance of dialing 911;
- Improving emergency response to heart attack and stroke in Oklahoma;
- Improving quality of heart disease and stroke care in Oklahoma; and
- Eliminating disparities (in terms of race, ethnicity, gender, geography, or socio-economic status).

Oklahoma is addressing the priority focus areas of heart disease and stroke through a four-tier approach, which includes Improved Quality of Life and Reduction of the Burden of Cardiovascular Disease, Disease Management, Early Recognition Systems, and Risk Factor Detection and Control through Primary and Secondary Prevention and Policy and Environmental Approaches. Each area relates directly to the Healthy People 2010 objectives. This plan builds on existing activities underway in Oklahoma through initiatives, collaborations, and coalitions. The plan is

designed to create overall systems change including environmental, communities, healthcare, and consumers.



Improve Quality of Life and Reduce the Burden of Cardiovascular Disease: Reduce deaths from heart disease and stroke, reduce hospitalizations due to congestive heart failure among older adults; increase the control of high blood pressure and high blood cholesterol among adults.

- Deliver interventions to individuals with established cardiovascular disease and/or CVD risk factors including, high blood pressure, high cholesterol, diabetes, overweight and obesity, physical inactivity, or smoking while utilizing eHealth technologies.
- Implement the Centers for Disease Control and Prevention resource “Making the Business Case for Prevention and Control of Heart Disease and Stroke” for Oklahoma small businesses and state agencies.
- Provide incentives to Oklahoma state agencies and their employees that are heart healthy environments.
- Work with small businesses to reach populations, where they are, to provide benefit of being heart healthy.
- Provide consistent and frequent communication to businesses on signs and symptoms of heart attack and stroke, the importance of dialing 9-1-1, and CPR and AED use.



To improve the management of heart disease and stroke through utilizing the chronic care disease management model and by increasing blood pressure and blood cholesterol control among adults.

- Work with Oklahoma businesses and insurance plans to provide coverage incentives for consumers to decrease risks factors associated with heart attack and stroke.
- Make the business case to Oklahoma State and Education Employee Group Insurance Board to cover cost of eHealth technology for consumers of Health Choice insurance.
- Partner with federally funded Primary Care Centers that are developing cardiovascular collaborative models to increase standards of care as it relates to prevention and control of high blood pressure and high blood cholesterol.
- Partner with American Heart Association to continue Operation Heartbeat and Operation Stroke committees throughout Oklahoma.



To increase knowledge among Oklahomans on early recognition of heart attack and stroke, importance of rapid emergency care, and to improve the emergency response system.

- Partner with Oklahoma Association of Regional Councils of Government to distribute

Automated External Defibrillators (AEDs) to rural Oklahoma communities and partner with communities to educate on the recognition of signs and symptoms of heart attack and stroke, the importance of dialing 9-1-1, and training of CPR and use of AED.

- Implement American Heart Association's Speaker's Bureau in Oklahoma to increase knowledge and understanding of heart attack and stroke signs and symptoms and the importance of getting immediate medical attention to reduce death and disability.
- Develop and implement school-aged appropriate education related to recognition of signs and symptoms of heart attack and stroke, the importance of dialing 9-1-1, and training of CPR and AED use, in conjunction with the Kirkpatrick Science and Air Space Museum at Omniplex and their museum network, the American Heart Association, and others.
- Partner with Oklahoma Hospital Association, Stroke Centers, Neuroscience Center, and health care professionals to implement cardiovascular "best practices".
- Partner with American Heart Association to continue Operation Heartbeat and Operation Stroke committees throughout Oklahoma.



Improve Risk Factor Detection and Control through Primary and Secondary Prevention and Policy and Environmental Approaches.

- Partner with community organizations to promote collaborative planning among school personnel, students, families, community agencies, and businesses to develop, implement, and evaluate tobacco and obesity prevention among youth and adults.
- Promote worksite, facility, and community policies on “physical activity friendly” and “heart healthy” food choices.
- Partner with other statewide coalition to promote policies that benefit Oklahomans across the lifespan, such as “24/7 smoke free”, “physical activity friendly”, and “heart healthy.”
- Partner with organizations to implement “The Heart Truth”, “Women on the Move”, and other best practices to improve the knowledge among women about women and heart disease.
- Partner with organizations to implement best practices to reduce disparities.

Introduction



Cardiovascular disease refers to a variety of diseases and conditions affecting the heart and blood vessels, the two largest being heart disease and stroke. Congestive heart failure; hypertension (also known as high blood pressure); and diseases of the arteries, veins, and circulatory system are other diseases and conditions included in the term cardiovascular disease. Cardiovascular disease is the leading cause of death and disability, and is also a large contributor to health care costs for Oklahomans. In 2001, heart disease cost the nation \$193.8 billion according to the Centers for Disease Control and Prevention. It is also responsible for unnecessary suffering and reduced quality of life. In 2001, Oklahoma had the third highest rate of deaths due to diseases of the heart, only behind Mississippi and the District of Columbia, and had the 10th highest rate of deaths due to stroke.¹

Every 29 seconds someone will suffer a heart attack and every 60 seconds someone will die from this event. Every 45 seconds someone will suffer a new or reoccurring stroke. Many people believe that heart disease and stroke are diseases primarily of older people and men, but heart disease and stroke are the leading causes of death in both males and females and in all racial and ethnic groups. Sudden cardiac deaths have also

increased dramatically among people younger than 35 years.²

In 2001, heart disease accounted for approximately 29% of deaths among United States (U.S.) residents, killing more than 700,000; 16.8% of those deaths occurred among persons less than 65 years of age.³ Stroke accounted for 6.8% of deaths, killing over 163,000 persons in the U.S. Reducing premature death from heart disease and stroke and working to eliminate disparities will require preventing, detecting, treating, and controlling risk factors for heart disease in young and middle-aged adults.

The Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention funds the Oklahoma State Department of Health (OSDH), Chronic Disease Service through a cooperative agreement to implement strategies for the Heart Disease and Stroke Health Program. The accomplishments of the Heart Disease and Stroke Health Program include focused efforts on four major activities:

- 1) recruitment of a multi-disciplinary team;
- 2) recruitment of new partners and expansion of the Oklahoma Stroke Coalition which formed the Oklahoma Heart Disease and Stroke Network;

- 3) enhancement of scientific capacity to assess existing data systems and development of tools to conduct an inventory of policy and environmental strategies; and
- 4) development, implementation, and evaluation of community-based pilot projects.

The Heart Disease and Stroke Health Program focuses on community-based collaborative programs, population-wide health promotion programs, and policy and environmental changes at the state and local level. This plan is coordinated with the goals and objectives from Healthy People 2010 in mind, which provides an outcome-based framework for future cardiovascular health efforts in Oklahoma.

This plan outlines the resources, vision, goals, and strategies needed to significantly reduce heart disease and stroke, and its associated costs in Oklahoma. Basic principles of community-based risk reduction and prevention as well as strategies, collaborations, services, and activities that can be implemented in various settings to improve cardiovascular health in Oklahoma are also included in this state plan. This plan will serve as a guide for the Oklahoma Heart Disease and Stroke Health Program and its partners; and is intended to be an outline for constructing a comprehensive and effective assortment of interventions to reduce multiple risk factors throughout the state in various workplace, school, healthcare, and community settings.

This document provides direction for strategic efforts throughout the next decade; a second edition is expected by 2010. This plan includes discussion of the following:

- The first section describes the burden of heart disease and stroke in Oklahoma.
- The second section discusses Heart Disease and Stroke Modifiable Risk Factors, Policy and Environmental Approaches, Early Recognition Systems, and Disease Management.
- The final section describes Cardiovascular Risk Factor Detection and Control through the use of Primary Prevention, Secondary Prevention, Policy and Environmental Approaches, Early Recognition Systems, Disease Management, as well as Data and Surveillance.

Partners have clearly articulated the burden statement of Oklahoma's cardiovascular disease (CVD) problem. The results of the policy and environmental inventory were compiled and a thorough review of population-based strategies were cataloged so the Network could begin the development of the Strategic Plan for the Oklahoma Heart Disease and Stroke Health Program. The future of Oklahoma's Heart Disease and Stroke Health Program includes building upon previously established collaborative efforts and implementing primary and secondary prevention strategies in an effort to reduce the mortality and disability rates of heart attack and stroke. The Oklahoma Heart Disease and Stroke Health

Program implementation strategies focus on seven priority areas, which include:

1. Increasing the number of Oklahomans with high blood pressure under control;
2. Increasing the number of Oklahomans with total blood cholesterol less than 200 mg/dl;
3. Increasing the number of Oklahomans who know the signs and symptoms of heart attack and stroke, and the importance of dialing 911;
4. Increasing the number of Oklahomans who know the risk factors for heart disease and stroke.
5. Improving emergency response to heart attack and stroke in Oklahoma;
6. Improving quality of heart disease and stroke care in Oklahoma; and
6. Eliminating disparities (in terms of race, ethnicity, gender, geography, or socio-economic status).

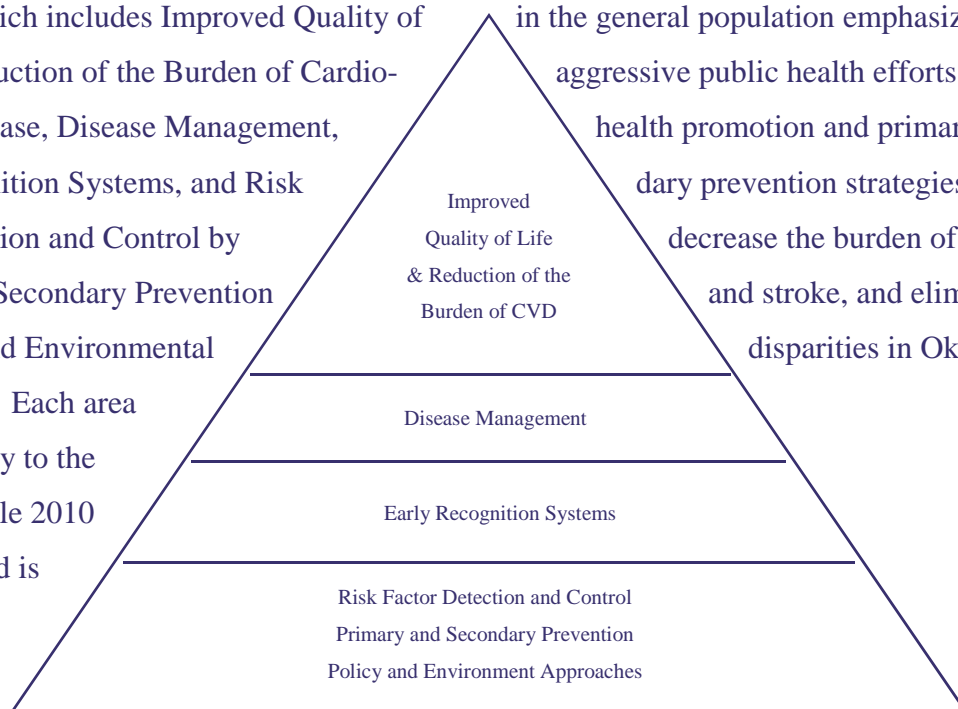
Oklahoma is addressing the priority focus areas of heart disease and stroke through a four-tier approach, which includes Improved Quality of Life and Reduction of the Burden of Cardiovascular Disease, Disease Management, Early Recognition Systems, and Risk Factor Detection and Control by Primary and Secondary Prevention and Policy and Environmental Approaches. Each area relates directly to the Healthy People 2010 objectives and is

addressed within this strategic plan.

Risk factors for heart disease include high blood pressure, high cholesterol, overweight and obesity, poor nutrition, physical inactivity, tobacco use, and diabetes. Preventing and/or treating these risk factors can reduce premature death from heart disease and stroke.

This plan builds on existing activities underway in Oklahoma through initiatives, collaborations, and coalitions. The plan is designed to create overall systems change including environmental, communities, healthcare, and consumers.

Public health professionals in Oklahoma should focus efforts on prevention and risk reduction at all ages, and particularly at younger ages among racial/ethnic minorities. The proportion of deaths among persons under the age of 65 years and the high prevalence of the major risk factors in the general population emphasize the need for aggressive public health efforts. Improved health promotion and primary and secondary prevention strategies are needed to decrease the burden of heart disease and stroke, and eliminate health disparities in Oklahoma.



Burden in Oklahoma



Morbidity

According to American Heart Association, over 64 million Americans (almost one-fourth of the nation's population) live with some form of cardiovascular disease. Over 25,000,000 are estimated to be age 65 or older⁴.

Cardiovascular disease is heart disease and stroke. Heart disease and stroke are caused by atherosclerosis (hardening of arteries). Atherosclerosis is a gradual, years-long development of disease in the medium sized and large arteries that supply blood flow to the heart, brain, and lower extremities. Plaque forms within the artery wall, weakens the way, and can limit blood flow or restrict completely. The plaque may suddenly rupture causing a blockage of the artery and leads to a heart attack or stroke.

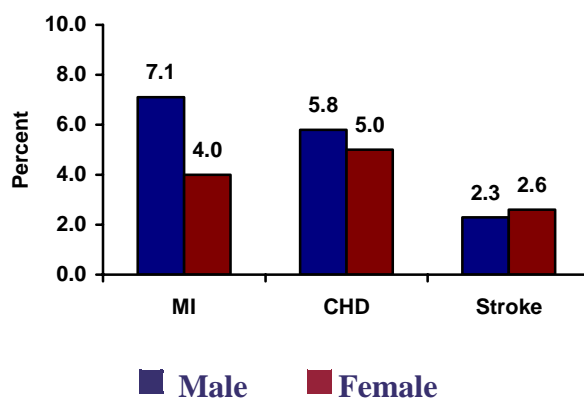
Atherosclerosis begins to develop during childhood and progresses into adulthood. The disease is made worse by the risk factors of high blood pressure, high blood cholesterol, diabetes, smoking, sedentary lifestyle, diets high in fat and calories, and obesity.

Cardiovascular disease prevalence is based on the Oklahoma Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is an

ongoing, state-based, random-digit dialing telephone survey of the non-institutionalized adult population, ages 18 years and older.

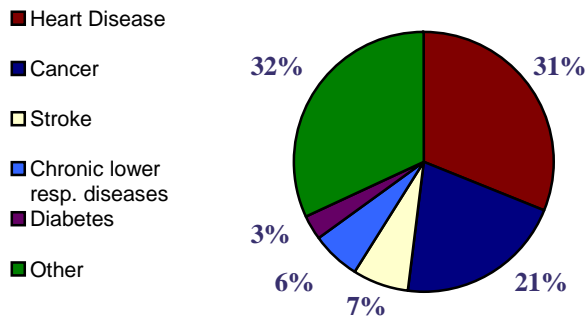
Lifetime prevalence rates of coronary heart disease (CHD), myocardial infarction (MI), and stroke are based on self-reporting of a physician's or other health professional's diagnosis. According to the 2001 BRFSS, the prevalence rate of a lifetime myocardial infarction among males was almost twice the rate of females;

Figure 1.
Prevalence of Myocardial Infarction, Coronary Heart Disease, and Stroke by Gender: Oklahoma BRFSS 2001



however there were no significant differences in rates of lifetime CHD or stroke by gender.

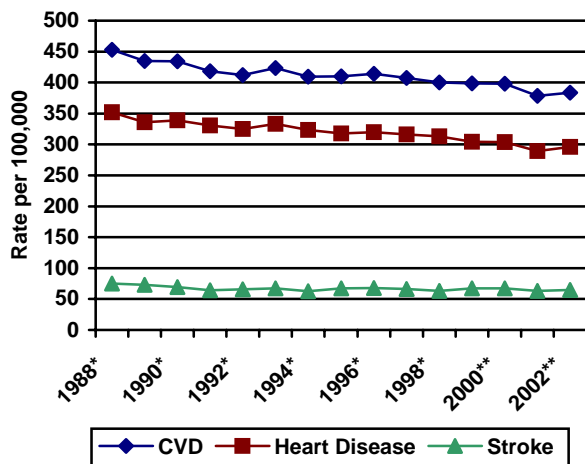
Figure 2. Leading Causes of Death
(Oklahoma Vital Statistics 2002)



Mortality

Heart disease and stroke are the first and third leading causes of death among Oklahomans, accounting for over one-third of the total deaths. While mortality rates for cardiovascular disease and heart disease have decreased significantly over the past 15 years, the mortality rate for stroke has not.

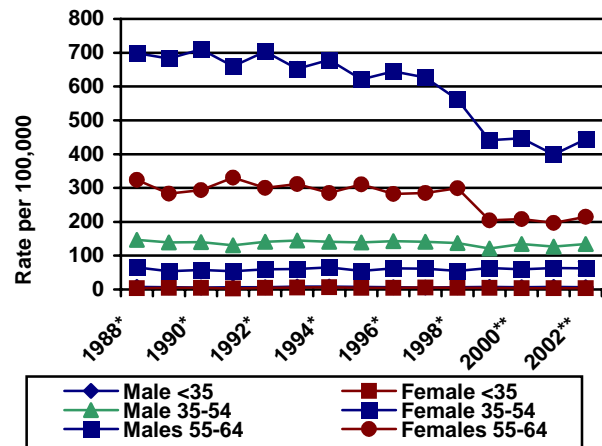
Figure 3. Oklahoma Cardiovascular Disease, Heart Disease, and Stroke Age-Adjusted Mortality Trends (Vital Statistics 1988-2003)



*ICD-9 codes **ICD-10 codes

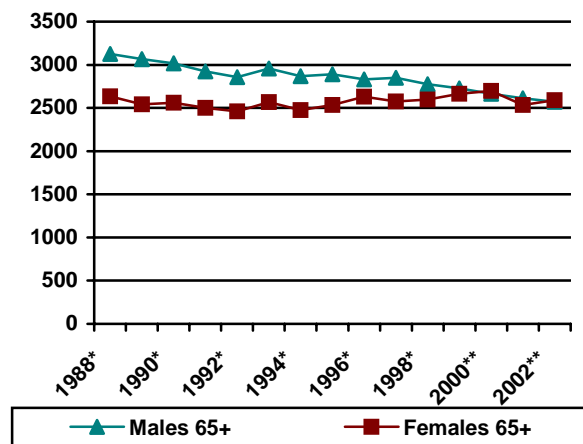
The rate of CVD deaths increases by three times from the 35-54 age group to the 54-65 age group for both genders. However, while a 6-fold increase in mortality rate is seen among males in the 55 to 64 year age group to the 65 and older age group, a 12-fold increase is seen among females.

Figure 4. Oklahoma Cardiovascular Disease Mortality Trends Among Persons <65 years of age, by Gender (Vital Statistics 1988-2003)



*ICD-9 codes 390-448 **ICD-10 codes I00-I78

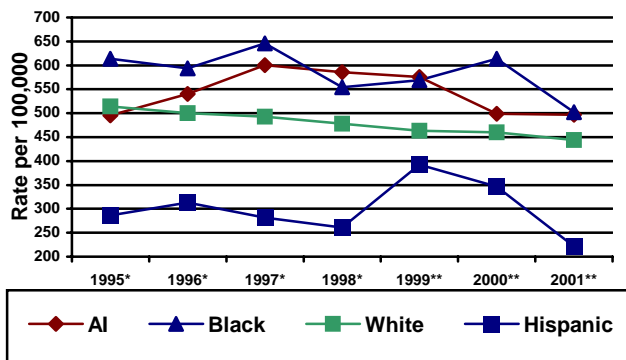
Figure 5. Oklahoma Cardiovascular Disease Mortality Trends Among Persons >65 years of age, by Gender (Vital Statistics 1988-2003)



*ICD-9 codes 390-448 **ICD-10 codes I00-I78

For most years from 1995-2001, the age-adjusted cardiovascular mortality rates were highest for African American males and lowest for Hispanic females.

Figure 6. Oklahoma Cardiovascular Disease Age-Adjusted Mortality Trends Among Males by Race+/Ethnicity (Vital Statistics 1995-2001)

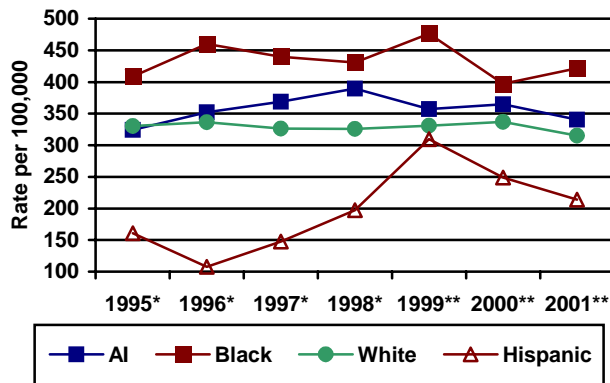


*ICD-9 codes 390-448 except 405 (secondary hypertension)

**ICD-10 codes I00-I78

+Indian Health Service-linked rates

Figure 7. Oklahoma Cardiovascular Disease Age-Adjusted Mortality Trends Among Females by Race+/Ethnicity (Vital Statistics 1995-2001)



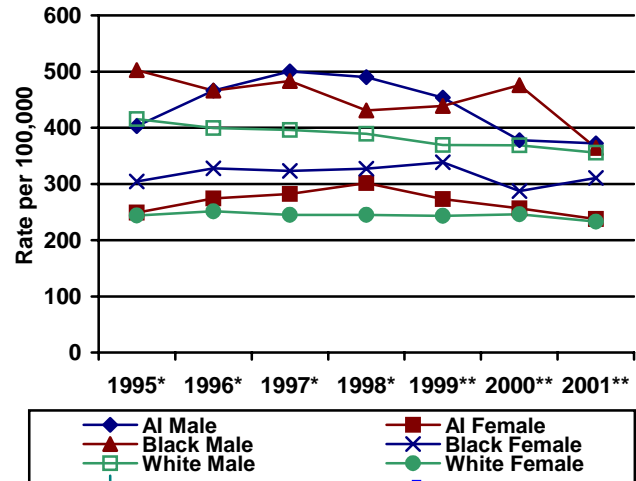
*ICD-9 codes 390-448 except 405 (secondary hypertension)

**ICD-10 codes I00-I78

+Indian Health Service-linked rates

For most years from 1995-2001, the age-adjusted heart disease mortality rates were highest for African American males and lowest for white females.

Figure 8. Oklahoma Heart Disease Mortality Trends by Race+ and Gender (Vital Statistics 1995-2001)



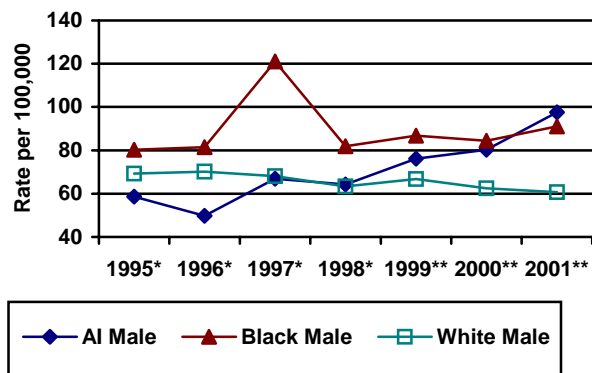
*ICD-9 codes 430-438

**ICD-10 codes I60-I69

+Indian Health Service-linked rates

African American males had the highest age-adjusted stroke mortality rates from 1995 to 2000, while American Indian males had the highest rate in 2001.

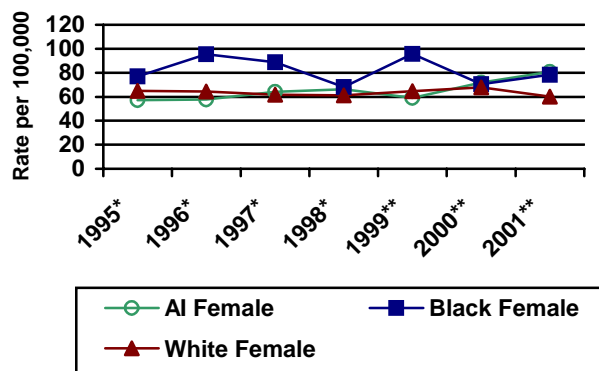
Figure 9. Oklahoma Age-Adjusted Stroke Mortality Trends Among Males by Race+ (Vital Statistics 1995-2001)



*ICD-9 codes 430-438
 **ICD-10 codes I60-I69
 +Indian Health Service-linked rates

The age-adjusted stroke mortality rates were highest for African American females for most years from 1995-2000, while the mortality rate was highest for American Indian females in 2001.

Figure 10. Oklahoma Stroke Mortality Rates Among Females by Race+ (Vital Statistics 1995-2001)



*ICD-9 codes
 **ICD-10 codes
 +Indian Health Service-linked rates

Hospital and Associated Costs

Oklahoma hospital discharge data from 2001 was used for reporting the number of hospitalizations and hospital charges related to stroke. This data is limited in that it reports encounters rather than individuals and it does not include federal hospitals such as the Indian Health Service and the Veterans Affairs hospitals.

- There were 141,401 discharges totaling over \$2.6 billion with CVD as the primary or secondary diagnosis. Females accounted for 57% of the discharges.
- There were 57,049 discharges totaling over \$1 billion for coronary heart disease as the primary or secondary diagnosis. Males accounted for 52% of discharges.
- There were 17,574 discharges totaling over \$300 million for stroke as the primary or secondary diagnosis. Females accounted for 57% of the discharges.
- There were 9,227 discharges totaling over \$280 million for myocardial infarction as the primary or secondary diagnosis.
- There were 22,576 discharges totaling over \$500 million for atrial fibrillation as the primary or secondary diagnosis.
- There were 34,318 discharges for congestive heart failure as the primary or secondary diagnosis totaling over \$600 million.

From the data presented the economic cost of cardiovascular disease in Oklahoma exceeds \$2.6 billion annually.

Early Recognition Systems

Heart attack and stroke are life-and-death emergencies -- every second counts. When a person has any of the associated symptoms, dialing 9-1-1 can be the difference between life and death. Not all signs occur in every heart attack or stroke. Sometimes they go away and return. Today heart attack and stroke victims can benefit from new medications and treatments unavailable to patients in years past. For example, clot-busting drugs can stop some heart attacks and strokes in progress, reducing disability, and saving lives. However, to be effective, these drugs must be given relatively quickly after heart attack or stroke symptoms first appear. Therefore, it is important to increase the awareness of signs and symptoms associated with heart attack and stroke, increase the awareness of the importance of calling for emergency assistance immediately, and increase the number of lay people who can administer cardiopulmonary resuscitation (CPR) when they witness a cardiac event.

A national education campaign carried out by the National Heart, Lung, and Blood Institute and the American Heart Association, "Act in Time", lists the most common heart attack warning signs as:

- Pain or discomfort in the center of the chest;
- Discomfort in one or both arms, back, neck, jaw, or stomach; shortness of breath; and
- Other signs, such as breaking out in a cold sweat, nausea, and light-headedness. (For

more information, please visit <http://www.nhlbi.nih.gov/actintime/index.htm>.)

According to the 2003 Behavioral Risk Factor Surveillance System, almost half of Oklahoma adults did not know that pain in the jaw, neck, or back are symptoms of a heart attack and nearly one-third did not know that feeling weak, light-headed, or faint are symptoms of a heart attack.

Table 1. Knowledge of Heart Attack Symptoms Among Oklahoma Adults: Oklahoma BRFSS 2003

	<i>Yes</i>	<i>No</i>	<i>Don't know/ Not sure</i>
<i>Pain in the jaw, neck, or back</i>	53%	22%	25%
<i>Feeling weak, light-headed, or faint</i>	70%	12.9%	17%
<i>Chest pain or discomfort</i>	93.9%	2.3%	3.9%
<i>Trouble seeing out of one or both eyes</i>	34.7%	29.5%	35.8%
<i>Pain or discomfort in the arms or shoulders</i>	85.6%	5.9%	8.4%
<i>Shortness of breath</i>	87.4%	4.5%	8.0%

The major warning signs of stroke are:

- Sudden numbness or weakness in the face, arm, or leg, especially on one side of the body;
- Sudden confusion, trouble speaking, or understanding;
- Sudden trouble seeing in one or both eyes;

- Sudden trouble walking, dizziness, loss of balance or coordination; and
- Sudden severe headache with no known cause.

If a person has one or more of these signs, dial 9-1-1 immediately, and get them to a hospital right away. The key to heart attack and stroke survival is getting medical attention as soon as possible. If treatment is given right away many people can avoid long-term disability and make a good recovery (American Stroke Association, 2002).

According to the 2003 BRFSS, over one-third of Oklahoma adults did not think sudden trouble seeing or loss of vision and severe headache with no known cause are signs of a stroke and nearly two-thirds did not know that sudden chest pain is not a sign of a stroke.

Table 2. Knowledge of Stroke Symptoms Among Oklahoma Adults: Oklahoma BRFSS 2003

	<i>Yes</i>	<i>No</i>	<i>Don't Know/ Not Sure</i>
<i>Sudden confusion or trouble speaking</i>	87.2%	2.6%	10.2%
<i>Sudden numbness or weakness of face, arm, or leg, especially on one side</i>	90.4%	2.7%	6.9%
<i>Sudden trouble seeing in one or both eyes</i>	64.6%	7.5%	28.0%
<i>Chest Pain or Discomfort</i>	39.6%	30.8%	29.5%
<i>Sudden trouble walking, dizziness, or loss of balance</i>	85.8%	3.3%	11.0%
<i>Severe headache with no known cause</i>	59.7%	10.8%	29.5%

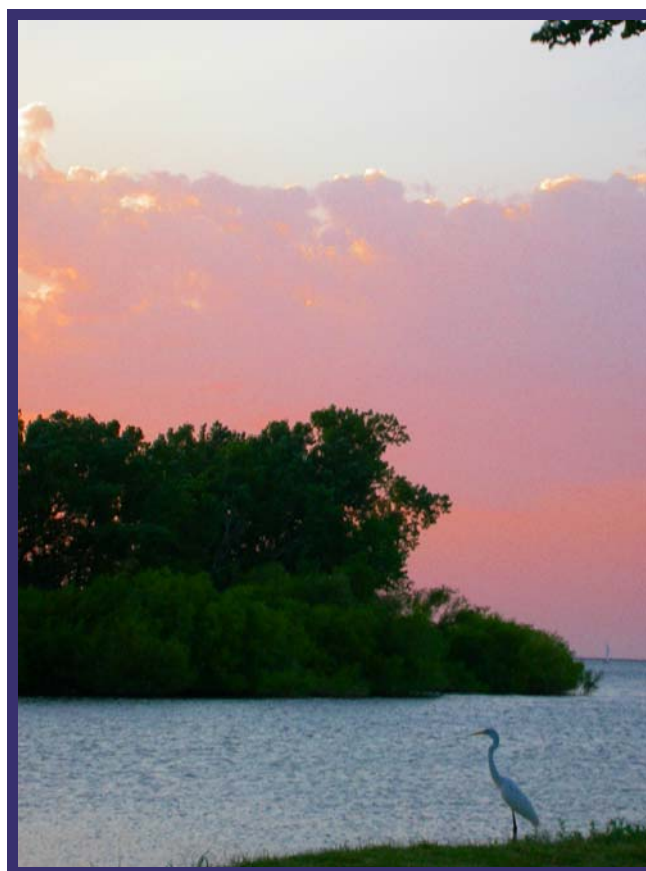
Disease Management

High blood pressure, high cholesterol levels, and elevated blood glucose are serious risk factors for cardiovascular disease and often health care providers recommend an array of medications to treat these conditions. However, the American College of Cardiology Scientific Sessions released in March of 2004, concludes that many patients with classic cardiovascular disease risk factors can achieve risk reduction goals without medications within only three months of initiating therapeutic lifestyle changes. With the current rising health care costs, utilizing a disease management system is a more economical means, while having a greater impact on risk factors associated with heart disease and stroke.

Oklahoma began conducting a Cardiovascular Risk Reduction and Cardiovascular Disease Reduction Program pilot-study in an Oklahoma-based state agency, which focuses on the risk for heart attack and stroke through the prevention and control of high blood pressure and high cholesterol by incorporating medication management, exercise training, nutrition counseling, and other theory-based lifestyle interventions. The baseline data showed that over 85% of the pilot population was overweight and over 75% of them did not exercise regularly. After six months of participation, collectively, these employees have reduced their risk of developing coronary heart disease in the next ten years by 12.2%, while the higher-risk employees reduced

their risk of developing coronary heart disease in the next ten years by 15.7% (based on Framingham prediction algorithms).

*Lake Hefner
Oklahoma City, OK
Photographed by Hannah Comstock*



Modifiable Risk Factors



Major modifiable risk factors for heart disease and stroke as well as risk factors which increase death from heart disease and stroke include high blood pressure, high cholesterol, obesity, poor nutrition, physical inactivity, tobacco use, and diabetes. These risk factors will be briefly introduced in this section and will be discussed in more detail in the following sections.

Prevention and control of hypertension and high blood cholesterol through disease management therapies, weight control with proper nutrition and physical activity, and the prevention and control of tobacco use, diabetes, and metabolic syndrome must be achieved to lower the incidence of morbidity and mortality rates for heart disease and stroke in Oklahoma. It has been estimated that tobacco use is responsible for about 440,000 deaths per year in the United States, and poor nutrition and physical inactivity account for at least 300,000 deaths per year in the United States. Risk factors associated with cardiovascular conditions often occur together and as the number of risk factors increases, so does the likelihood of heart disease and stroke.

Behavior change models have shown that delivering prevention and control strategies through multiple channels to a target segment of the population can be successful. Programs

reaching a variety of settings, such as schools, worksites, the health care system, and community groups have the potential to impact the greatest number of people. Environmental supports such as policy and systems changes have also shown to have a great influence on sustainable change in large populations. Strategies to reduce heart disease and stroke health must focus on key risk factors while utilizing a variety of channels to achieve a successful outcome.

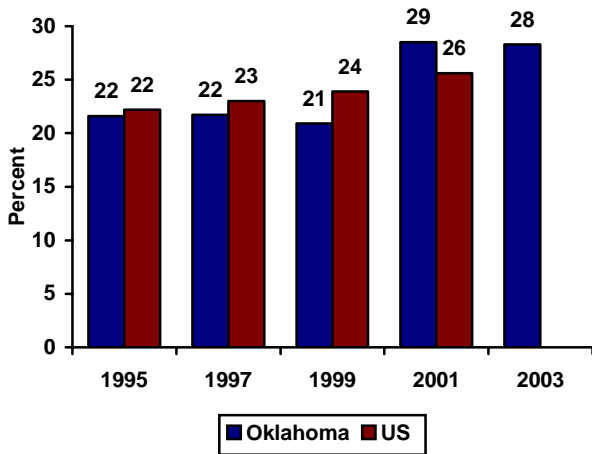
Hypertension

Blood pressure is the force of blood against the walls of arteries. Under normal conditions, blood pressure rises and falls throughout the day. When blood pressure stays elevated over time, it is known as high blood pressure, or hypertension. Hypertension is dangerous because of its excessive workload on the heart and contributes to atherosclerosis (hardening of the arteries). It increases the risk of heart disease and stroke, as well as congestive heart failure, kidney disease, and blindness. Therefore, as blood pressure increases, the likelihood of death and disability increases. Although blood pressure generally rises with age, uncontrolled high blood pressure is no less a risk factor in the elderly than in the young. High blood pressure increases the risk of stroke two to four times. Successful, long-term

treatment of high blood pressure reduces risk of stroke by as much as 33%.

Lifetime hypertension prevalence was ascertained from the Behavioral Risk Factor Surveillance System (BRFSS) which is a randomized telephone survey. The prevalence of lifetime hypertension among Oklahoma adults has increased since 1999 by over 25%. According to the Oklahoma BRFSS, more than one in four Oklahoma adults have been told by a health professional they have high blood pressure. In the last few years, the prevalence has increased by over one-third.

Figure 11. Trends in Prevalence of Lifetime Hypertension: 1995-2003



The prevalence of lifetime hypertension was significantly higher among Non-Hispanic African American and Multi-Racial adults versus that of white adults.

Over three-fourths of Oklahoma adults with hypertension currently take medicine for their

hypertension, although males and American Indians are less likely to do so.

Figure 12. Lifetime Hypertension Prevalence by Race/Ethnicity: Oklahoma BRFSS 2003

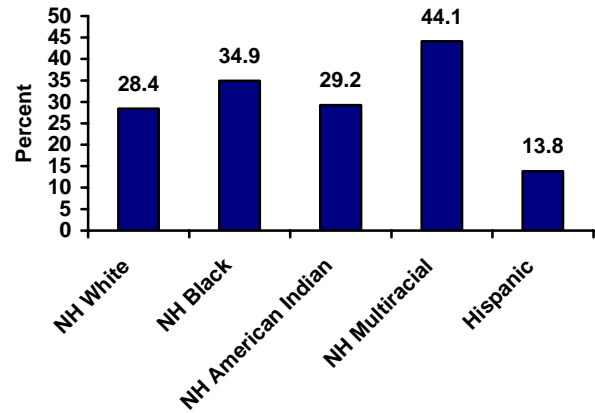


Figure 13. Prevalence of Hypertension by CVD Among Oklahoma Adults: Oklahoma BRFSS 2001

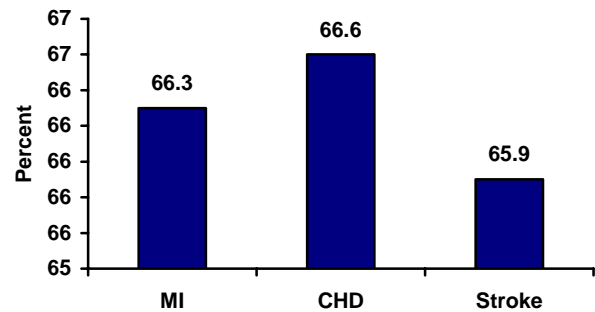


Figure 14. Adults With Hypertension who Currently Take Medication for Their Hypertension by Gender: Oklahoma BRFSS 2003

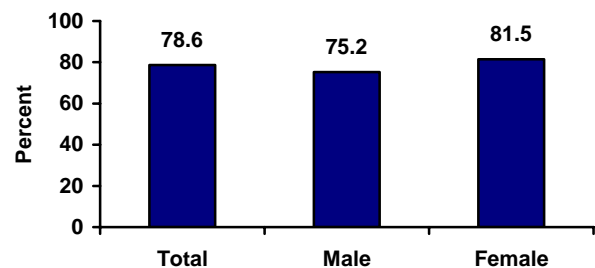
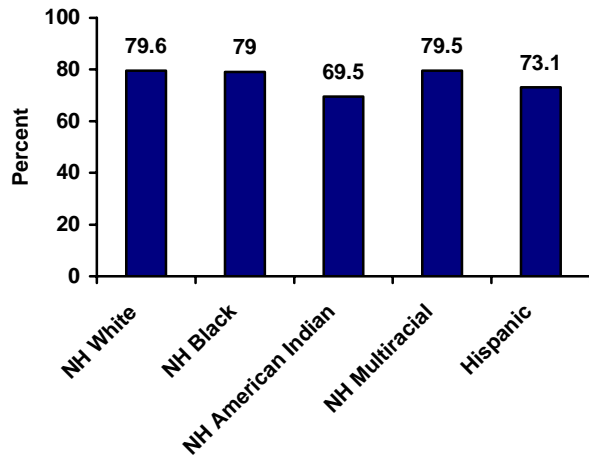


Figure 15. Adults With Hypertension who Currently Take Medication for Their Hypertension by Race/Ethnicity: Oklahoma BRFSS 2003



Everyone can take steps to prevent and control high blood pressure. Steps include:

1. Maintain a healthy weight.
2. Be physically active.
3. Follow a healthy eating plan.
4. Reduce sodium in your diet.
5. Drink alcohol only in moderation.
6. Take prescribed drugs as directed.

The National Heart, Lung, and Blood Institute (NHLBI) released new clinical practice guidelines for the prevention, detection, and treatment of high blood pressure in May of 2003⁵. The guidelines, which were approved by the Coordinating Committee of the NHLBI’s National High Blood Pressure Education Program (NHBPEP), feature altered blood pressure categories, including a new “pre-hypertension” level – which covers about 22 percent of American adults, or

roughly 45 million people. Based on the national percentage, it can be estimated that over 560,000 Oklahoma adults fall within the “pre-hypertension” category. Key aspects of the new guidelines include:

- A new “pre-hypertension” level and merging of other categories. The new report changes the former blood pressure definitions to: normal, less than 120/less than 80 mm Hg; pre-hypertension, 120-139/80-89 mm Hg; stage 1 hypertension, 140-159/90-99 mm Hg; stage 2 hypertension, at or greater than 160/at or greater than 100 mm Hg. The previous categories were optimal, normal, high normal, and hypertension stages 1, 2, and 3. Stages 2 and 3 were combined because their treatment is so similar. The new pre-hypertension stage is to bring attention to people that they have a real risk to develop high blood pressure.

Category	Systolic	Diastolic
Normal	≤120	≤80
Pre-Hypertension	120-139	80-89
Stage 1	140-159	90-99
Stage 2	≥160	≥100

- Simplified and strengthened drug treatment recommendations. The guidelines recommend use of a diuretic, either alone or in combination with another drug class, as part of the treatment plan in most patients.

- Use of additional drugs for severe hypertension or to lower blood pressure to the desired level. According to the new report, most people will need two, and at times three or more, medications to lower blood pressure to the desired level.
- Recommend clinicians work with patients to agree on blood pressure goals and develop a treatment plan.
- Bring new attention to diagnosing and treating high systolic blood pressure.

High Blood Cholesterol

Cholesterol is a fat-like substance (lipid) that is present in cell membranes and is a precursor of bile acids and steroid hormones. Cholesterol travels in the blood through distinct particles containing both lipids and proteins (lipoproteins). Two classes of lipoproteins found in the serum of a fasting individual include: low density lipoproteins (LDL) and high-density lipoproteins (HDL). LDL cholesterol typically makes up 60 – 70 percent of the total serum cholesterol. LDL is the major atherogenic lipoprotein and has long been identified by the National Cholesterol Education Program (NCEP) as the primary target of cholesterol-lowering therapy. This focus on LDL has been strongly validated by recent clinical trials, which show the efficacy of LDL-lowering therapy for reducing risk for coronary heart disease. HDL normally makes up 20 – 30 percent of the total serum cholesterol. HDL-cholesterol levels are inversely correlated with

risk of coronary heart disease. Some evidence indicates that HDL protects against the development of atherosclerosis, although a low HDL level often reflects the presence of other atherogenic factors.

The risk of cardiovascular disease increases as the level of serum cholesterol increases. High blood cholesterol, or hypercholesterolemia, describes levels of serum cholesterol that are associated with an increased risk of atherosclerosis and cardiovascular disease. When cholesterol levels in the blood stream are high, cholesterol is deposited in blood vessel walls, a condition called atherosclerosis. These deposits form plaques that inhibit blood flow or even rupture the blood vessels, causing acute cardiovascular events or death. When blood flow to the heart is impeded, this can result in angina pectoris or myocardial infarction. When blood vessels in the brain rupture or their blood flow is stopped, this results in a stroke. High blood cholesterol, but particularly high LDL cholesterol is the best predictor for heart disease and stroke risk. Recent studies have shown that lowering total and LDL cholesterol reduced the chance of having a heart attack and dying from heart disease-related causes⁶.

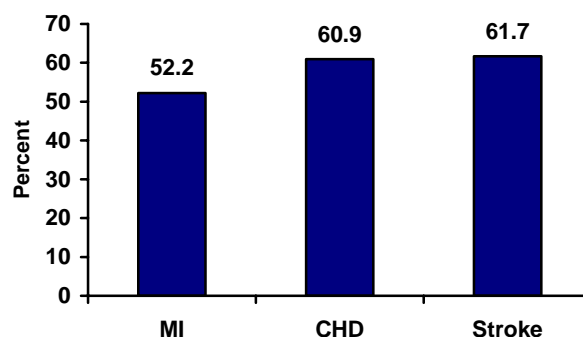
Over half of Oklahoma adults who reported having a myocardial infarction and nearly two-thirds who reported having CHD or a stroke had been told by a health care professional they have high cholesterol.

New guidelines for cholesterol-lowering treatment were released in 2004 from the National Cholesterol Education Program (NCEP). NCEP concluded that people with a very high risk for a heart attack may benefit from even lower “bad” or LDL cholesterol levels than previously recommended. The new optional target level for LDL, is below 70 mg/dl of blood. The update means that high-risk patients may still be considered for cholesterol-lowering drug therapy, 1.

The updated guidelines broaden treatment options for high-risk individuals so they have a better chance to reduce their risk of heart attack and death. The high-risk category includes people who have a history of heart attack, unstable angina, coronary artery procedures (such as angioplasty or bypass surgery), peripheral artery disease, abdominal aortic aneurysm, carotid artery disease (transient ischemic attack or ischemic stroke), diabetes, or two or more risk factors with a greater than 20 percent risk of heart attack or death in the next 10 years.

Total Cholesterol (mg/dL)		LDL Cholesterol (mg/dL)	
<200	Desirable	<100	Optimal
		100-129	Near Optimal / Above Optimal
200-239	Borderline	130-159	Borderline
			High
≥ 240	High	160-189	High
		≥190	Very High

Figure 16. Prevalence of High Cholesterol Among Oklahoma Adults with CVD: BRFSS 2001



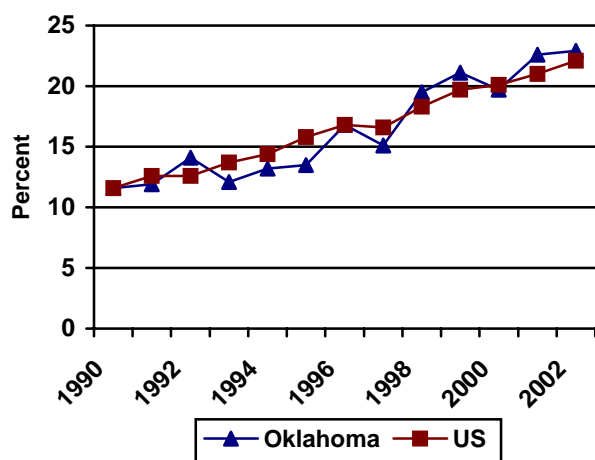
Overweight and Obesity

Overweight and obesity, which can be prevented through increased physical activity and improved nutritional intake, are major contributors to high blood pressure, high blood cholesterol, heart disease, stroke, diabetes, and osteoarthritis. According to the Surgeon General’s Call to Action to Prevent and Decrease Overweight and Obesity, in 2000, the total cost of obesity was estimated to be \$117 billion (\$61 billion direct and \$56 billion indirect)⁷. Most of the cost associated with obesity is due to coronary heart disease, hypertension, and diabetes. It is projected that by 2008, the combined direct and indirect financial costs of treating our overweight and obesity epidemic, including money spent on related illnesses, lost work, and dietary products, will surpass the \$1.3 billion currently needed annually to address the negative effects of smoking and the use of tobacco products. According to Tommy G. Thompson, U.S. Secretary of Health, “obesity has become a crucial health problem for our nation, and these findings show the medical

costs alone reflect the significance of the challenge. Of course, the ultimate cost to the Americans is measured in chronic disease and early death. We must take responsibility both as individuals and working together to reduce the health toll associated with obesity.” According to the most recent estimates, the annual obesity-related medical expenditures for U.S. adults is \$75 billion and the obesity-related medical expenditures for Oklahoma adults is \$854 million⁸.

Body Mass Index (BMI) is a common measure expressing the relationship (or ratio) of weight-to-height. BMI is a mathematical formula in which a person’s body weight in kilograms is divided by the square of his or her height in meters (wt/(ht)²). BMI is more highly correlated with body fat than any other indicator of height and weight. Individuals with a BMI of 25 to 29.9 are considered overweight, while individuals with a BMI of 30 or more are considered obese⁸.

Figure 17. Oklahoma and US Obesity (BMI ≥ 30) Trends 1990-2002 BRFSS



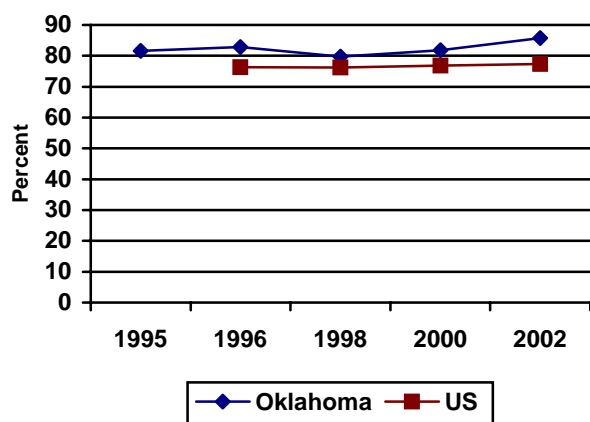
The prevalence of obesity among adults has nearly doubled since 1990 in Oklahoma and in the United States. The goals of obesity intervention must be two-fold. The first is to prevent obesity in the non-obese. The second is to prevent further weight gain and encourage weight loss in individuals already overweight or obese. Even modest weight loss is clearly associated with health benefits (improvement in blood pressure, lipid profiles, and enhanced glucose tolerance). Reversing the obesity epidemic requires not only changes in individual behavior, but also the elimination of societal barriers to healthy lifestyle choices.

Poor Nutrition

Unhealthy diet is a leading contributor to heart disease and stroke due to high-fat, low-fiber intake, which contributes to elevated cholesterol levels, overweight and obesity, and diabetes. There are many food choices available to build a healthy diet. Yet, despite having many healthy food options available, Oklahomans generally consume a high-fat, high-calorie, and low-fiber diet. Saturated fat, excess caloric intake, and dietary cholesterol encourage the progression of atherosclerosis, which ultimately leads to cardiovascular disease. Increasing fruit, vegetable, and fiber consumption leaves less room for high-fat foods in the diet. Focusing on healthy nutritional habits could extend Oklahomans’ productive life span and reduce the risk of chronic diseases, including heart disease, stroke, and diabetes.

Poor eating habits are often established during childhood and are carried into adulthood, therefore increasing a person's risk for heart disease, stroke, and diabetes. Along with physical inactivity, poor nutritional habits are a leading cause of overweight and obesity. Nationally, adults and children have too much fat intake and are not eating enough fruits and vegetables.

Figure 18. Oklahoma and US Trends for Adults Not Eating Five or More Servings of Fruits/Vegetables Per Day: BRFSS 1995-2002



In 2002, Oklahoma ranked the highest in the nation for inadequate consumption of fruits and vegetables among adults (85.7%).

According to the CDC, fast food accounts for 40% of the average family's food budget. Oklahoma is currently utilized by the fast food industry as a test market region for high fat, high calorie, and over-sized food choices. This lends itself to the need for Oklahoma to foster a coordinated approach and maximize resources to

expand health-focused nutrition programs, public awareness efforts, and policies to develop environmental supports for increasing the intake of more nutrient rich foods, such as whole grains, fruits, vegetables, healthy cuts of meats, and low fat, calcium rich foods. National dietary strategies, such as the 5-A-Day program, have been established and are utilized by the Oklahoma State Department of Health to link the various health services and provide consistent guidance for healthy eating.

Ten guidelines were developed by the Department of Agriculture and the Department of Health and Human Services to point Oklahomans towards better health¹⁰. The Dietary Guidelines for Americans are appropriate for healthy children, ages 2 and older, as well as adults of any age. The guidelines include:

1. Aim for healthy weight.
2. Be physically active each day.
3. Let the Food Guide Pyramid guide your food choices.
4. Choose a variety of grains daily, especially whole grains.
5. Choose a variety of fruits and vegetables daily.
6. Keep food safe to eat.
7. Choose a diet that is low in saturated fat and cholesterol and moderate in total fat.
8. Choose beverages and foods to moderate your intake of sugars.
9. Choose and prepare foods with less salt.

10. If you drink alcoholic beverages, do so in moderation.

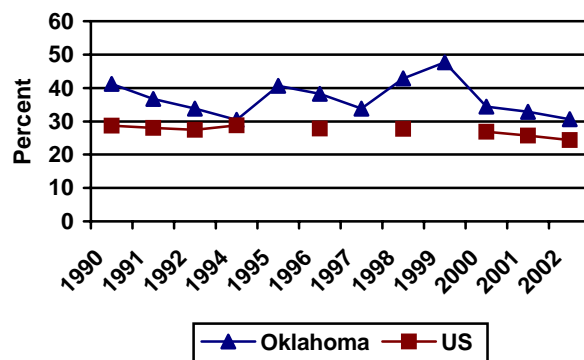
Physical Inactivity

The Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) recommend accumulating a minimum of 30 minutes of moderately intense physical activity on most days of the week. Physically inactive people are nearly twice as likely to develop heart disease compared to those who engage in regular physical activity according to the American Heart Association. Physical activity has been associated with a decreased risk of heart disease, high blood pressure, high blood cholesterol, diabetes, osteoporosis, and colon cancer. It also helps maintain and achieve a healthy body weight; reduce feelings of depression, anxiety, and stress; and help to build and maintain healthy bones, muscles, and joints. Physical activity can help individuals live longer, have a positive mental attitude, and maintain their activities of everyday living. It is important to note that reducing such risks requires developing healthful behaviors among children because risk for heart disease and stroke begin at an early age¹¹.

However, it is also important to note that according to the U.S. Surgeon General's Report on Physical Activity and Health "no one is too old to enjoy the benefits of regular physical activity. Of special interest to older adults is evidence that muscle-strengthening exercises can reduce the

risk of falling and fracturing bones and can improve the ability to live independently¹²."

Figure 19. Oklahoma and US No Leisure Time Physical Activity Trends (1990-2002 BRFSS)



In 2002, Oklahoma ranked fourth highest in the nation for no leisure time physical activity among adults (30.6%).

Tobacco Use

Tobacco use is a primary risk factor for cardiovascular disease, as well as for cancer and chronic lung disease. With its link to heart disease, cancer, chronic lung diseases, and complications of diabetes, tobacco use is responsible for approximately 6,000 deaths each year in Oklahoma, alone.

Cigarette smoking contributes to cardiovascular disease in several ways. Carbon monoxide found in cigarette smoke affects the heart by reducing the amount of oxygen the blood is able to carry. Nicotine, also found in cigarette smoke, causes an increase in heart rate and blood pressure,

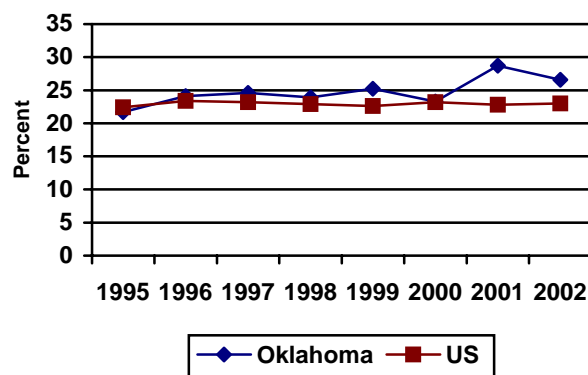
which causes extraordinary “wear and tear” on the cardiovascular system. Blood pressure is increased because cigarette smoke causes the blood vessels to constrict, and it contributes to the development of atherosclerosis, or build-up of fat and cholesterol in the arteries. According to the National Heart, Lung, and Blood Institute, cigarette smokers of any age have a 70 percent greater death rate due to heart disease than non-smokers and they are two times more likely to suffer a heart attack and stroke.

Tobacco use is currently the most important preventable cause of premature death in the United States. It accounts for approximately 417,000 of the more than 2 million annual deaths. Cigarette smokers have a greater risk of developing chronic disorders such as atherosclerosis, several types of cancer, and chronic obstructive pulmonary disease, according to the American Heart Association. Atherosclerosis is the primary contributor to high rate of deaths from smoking.

Cigarette smoking is a widespread and significant risk factor that the Surgeon General has referred to it as “the most important of the known modifiable risk factors for coronary heart disease in the United States.”

Oklahoma ranked 7th in the nation in prevalence of current smoking among adults.

Figure 20. Oklahoma and US Current Smoking Trends: BRFSS 1995-2002



Diabetes

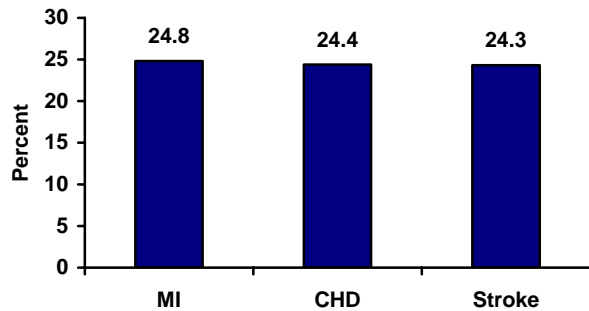
Type 2 diabetes, as a risk factor to cardiovascular disease, is a serious, lifelong condition that can cause devastating complications, including heart disease and stroke. Many of the behavioral risk factors for diabetes – overweight and obesity, poor nutrition, physical inactivity, and tobacco use – are also risk factors for heart disease and stroke. Diabetes is an independent risk factor for cardiovascular disease, as well as coexisting conditions of high blood pressure and high blood cholesterol. People with diabetes have more than double the risk of developing cardiovascular disease than persons without diabetes, even when blood glucose levels are under control. Diabetes increases the risk of stroke up to three times.

Approximately 18.2 million persons in the United States have diabetes, of which 5.2 million are undiagnosed. Diabetes is a major clinical and public health challenge, especially in minority communities where both the prevalence of diabetes and the risk of associated complications is

increased. With proper treatment and lifestyle changes, many of the possibly devastating complications, such as blindness, amputations, heart disease, kidney failure, and premature death, can be prevented or delayed¹³.

Nearly 25% of Oklahoma adults who reported a myocardial infarction, coronary heart disease, or a stroke had been diagnosed with diabetes.

Figure 21. Prevalence of Diabetes Among Oklahoma Adults with CVD: BRFSS 2001



Metabolic Syndrome

The Final Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (ATP III, NHLBI) defines the metabolic syndrome as multiple, interrelated factors that raise risk. This syndrome has become increasingly common in the United States. It is characterized by an assortment of metabolic risk factors in an individual. Various risk factors have been included in the metabolic syndrome. The following list contains factors that are

generally accepted as being characteristic of the syndrome:

- Waist circumference greater than 102 cm (40 inches) in men and 88cm (35 inches) in women.
- Serum triglyceride level of 150 mg/dl or higher.
- High-density lipoprotein (HDL) cholesterol level less than 40 mg/dl in men and 50 mg/dl in women.
- Blood pressure of 130/85 mm Hg or higher.
- Fasting glucose level of 110 mg/dl or higher.

People with metabolic syndrome are at increased risk for developing heart disease and diabetes, as well as increased mortality from cardiovascular disease and all causes. However, limited information is available about the prevalence of the metabolic syndrome in the United States. It is estimated that 47 million Americans have metabolic syndrome, with white men and Hispanic females having a greater prevalence, according to the Centers for Disease Control and Prevention.

Oklahoma does not currently have data regarding Oklahoma residents with metabolic syndrome.

Policy and Environmental Approaches



Policy approaches for this document are defined as laws, regulations, and rules (both formal and informal). Environmental approaches are defined as changes to the economic, social, or physical environment. To gain knowledge of partnering on both policy and environmental changes, an inventory of policies and environmental supports has been developed and distributed to partners. The inventory addressed four settings of influence: community, schools, work-sites, and healthcare. The following are policy and environmental supports identified through the inventory.

Community Indicators:

1. Policies requiring sidewalks, bikeways, greenways, and recreation facilities in new and redeveloped residential and mixed used communities.
2. Policies requiring sidewalks in new road construction and easements dedicated for walking trails.
3. Policies requiring new commercial buildings and site plans to incorporate amenities for physical activity (e.g., pedestrian walkways, sidewalks, bikeways, well lit stairways).
4. Number and miles of sidewalks and walking trails per capita, per land area, or per population density.
5. Reports (e.g., TV, radio, print) and billboards supporting policy or environmental changes for physical activity during the previous 12 months.
6. Policies requiring heart-healthy food and beverage (e.g., water, 100% juice, low-fat milk) choices in their vending machines and dining facilities.
7. Municipal buildings with heart-healthy food and beverage choices in their vending machines and dining facilities.
8. Restaurants and fast food establishments providing heart-healthy choices, as indicated on their menus (e.g., low-fat milk, fruits, and vegetables).
9. Reports (TV, radio, print) and billboards supporting policy/environmental changes for nutrition during the previous 12 months.
10. Policies regulating or prohibiting tobacco use in public places.
11. Policies regulating youth access to tobacco.
12. Policies enforcing crimes and punishment regarding tobacco sales to minors.
13. Policies regulating fortification of flour and cereals with folic acid.
14. Municipal buildings with trained individuals in CPR and the use of Automated External Defibrillator (AED) and which are equipped with AEDs.
15. Routine programs which train individuals in CPR and the use of an AED.

16. Reports through community posters, radio, newspapers, websites, and television supporting enhanced 9-1-1 capabilities in the community and promote the use of 9-1-1, early recognition of heart attack or stroke, and the use of CPR and AED.

School Indicators:

1. Presence of policies at the state/district/school level including daily physical education in school curricula, Pre K-12, for all students. (Note: also consider this for post-secondary education in colleges/universities)
2. Policies at the state/district/school level requiring implementation of classroom instruction in physical education/physical activity, for grades Pre K-12, promoting enjoyable, lifelong participation in physical activity, as part of their required courses.
3. Policies at the state/district/school level requiring at least 20 minutes of scheduled and unstructured daily physical activity (recess) for all elementary school students.
4. Presence of policies at the state/district/school level requiring all physical education and physical activity courses, grades Pre K-12, be overseen by certified PE teachers employed by the school.
5. Policies state/district/school level supporting walking and biking to school.
6. Percent of schools having adequate physical activity facilities, as defined by the CDC *School Health Index Model*.

7. Percent of schools within a school district allowing students and community members to use the physical activity facilities outside of school hours.
8. Presence of policies at the state and/or district levels reinforcing and promoting school meal programs that meet national standards for nutritional quality, as defined by the Child Nutrition Program Services Assessment. (Note – Child Nutrition Program)
9. Presence of policies at the state and/or district levels requiring schools to include nutrition curricula or classroom instruction, as defined in the CDC *School Health Index Module*.
10. Presence of nutrition-related continuing education requirements for those who teach nutrition in the classroom.
11. Presence of policies at the state and/or district levels requiring food service directors to have nutrition-related baccalaureate degree, or certification/credentialing and training from the state or the American Food Service Association.
12. Presence of policies at the state/district/school level providing heart-healthy food choices outside of the food meal services (e.g., concession stands, vending machines, fund-raisers, and a la carte lines that offer heart-healthy foods and beverages).
13. Presence of policies limiting student access to low-nutritive, foods from vendors that compete with school meals during school meal periods (e.g., fast food vendors).

For those schools that provide meals, the presence of policies at the state and/or district levels requiring an adequate amount of time for students to eat school meals—at least 10 minutes to eat breakfast and 20 minutes to eat lunch from the time the children are seated.

15. Increase percent of school food service programs offering appealing, heart-healthy food and beverage choices on their a la carte lines, in school meals, and outside the cafeteria.
16. Increase percent of school food service programs consistently promoting heart-healthy food and beverage items through information, marketing techniques, or pricing strategies, such as signage and point-of-purchase information in the school food service environment (cafeteria).
17. Increase percent of school food service directors and food service staff properly trained in heart-healthy food preparation, presentation, and good customer service.
18. Increase percent of schools with a clean, appealing, and safe dining environment.
19. Increase percent of schools having 24 hour smoke-free campus policies.

Worksite Indicators:

1. Worksites having policies for all employees supporting physical activity during work time, (e.g., during working hours, using flex-time, providing flexible breaks, and lunch periods).
2. Increase percent of worksites with stairs providing prompts or signage to promote their use.
3. Worksites providing exercise/physical activity specific messages and cues for action, (e.g., via posters, brochures, videos, lectures, emails, or newsletters) to the employee population annually.
4. Worksites with policies requiring heart-healthy food and beverage choices (e.g., low-fat, fruits, and vegetables) be provided at worksite cafeterias and in worksite vending machines.
5. Worksites having policies requiring their cafeterias follow healthy food preparation guidelines and practices, (e.g., steaming, low-fat/salt substitutes, limited frying).
6. Worksites with cafeterias, snack bars, or on-site food vendors offering heart-healthy food and beverage choices (e.g., low-fat, fruit/vegetables), assessed via menu analysis or marker items such as low-fat milk.
7. Worksite facilities with trained and designated employees in CPR and the use of AED and which are equipped with AED(s).
8. Worksite programs with routinely trained employees in CPR and the use of an AED.
9. Worksite health programs which routinely administer influenza and pneumococcal vaccines.
10. Employee and employer benefit groups

routinely addressing and providing risk reduction and disease management benefits in employee benefit packages.

Healthcare Indicators:

Partnering with OPERATION HEART BEAT and OPERATION STROKE Initiatives; the following Healthcare policy and environmental changes were recommended:

1. Managed care organizations and indemnity health plans reimburse providers for influenza and pneumococcal prevention for persons with cardiovascular disease.
2. Managed care and/or private practice groups adopt policy to incorporate the American Heart Association “Guide to Primary Prevention of Cardiovascular Diseases” as part of their standard package.
3. Managed care and/or private practice groups adopt policy to incorporate the American Heart Association “Guide to Comprehensive Risk Reduction for Patients with Coronary and other Vascular Disease” as part of their standard care package.
4. Hospitals adopt the American Heart Association “Get with the Heart or Stroke Guidelines” to address improving heart disease and stroke care.
5. Managed care and/or private practice groups adopt policy to routinely provide assessments and counseling for physical activity, smoking cessation, and medical nutrition therapy to plan members as a part of the standard care.
6. Indemnity health plans reimburse providers that routinely provide assessments and counseling for physical activity, smoking cessation, and medical nutrition therapy to their members.
7. Managed care, fee for service, and company wellness programs routinely providing exercise/physical fitness, nutrition, and/or smoking cessation messages and cues for action to members via multiple channels of communication such as posters, monthly magazines, brochures, videos, lectures or websites.
8. Hospital emergency rooms have an organized team to treat, in a timely and appropriate manner, any individual presenting with symptoms of a heart attack or stroke.



Primary Prevention

Healthy People 2010 Objective 12-9:

Reduce the proportion of adults with high blood pressure.

Health People 2010 Objective 12:13:

Reduce the total mean blood cholesterol levels among adults.

Health People 2010 Objective 1:3:

Increase percent of adults who receive counseling on healthy behaviors.

Oklahoma Program Goals:

- By 2010, maintain the current percentage of overweight or obese adults at 60.5% (2003 BRFSS).
- By 2010, reduce the percent of overweight Oklahoma high school students from 11.1% (2003 YRBS) to 10%.
- By 2010, increase the percent of Oklahoma adults who currently meet the recommended intake of 5 or more fruits and vegetables a day from 15.6% (2003 BRFSS) to 20%.
- By 2010, increase the percentage of Oklahoma adults who meet the recommendation of at least 30 minutes of moderate physical activity five or more days per week or 20 minutes of vigorous physical activity three or more days per week from 39.7% to 45%.
- By 2010, reduce the percentage of Oklahoma

adults who currently smoke from 25% (2003 BRFSS) to 20%.

- By 2010, increase the percentage of Oklahoma high school students who participate in physical activity that makes them sweat or breathe hard for 20 minutes or longer for three or more days per week from 64.3% (2003 YRBS) to 70%.

Recommended Strategies:

Overweight and Obesity

1. Take the lead as the public agency to address obesity among all settings, channels, and populations.
2. Partner with state wellness programs and other state agencies to offer incentives to state employees to participate in effective wellness and weight management programs.
3. Partner with the business community to develop incentives to promote healthy lifestyles in the private sector.
4. Promote collaborative planning among school personnel, students, families, community agencies, and businesses to develop, implement, and evaluate nutrition and physical activity programs for youth and adults.
5. Promote strategies to change daily food consumption to include more fruits and vegetables, reduce dependence on high calorie fast foods and substitute water for soft drinks.

6. Partner with health insurance companies to educate members on obesity and document cost savings through obesity treatment programs.
 7. Work toward adequate reimbursement for health care providers offering appropriate and effective prevention programs.
 8. Promote environmental changes by developing a comprehensive program to increase physical activity including activity in schools, alternatives to car use, community facilities, and work-based physical activity programs.
 9. Partner with public policy-makers to generate public support to fund a statewide Obesity Task Force and its evidence based interventions.
- sponsored and co-sponsored activities and updates.
 6. Assist, facilitate, and adopt the policy and environmental strategies of the Oklahoma Fit Kids Coalition and Actions for Healthy Oklahoma Kids, two grassroots coalitions.
 7. Promote worksites, facilities, and environments that are “baby friendly” to enhance breastfeeding.
 8. Develop a recognition program to promote lactation and “baby friendly” facilities.
 9. Implement “Salad Sister Program” at Omni-plex Museum for nutrition education targeting Oklahoma school-aged children (3-15 years of age).
 10. Collaborate with the Oklahoma Fit Kids Coalition to establish statewide policies related to school nutrition programs that promote heart healthy vending options available to students and faculty.

Nutrition

1. Implement best practices symposium with other professional associations and utilize eHealth technologies for dissemination.
 2. Share with all professions “Brighter Futures” best practices documents, using eHealth technologies.
 3. Partner with all health care profession organizations to increase the awareness and knowledge regarding the obesity epidemic.
 4. Develop marketing materials on best practices in nutrition.
 5. Include best practices on heart health, obesity, nutrition, and physical activity in all Oklahoma State Department of Health
11. Collaborate with local community coalitions and the state restaurant associations to promote “heart-healthy choices”.
 12. Collaborate with all state wide coalitions to develop multiple channels of awareness.

Physical Activity

1. Implement best practices symposium with other professional associations and utilize eHealth technologies for dissemination.
2. Partner with all health care professions organizations to increase the awareness and knowledge about the obesity epidemic.
3. Develop marketing materials on best practices, which focus on reduced television and computer game times for children and youth.
4. Promote communities who develop trails.
5. Include best practices on heart health, obesity, nutrition, and physical activity in all Oklahoma State Department of Health sponsored and co-sponsored activities and updates.
6. Promote worksites, facilities, and environments that are “physical activity friendly”.
7. Expand partnership with “Walk This Weigh Oklahoma” to all 77 counties in Oklahoma.
8. Partner with the Department of Transportation on trail development in Oklahoma.
9. Implement Safe Routes to Schools with public school systems.
10. Partner with Oklahoma Fit Kids Coalition to implement statewide physical fitness testing, and statewide policy on physical activity programs in the schools.
11. Provide technical assistance and materials for Health Advisory Boards on physical activity and nutrition in Oklahoma schools.
12. Promote state policy for 150 minutes of physical activity per week for students K-8.
13. Promote state policy for cardio-strength training for students K-8.

Tobacco

1. Support efforts for all public facilities in Oklahoma to become smoke-free.
2. Support efforts for communities to enforce 24/7 smoke-free policies on school property.
3. Implement Freedom from Smoking: Tobacco Cessation course for Oklahoma State Department of Health state and county health department employees.
4. Market the Tobacco Free Helpline throughout Oklahoma.
5. Support efforts to raise sales tax on cigarettes in Oklahoma.
6. Support the Oklahoma Tobacco Use Prevention Strategic Plan.

Secondary Prevention

High Blood Pressure

Healthy People 2010 Objective 12-11:

Increase the proportion of adults with high blood pressure who are taking action (for example, losing weight, increasing physical activity, reducing sodium intake, or taking medications as directed) to help control their blood pressure.

Healthy People 2010 Target Goal:

95% of adults aged 18 years and older with high blood pressure who are taking action for control.

Healthy People 2010 Objective 12-12:

Increase the proportion of adults who have had their blood pressure measured within the preceding 2 years and can state whether their blood pressure was normal or high.

Oklahoma Program Goals:

- By 2010, decrease the percentage of Oklahoma adults with high blood pressure from 28.3% (BRFSS 2003) to 25%.
- By 2010, increase the percentage of Oklahoma adults with high blood pressure who are eating fewer high fat or high cholesterol foods to lower their risk of developing heart disease or stroke from 70% (2001 BRFSS) to 75%.
- By 2010, increase the percentage of Oklahoma adults with high blood pressure who are becoming more physically active in order

to lower their risk of developing heart disease or stroke from 60.6% (2001 BRFSS) to 65%.

- By 2010, increase the percentage of Oklahoma adults with high blood pressure who are eating more fruits and vegetables in order to lower their risk of developing heart disease or stroke from 82.4% (2001 BRFSS) to 85%.
- By 2010, reduce the percentage of Oklahoma adults who currently smoke from 25% (2003 BRFSS) to 20%.
- By 2010, increase the percentage of Oklahoma adults with high blood who consistently keep blood pressure measurements at 140/90 or below from 23% to 30%.

Recommended Strategies:

1. Implement statewide media campaign to increase awareness of high blood pressure as it relates to obesity as a primary risk factor for heart disease and stroke.
2. Implement “The Heart Truth” campaign targeting women, especially Native American women, in Oklahoma through partnership with the American Heart Association, tribal nations, and women’s organizations.
3. Implement “The Heart Truth” campaign targeting Oklahoma women through partnerships with the American Heart Association and faith-based communities.
4. Implement the American Heart Association “Go Red for Women” campaign, focusing on Oklahoma legislators and women statewide.
5. Promote training tools for accurate blood

pressure measurement to para-professionals and health care providers in Oklahoma, in order to increase accuracy of measurement.

6. Implement training for state health care providers on accurate blood pressure measurement techniques and protocol.
7. Promote American Heart Association “Get with the Guidelines” for heart attack and stroke.
8. Partner with statewide health care providers to implement best practices and chronic care model to increase standards of care as it relates to high blood pressure.
9. Partner with federally funded Primary Care Centers in Oklahoma that are developing cardiovascular collaborative models to increase standards of care as it relates to prevention and control of high blood pressure.

High Blood Cholesterol

Healthy People 2010 Objective 12-14:

Reduce the proportion of adults with high total blood cholesterol levels.

Healthy People 2010 Objective 12-15:

Increase the proportion of adults who have had their blood cholesterol checked within the preceding 5 years.

Oklahoma Program Goals:

- By 2010, reduce the mean total blood cholesterol levels among Oklahoma adults (developmental; data not yet available).

- By 2010, reduce the proportion of adults with high total blood cholesterol levels from 32.2% (2003 BRFSS) to 28%.
- Increase the proportion of adults who have had their blood cholesterol checked within the past year from 71.2% (2003 BRFSS) to 75%.

Recommended Strategies:

1. Implement statewide media campaign to increase awareness of high blood cholesterol as a primary risk factor for heart disease and stroke.
2. Implement “The Heart Truth” campaign targeting women, especially Native American women, in Oklahoma through partnership with the American Heart Association, tribal nations, and women’s organizations.
3. Implement “The Heart Truth” campaign targeting Oklahoma women through partnerships with the American Heart Association and faith-based communities.
4. Implement the American Heart Association “Go Red for Women” campaign, focusing on Oklahoma legislators and women statewide.
5. Promote American Heart Association “Get with the Guidelines” for Heart Attack and Stroke.
6. Partner with statewide health care providers to implement best practices and chronic care model to increase standards of care as it relates to high blood cholesterol.
7. Partner with federally funded Primary Care

Centers that are developing cardiovascular collaborative models to increase standards of care as it relates to prevention and control of high blood cholesterol.

Diabetes

Healthy People 2010 Objective 5-7

Reduce deaths from cardiovascular disease in persons with diabetes.

Healthy People 2010 Objective 5-15

Increase the proportion of adults with diabetes who take aspirin at least 15 times per month.

Oklahoma Program Goals:

- By 2010, reduce deaths from cardiovascular disease in Oklahomans with diabetes (developmental; data on secondary causes of death not available).
- By 2010, increase the percent of adults 35 years and older with diabetes that takes aspirin to decrease their risk of CVD from 52.9% (2001 BRFSS) to 58%.

Recommended Strategies:

1. Promote awareness regarding the 5 A Day messages to prevent and control diabetes as it relates to heart disease and stroke.
2. Implement “The Heart Truth”, “Women on the Move”, and the “Go Red for Women” campaigns to reach Native American women throughout the state of Oklahoma in conjunction with the American Heart Association, tribal agencies, and women’s organizations to

reduce the risk of heart disease and stroke among people with diabetes.

3. Partner with Community Health Centers in Oklahoma to promote prevention and control of diabetes as it relates to heart disease and stroke.
4. Encourage people with diabetes to talk to their health care provider about taking aspirin and controlling blood glucose levels to near normoglycemia to decrease their risk of heart disease and stroke.
5. Partner with American Diabetes Association and other diabetes related coalition to implement common strategies.

Early Recognition Systems

Healthy People 2010 Objective 12-2:

Increase the proportion of adults aged 20 years and older who are aware of the early warning symptoms and signs of a heart attack and the importance of accessing rapid emergency care by calling 9-1-1.

Healthy People 2010 Objective 12-3:

Increase the proportion of eligible patients with heart attacks who receive artery-opening therapy within an hour of symptom onset.

Healthy People 2010 Objective 12-4:

Increase the proportion of adults aged 20 years and older who call 9-1-1 and administer cardiopulmonary resuscitation (CPR) when they witness an out-of-hospital cardiac arrest.

Healthy People 2010 Objective 12-5:

Increase the proportion of eligible persons with witnessed out-of-hospital cardiac arrest who receive their first therapeutic electrical shock within 6 minutes after collapse recognition.

Healthy People 2010 Objective 12-8:

Increase the proportion of adults who are aware of the early warning signs and symptoms of a stroke.

Oklahoma Program Goals:

- Increase the percent of Oklahoma adults who would call 911 immediately if they thought someone was having a heart attack or stroke from 81.9% (2003 BRFSS) to 85%.
- Increase the knowledge of all heart attack symptoms to 93%.
- Increase the knowledge of all stroke symptoms to 90.4%.

Recommended Strategies:

1. Implement the Centers for Disease Control and Prevention's "Making the Business Case for Prevention and Control of Heart Disease and Stroke" in Oklahoma small businesses and state agencies.
2. Partner with Oklahoma Association of Regional Councils of Government to distribute Automated External Defibrillators (AEDs) to rural Oklahoma communities. Work with recipients of the AED devices to educate community on the recognition of signs and symptoms of heart attack and stroke, the

importance of dialing 9-1-1, and training of CRP and AED use.

3. Implement American Heart Association's Speaker's Bureau in Oklahoma to increase knowledge and understanding of heart attack and stroke signs and symptoms and the importance of getting immediate medical attention to reduce death and disability.
4. Develop and implement school-aged appropriate education related to recognition of signs and symptoms of heart attack and stroke, the importance of dialing 9-1-1, and training of CPR and AED use, in conjunction with the Omniplex Museum, the American Heart Association, and Cardiac Science.
5. Partner with Oklahoma Hospital Association, Stroke Centers, Neuroscience Center, and health care professionals to implement cardiovascular "best practices".
6. Partner with American Heart Association to continue Operation Heartbeat and Operation Stroke committees throughout Oklahoma.

Disease Management

Healthy People 2010 Objective 12-6:

Reduce hospitalization of older adults with congestive heart failure as the principal diagnosis.

Healthy People 2010 Objective 12-10:

Increase the proportion of adults with high blood pressure whose blood pressure is under control.

Healthy People 2010 Objective 12-16:

Increase the proportion of persons with coronary heart disease who have their LDL-cholesterol level treated to a goal of less than or equal to 100 mg/dl.

Oklahoma Program Goals:

- Reduce hospitalization of older adults with congestive heart failure as the principal diagnosis in Oklahoma.
- Increase the proportion of Oklahoma adults with high blood pressure whose blood pressure is under control.
- Increase the proportion of Oklahomans with coronary heart disease who have their LDL cholesterol level treated to a goal of less than or equal to 100 mg/dl.

Note: Developmental; data not yet available.

Recommended Strategies:

1. Deliver intervention to individuals with established cardiovascular disease and/or CVD risk factors including, high blood pressure, high cholesterol, diabetes, overweight and obesity, physical inactivity, or smoking while utilizing eHealth technologies.
2. Implement the Centers for Disease Control and Prevention resource “Making the Business Case for Prevention and Control of Heart Disease and Stroke” for Oklahoma small businesses and state agencies.
3. Provide incentives to the Oklahoma State Department of Health state and county employees that are heart healthy.
4. Work with small businesses to reach populations, where they are, to provide benefit of being heart healthy.
5. Provide consistent and frequent communication to businesses on signs and symptoms of heart attack and stroke, the importance of dialing 911, and CPR and AED use.
6. Work with Oklahoma insurance plans to provide coverage incentives for consumers to decrease risks factors associated with heart attack and stroke.
7. Make the business case to Oklahoma State and Education Employee Group Insurance Board to cover cost of INTERxVENT for consumers of Health Choice insurance.
8. Partner with federally funded Primary Care Centers that are developing cardiovascular collaborative models to increase standards of care as it relates to prevention and control of high blood pressure and high blood cholesterol.
9. Partner with American Heart Association to continue Operation Heartbeat and Operation Stroke committees throughout Oklahoma.

Improved Quality of Life And Reduced Burden of Heart Disease and Stroke

Healthy People 2010 Objective 12-1:

Reduce coronary heart disease deaths.

Healthy People 2010 Objective 12-7:

Reduce stroke deaths.

Oklahoma Program Goals:

- By 2010, reduce the age-adjusted mortality rate for ischemic heart disease among Oklahomans from 217.9/100,000 (2002 Vital Statistics) to 200/100,000.
- By 2010, reduce disability due to heart attack among Oklahomans (developmental; data not yet available).
- By 2010, reduce the age-adjusted mortality rate for stroke among Oklahomans from 64.5/100,000 (2002 Vital Statistics) to 60/100,000.
- Reduce disability due to stroke among Oklahomans (developmental; data not yet available).

Recommended Strategies:

1. Increase the number of Oklahomans with high blood pressure who have it under control;
2. Increase the number of Oklahomans with total blood cholesterol less than 200 mg/dl;
3. Increase the number of Oklahomans who know the signs and symptoms of heart attack and

stroke, the risk factors for heart disease and stroke, and the importance of calling 911;

4. Improve emergency response in Oklahoma regarding heart attack and stroke;
5. Improve quality of heart disease and stroke care in Oklahoma; and
6. Eliminate disparities (in terms of race, ethnicity, gender, geography, or socio-economic status).

Data and Surveillance

Oklahoma Program Goals:

- By 2010, establish linkages in order to enhance Oklahoma's current CVD surveillance system.
- By 2010, identify gaps in the current surveillance system and create and implement a plan to address these gaps.
- By 2010, develop and implement a plan for distributing and communicating cardiovascular surveillance information.

Recommended Strategies:

1. Recruit agencies and/or individuals who can provide data that is currently lacking.
2. Annually collect and analyze CVD-related data.
3. Distribute a CVD-related report annually via mail or the internet.

References



1. Centers for Disease Control and Prevention: The Burden of Chronic Diseases and Their Risk Factors: National and State Perspectives, 2004.
2. U.S. Department of Health and Human Services. A Public Health Action Plan to Prevent Heart Disease and Stroke. Atlanta, GA: U.S. Department of Health and Human Services, Center for Disease Control and Prevention, 2003.
3. U.S. Department of Health and Human Services, NIH News, National Institutes of Health, May Is National High Blood Pressure Education Month, May 14, 2003.
4. American Heart Association. Heart Disease and Stroke Statistics—2004 Update. Dallas, Tex: American Heart Association: 2003.
5. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, National High Blood Pressure Education Program, National Heart, Lung, and Blood Institute, National Institutes of Health, U.S. Department of Health and Human Services, December 2003.
6. Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III), Final Report, National Heart, Lung, and Blood Institute, National Institutes of Health, September 2002.
7. The Surgeon General's Call To Action to Prevent and Decrease Overweight and Obesity 2001, U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, 2001.
8. State-Level Estimates of Annual Medical Expenditures Attributable to Obesity, Eric A. Finkelstein and Ian C. Fiebelkorn, RTI International, and Guijing Wang, CDC, Journal on Obesity Research, January 2004.
9. Bursac Z, Campbell J, Yerkes A. Overweight and Obesity in Oklahoma and the US. Chronic Disease Monograph, Winter 2003; 3 No 1.
10. Nutrition and Your Health: Aim for Fitness, Build a Healthy Base, Choose Sensibly...for Good Health, Dietary Guidelines for Americans, U.S. Department of Agriculture, U.S. Department of Health and Human Services, Fifth Edition, 2000.

11. Promoting Better Health For Young People Through Physical Activity and Sports, A Report to the President From the Secretary of Health and Human Services and the Secretary of Education, Fall 2000.

12. U.S. Department of Health and Human Services. Physical Activity and Health: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Chronic Disease Prevention and Promotion, National Center for Centers of Disease Control and Prevention.

13. Centers for Disease Control and Prevention. National Diabetes Fact Sheet: General Information and National Estimates on Diabetes in the United States, 2003. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2003.

14. American Heart Association. Heart Disease and Stroke Statistics — 2004 Update. Dallas, Tex.: American Heart Association; 2003.

*Martin Park Nature Center
Oklahoma City, OK
Photographed by Hannah Comstock*



Appendices



Oklahoma Facts

- The name "Oklahoma" comes from the Choctaw words: "okla" meaning people and "humma" meaning red, so the state's name literally means "red people."
- Oklahoma has the second largest American Indian population of any state. Many of the 252,420 American Indians living in Oklahoma today are descendants from the original 67 tribes inhabiting Indian Territory.
- Thirty-nine of the American Indian tribes currently living in Oklahoma are headquartered in the state.
- The governor of Oklahoma is Brad Henry (took office in January 2003); the lieutenant governor is Mary Fallin.
- Oklahoma's bipartisan state government houses a bicameral legislature.
- Oklahoma has 43 colleges and universities.
- The highest point in the state is Black Mesa in Cimarron County (4,973 feet); the lowest is due east of Idabel in McCurtain County (287 feet).
- Oklahoma has more man-made lakes than any other state, with over one million surface acres of water and 2,000 more miles of shoreline than the Atlantic and Gulf coasts combined.
- Oklahoma is the third largest gas-producing state in the nation.
- Oklahoma ranks fourth in the nation in the production of all wheat, fourth in cattle and calf production, fifth in the production of pecans, sixth in peanuts, and eighth in peaches.
- Oklahoma's four mountain ranges include the Ouachitas, Arbuckles, Wichitas and the Kiamichis.
- Forests cover approximately 24 percent of Oklahoma.
- Oklahoma is bordered by six states: Texas to the south and west, Arkansas and Missouri to the east, Kansas to the north and Colorado and New Mexico at the tip of the northwestern Oklahoma panhandle.
- Oklahoma is comprised of 77 counties.
- Oklahoma has a land area of 69,919 square miles and ranks 18 in the nation in size.
- According to 1990 U.S. census data, Oklahoma's population is 3,258,000. Of those, 82.1 percent are white, 8 percent American Indian, 7.4 percent African American, 2.7 percent Hispanic and 1.1 percent Asian.

- Oklahoma's two most populous cities are Oklahoma City, with 463,201 residents, and Tulsa with 374,851. The next largest cities are Norman, with a population of 87,290 and Lawton, which has 86,028 people.
- The median income level for Oklahoma is \$33,400 compared to \$41,994 nationally.
- The state employees approximately 37,000 Oklahomans and is the largest employer in the state.
- According to the United Health Foundation's 2002 rankings, Oklahoma currently ranks 46th healthiest state in the nation.

*Red Rock Canyon
Hinton, OK
Photographed by Hannah Comstock*





Heart Attack

- **Uncomfortable pressure, fullness, squeezing, or pain in the center of the chest that lasts more than a few minutes.**
- **Pain spreading to the shoulders, neck, or arms.**
- **Chest discomfort with lightheadedness, fainting, sweating, nausea, or shortness of breath.**

Stroke

- **Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body.**
- **Sudden confusion, trouble speaking or understanding.**
- **Sudden trouble seeing in one or both eyes.**
- **Sudden trouble walking, dizziness, loss of balance or coordination.**
- **Sudden severe headache with no known cause.**

Not all of these signs and symptoms occur in every event.

If some occur, get help fast!

Time is very important to reduce the chance of death or disability.

Immediately call 9-1-1 or your local emergency response number.



Reference Card From the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)

EVALUATION

CLASSIFICATION OF BLOOD PRESSURE (BP)*			
CATEGORY	SBP mmHg		DBP mmHg
Normal	<120	and	<80
Prehypertension	120–139	or	80–89
Hypertension, Stage 1	140–159	or	90–99
Hypertension, Stage 2	≥160	or	≥100

* See *Blood Pressure Measurement Techniques* (reverse side)
Key: SBP = systolic blood pressure DBP = diastolic blood pressure

DIAGNOSTIC WORKUP OF HYPERTENSION

- Assess risk factors and comorbidities.
- Reveal identifiable causes of hypertension.
- Assess presence of target organ damage.
- Conduct history and physical examination.
- Obtain laboratory tests: urinalysis, blood glucose, hematocrit and lipid panel, serum potassium, creatinine, and calcium. Optional: urinary albumin/creatinine ratio.
- Obtain electrocardiogram.

ASSESS FOR MAJOR CARDIOVASCULAR DISEASE (CVD) RISK FACTORS

- Hypertension
- Obesity (body mass index ≥ 30 kg/m²)
- Dyslipidemia
- Diabetes mellitus
- Cigarette smoking
- Physical inactivity
- Microalbuminuria, estimated glomerular filtration rate <60 mL/min
- Age (>55 for men, >65 for women)
- Family history of premature CVD (men age <55, women age <65)

ASSESS FOR IDENTIFIABLE CAUSES OF HYPERTENSION

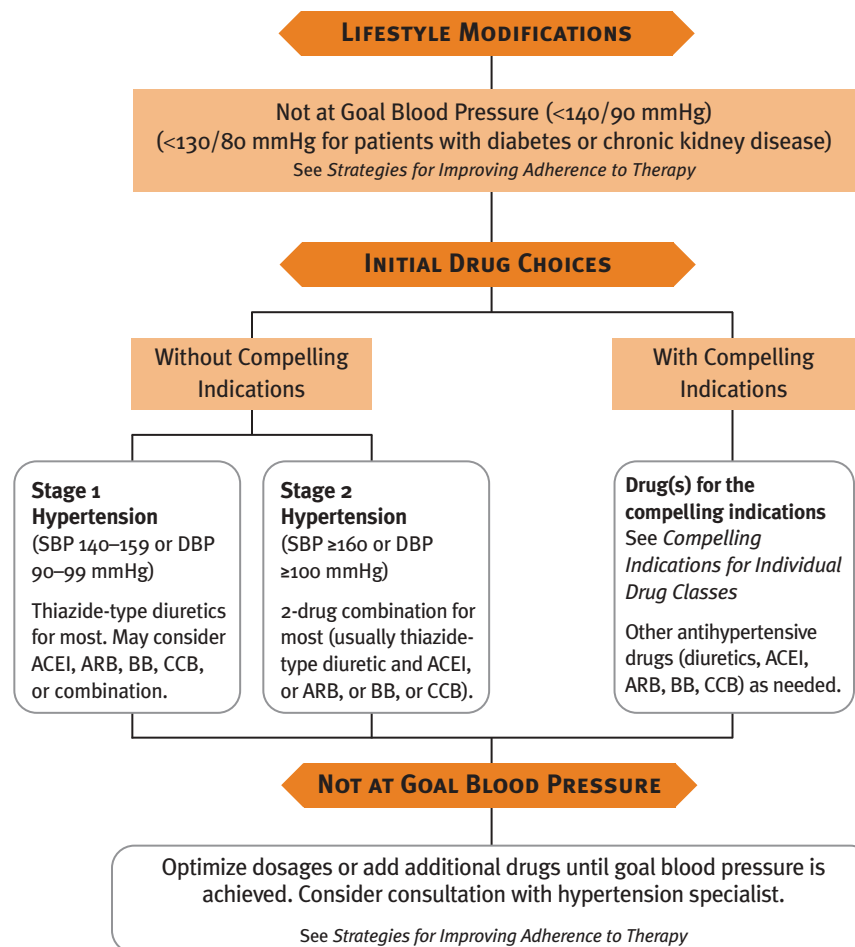
- Sleep apnea
- Drug induced/related
- Chronic kidney disease
- Primary aldosteronism
- Renovascular disease
- Cushing's syndrome or steroid therapy
- Pheochromocytoma
- Coarctation of aorta
- Thyroid/parathyroid disease

TREATMENT

PRINCIPLES OF HYPERTENSION TREATMENT

- Treat to BP <140/90 mmHg or BP <130/80 mmHg in patients with diabetes or chronic kidney disease.
- Majority of patients will require two medications to reach goal.

ALGORITHM FOR TREATMENT OF HYPERTENSION



BLOOD PRESSURE MEASUREMENT TECHNIQUES

METHOD	NOTES
In-office	Two readings, 5 minutes apart, sitting in chair. Confirm elevated reading in contralateral arm.
Ambulatory BP monitoring	Indicated for evaluation of “white coat hypertension.” Absence of 10–20 percent BP decrease during sleep may indicate increased CVD risk.
Patient self-check	Provides information on response to therapy. May help improve adherence to therapy and is useful for evaluating “white coat hypertension.”

CAUSES OF RESISTANT HYPERTENSION

- Improper BP measurement
- Excess sodium intake
- Inadequate diuretic therapy
- Medication
 - Inadequate doses
 - Drug actions and interactions (e.g., nonsteroidal anti-inflammatory drugs (NSAIDs), illicit drugs, sympathomimetics, oral contraceptives)
 - Over-the-counter (OTC) drugs and herbal supplements
- Excess alcohol intake
- Identifiable causes of hypertension (see reverse side)

COMPELLING INDICATIONS FOR INDIVIDUAL DRUG CLASSES

COMPELLING INDICATION	INITIAL THERAPY OPTIONS
• Heart failure	THIAZ, BB, ACEI, ARB, ALDO ANT
• Post myocardial infarction	BB, ACEI, ALDO ANT
• High CVD risk	THIAZ, BB, ACEI, CCB
• Diabetes	THIAZ, BB, ACEI, ARB, CCB
• Chronic kidney disease	ACEI, ARB
• Recurrent stroke prevention	THIAZ, ACEI

Key: THIAZ = thiazide diuretic, ACEI= angiotensin converting enzyme inhibitor, ARB = angiotensin receptor blocker, BB = beta blocker, CCB = calcium channel blocker, ALDO ANT = aldosterone antagonist

STRATEGIES FOR IMPROVING ADHERENCE TO THERAPY

- Clinician empathy increases patient trust, motivation, and adherence to therapy.
- Physicians should consider their patients’ cultural beliefs and individual attitudes in formulating therapy.

The National High Blood Pressure Education Program is coordinated by the National Heart, Lung, and Blood Institute (NHLBI) at the National Institutes of Health. Copies of the JNC 7 Report are available on the NHLBI Web site at <http://www.nhlbi.nih.gov> or from the NHLBI Health Information Center, P.O. Box 30105, Bethesda, MD 20824-0105; Phone: 301-592-8573 or 240-629-3255 (TTY); Fax: 301-592-8563.

PRINCIPLES OF LIFESTYLE MODIFICATION

- Encourage healthy lifestyles for all individuals.
- Prescribe lifestyle modifications for all patients with prehypertension and hypertension.
- Components of lifestyle modifications include weight reduction, DASH eating plan, dietary sodium reduction, aerobic physical activity, and moderation of alcohol consumption.

LIFESTYLE MODIFICATION RECOMMENDATIONS

MODIFICATION	RECOMMENDATION	AVG. SBP REDUCTION RANGE†
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m ²).	5–20 mmHg/10 kg
DASH eating plan	Adopt a diet rich in fruits, vegetables, and lowfat dairy products with reduced content of saturated and total fat.	8–14 mmHg
Dietary sodium reduction	Reduce dietary sodium intake to ≤100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2–8 mmHg
Aerobic physical activity	Regular aerobic physical activity (e.g., brisk walking) at least 30 minutes per day, most days of the week.	4–9 mmHg
Moderation of alcohol consumption	Men: limit to ≤2 drinks* per day. Women and lighter weight persons: limit to ≤1 drink* per day.	2–4 mmHg

* 1 drink = 1/2 oz or 15 mL ethanol (e.g., 12 oz beer, 5 oz wine, 1.5 oz 80-proof whiskey).

† Effects are dose and time dependent.



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
National Heart, Lung, and Blood Institute
National High Blood Pressure Education Program

NIH Publication No. 03-5231

May 2003

ATP III Guidelines At-A-Glance

Quick Desk Reference

1

Step 1

Determine lipoprotein levels—obtain complete lipoprotein profile after 9- to 12-hour fast.

ATP III Classification of LDL, Total, and HDL Cholesterol (mg/dL)

LDL Cholesterol – Primary Target of Therapy

<100	Optimal
100-129	Near optimal/above optimal
130-159	Borderline high
160-189	High
≥190	Very high

Total Cholesterol

<200	Desirable
200-239	Borderline high
≥240	High

HDL Cholesterol

<40	Low
≥60	High

2

Step 2

Identify presence of clinical atherosclerotic disease that confers high risk for coronary heart disease (CHD) events (CHD risk equivalent):

- Clinical CHD
- Symptomatic carotid artery disease
- Peripheral arterial disease
- Abdominal aortic aneurysm.

3

Step 3

Determine presence of major risk factors (other than LDL):

Major Risk Factors (Exclusive of LDL Cholesterol) That Modify LDL Goals

Cigarette smoking

Hypertension (BP ≥140/90 mmHg or on antihypertensive medication)

Low HDL cholesterol (<40 mg/dL)*

Family history of premature CHD (CHD in male first degree relative <55 years; CHD in female first degree relative <65 years)

Age (men ≥45 years; women ≥55 years)

* HDL cholesterol ≥60 mg/dL counts as a “negative” risk factor; its presence removes one risk factor from the total count.

- Note: in ATP III, diabetes is regarded as a CHD risk equivalent.



If 2+ risk factors (other than LDL) are present without CHD or CHD risk equivalent, assess 10-year (short-term) CHD risk (see Framingham tables).

Three levels of 10-year risk:

- >20% — CHD risk equivalent
- 10-20%
- <10%

Determine risk category:

- Establish LDL goal of therapy
- Determine need for therapeutic lifestyle changes (TLC)
- Determine level for drug consideration

LDL Cholesterol Goals and Cutpoints for Therapeutic Lifestyle Changes (TLC) and Drug Therapy in Different Risk Categories.

Risk Category	LDL Goal	LDL Level at Which to Initiate Therapeutic Lifestyle Changes (TLC)	LDL Level at Which to Consider Drug Therapy
CHD or CHD Risk Equivalents (10-year risk >20%)	<100 mg/dL	≥100 mg/dL	≥130 mg/dL (100-129 mg/dL: drug optional)*
2+ Risk Factors (10-year risk ≤20%)	<130 mg/dL	≥130 mg/dL	10-year risk 10-20%: ≥130 mg/dL
			10-year risk <10%: ≥160 mg/dL
0-1 Risk Factor [†]	<160 mg/dL	≥160 mg/dL	≥190 mg/dL (160-189 mg/dL: LDL-lowering drug optional)

* Some authorities recommend use of LDL-lowering drugs in this category if an LDL cholesterol <100 mg/dL cannot be achieved by therapeutic lifestyle changes. Others prefer use of drugs that primarily modify triglycerides and HDL, e.g., nicotinic acid or fibrate. Clinical judgment also may call for deferring drug therapy in this subcategory.

† Almost all people with 0-1 risk factor have a 10-year risk <10%, thus 10-year risk assessment in people with 0-1 risk factor is not necessary.

Initiate therapeutic lifestyle changes (TLC) if LDL is above goal.

TLC Features

- TLC Diet:
 - Saturated fat <7% of calories, cholesterol <200 mg/day
 - Consider increased viscous (soluble) fiber (10-25 g/day) and plant stanols/sterols (2g/day) as therapeutic options to enhance LDL lowering
- Weight management
- Increased physical activity.

Consider adding drug therapy if LDL exceeds levels shown in Step 5 table:

- Consider drug simultaneously with TLC for CHD and CHD equivalents
- Consider adding drug to TLC after 3 months for other risk categories.

Drugs Affecting Lipoprotein Metabolism

Drug Class	Agents and Daily Doses	Lipid/Lipoprotein Effects	Side Effects	Contraindications	
HMG CoA reductase inhibitors (statins)	Lovastatin (20-80 mg)	LDL	↓18-55%	Myopathy Increased liver enzymes	Absolute: • Active or chronic liver disease Relative: • Concomitant use of certain drugs*
	Pravastatin (20-40 mg)	HDL	↑5-15%		
	Simvastatin (20-80 mg)	TG	↓7-30%		
	Fluvastatin (20-80 mg)				
	Atorvastatin (10-80 mg)				
	Cerivastatin (0.4-0.8 mg)				
Bile acid sequestrants	Cholestyramine (4-16 g)	LDL	↓15-30%	Gastrointestinal distress Constipation Decreased absorption of other drugs	Absolute: • dysbeta-lipoproteinemia • TG >400 mg/dL Relative: • TG >200 mg/dL
	Colestipol (5-20 g)	HDL	↑3-5%		
	Colesevelam (2.6-3.8 g)	TG	No change or increase		
Nicotinic acid	Immediate release (crystalline) nicotinic acid (1.5-3 gm), extended release nicotinic acid (Niaspan®) (1-2 g), sustained release nicotinic acid (1-2 g)	LDL	↓5-25%	Flushing Hyperglycemia Hyperuricemia (or gout) Upper GI distress Hepatotoxicity	Absolute: • Chronic liver disease • Severe gout Relative: • Diabetes • Hyperuricemia • Peptic ulcer disease
		HDL	↑15-35%		
		TG	↓20-50%		
Fibric acids	Gemfibrozil (600 mg BID)	LDL	↓5-20%	Dyspepsia Gallstones Myopathy	Absolute: • Severe renal disease • Severe hepatic disease
	Fenofibrate (200 mg)		<i>(may be increased in patients with high TG)</i>		
	Clofibrate (1000 mg BID)	HDL	↑10-20%		
		TG	↓20-50%		

* Cyclosporine, macrolide antibiotics, various anti-fungal agents, and cytochrome P-450 inhibitors (fibrates and niacin should be used with appropriate caution).

Identify metabolic syndrome and treat, if present, after 3 months of TLC.

Clinical Identification of the Metabolic Syndrome – Any 3 of the Following:

Risk Factor	Defining Level
Abdominal obesity*	Waist circumference [†]
Men	>102 cm (>40 in)
Women	>88 cm (>35 in)
Triglycerides	≥150 mg/dL
HDL cholesterol	
Men	<40 mg/dL
Women	<50 mg/dL
Blood pressure	≥130/≥85 mmHg
Fasting glucose	≥110 mg/dL

* Overweight and obesity are associated with insulin resistance and the metabolic syndrome. However, the presence of abdominal obesity is more highly correlated with the metabolic risk factors than is an elevated body mass index (BMI). Therefore, the simple measure of waist circumference is recommended to identify the body weight component of the metabolic syndrome.

† Some male patients can develop multiple metabolic risk factors when the waist circumference is only marginally increased, e.g., 94-102 cm (37-39 in). Such patients may have a strong genetic contribution to insulin resistance. They should benefit from changes in life habits, similarly to men with categorical increases in waist circumference.

Treatment of the metabolic syndrome

- Treat underlying causes (overweight/obesity and physical inactivity):
 - Intensify weight management
 - Increase physical activity.

- Treat lipid and non-lipid risk factors if they persist despite these lifestyle therapies:
 - Treat hypertension
 - Use aspirin for CHD patients to reduce prothrombotic state
 - Treat elevated triglycerides and/or low HDL (as shown in Step 9).

Treat elevated triglycerides.

ATP III Classification of Serum Triglycerides (mg/dL)

<150	Normal
150-199	Borderline high
200-499	High
≥500	Very high

Treatment of elevated triglycerides (≥150 mg/dL)

- Primary aim of therapy is to reach LDL goal
- Intensify weight management
- Increase physical activity
- If triglycerides are ≥200 mg/dL after LDL goal is reached, set secondary goal for non-HDL cholesterol (total – HDL) 30 mg/dL higher than LDL goal.

Comparison of LDL Cholesterol and Non-HDL Cholesterol Goals for Three Risk Categories

Risk Category	LDL Goal (mg/dL)	Non-HDL Goal (mg/dL)
CHD and CHD Risk Equivalent (10-year risk for CHD >20%)	<100	<130
Multiple (2+) Risk Factors and 10-year risk ≤20%	<130	<160
0-1 Risk Factor	<160	<190

If triglycerides 200-499 mg/dL after LDL goal is reached, consider adding drug if needed to reach non-HDL goal:

- intensify therapy with LDL-lowering drug, or
- add nicotinic acid or fibrate to further lower VLDL.

If triglycerides ≥500 mg/dL, first lower triglycerides to prevent pancreatitis:

- very low-fat diet (≤15% of calories from fat)
- weight management and physical activity
- fibrate or nicotinic acid
- when triglycerides <500 mg/dL, turn to LDL-lowering therapy.

Treatment of low HDL cholesterol (<40 mg/dL)

- First reach LDL goal, then:
- Intensify weight management and increase physical activity
- If triglycerides 200-499 mg/dL, achieve non-HDL goal
- If triglycerides <200 mg/dL (isolated low HDL) in CHD or CHD equivalent consider nicotinic acid or fibrate.

Men

Estimate of 10-Year Risk for Men

(Framingham Point Scores)

Age	Points
20-34	-9
35-39	-4
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	11
70-74	12
75-79	13

Total Cholesterol	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
<160	0	0	0	0	0
160-199	4	3	2	1	0
200-239	7	5	3	1	0
240-279	9	6	4	2	1
≥280	11	8	5	3	1

	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
Nonsmoker	0	0	0	0	0
Smoker	8	5	3	1	1

HDL (mg/dL)	Points
≥60	-1
50-59	0
40-49	1
<40	2

Systolic BP (mmHg)	If Untreated	If Treated
<120	0	0
120-129	0	1
130-139	1	2
140-159	1	2
≥160	2	3

Point Total	10-Year Risk %
<0	< 1
0	1
1	1
2	1
3	1
4	1
5	2
6	2
7	3
8	4
9	5
10	6
11	8
12	10
13	12
14	16
15	20
16	25
≥17	≥ 30

10-Year risk _____%

Women

Estimate of 10-Year Risk for Women

(Framingham Point Scores)

Age	Points
20-34	-7
35-39	-3
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	12
70-74	14
75-79	16

Total Cholesterol	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
<160	0	0	0	0	0
160-199	4	3	2	1	1
200-239	8	6	4	2	1
240-279	11	8	5	3	2
≥280	13	10	7	4	2

	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
Nonsmoker	0	0	0	0	0
Smoker	9	7	4	2	1

HDL (mg/dL)	Points
≥60	-1
50-59	0
40-49	1
<40	2

Systolic BP (mmHg)	If Untreated	If Treated
<120	0	0
120-129	1	3
130-139	2	4
140-159	3	5
≥160	4	6

Point Total	10-Year Risk %
< 9	< 1
9	1
10	1
11	1
12	1
13	2
14	2
15	3
16	4
17	5
18	6
19	8
20	11
21	14
22	17
23	22
24	27
≥25	≥ 30

10-Year risk _____%

*For additional information,
please contact:*

Oklahoma Heart Disease and Stroke Health Program

Chronic Disease Service

Oklahoma State Department of Health

1000 N.E. 10th Street

Oklahoma City, OK 73117-1299

Phone: 405-271-4072

Fax: 405-271-6315

<http://www.health.state.ok.us/program/cds/cvd.html>