Two million Americans died from heart disease during WWII – nearly 8 times the number of combat deaths.

By 1948, between one-third and one-half of U.S. deaths were from heart disease.

“There is today almost no certain knowledge of basic causes of, or curative treatments for, many of the varieties of heart disease.”

Quote from the National Heart Institute, 1960.
Before the NHLBI

Franklin Delano Roosevelt dies on April 12, 1945; he had a blood pressure recorded of 260/150.
Death rates from heart disease have fallen since 1950.

About 30 percent reduction for all cardiovascular diseases combined.

Source: New York Times, April 24, 2009
Mission:

Provide global leadership for research, training, and education programs to promote the prevention and treatment of heart, lung, and blood diseases and enhance the health of all individuals so that they can live longer and more fulfilling lives.
NHLBI Goals

1. Improve understanding of the molecular and physiologic basis of health and disease. Use that understanding to develop improved approaches to disease prevention, diagnosis, and treatment.

2. Develop personalized preventive and therapeutic regimens for cardiovascular, lung, and blood diseases.

3. Generate an improved understanding of the processes involved in translating research into practice and use that understanding to enable improvements in public health and to stimulate further scientific discovery.
NHLBI Is the Third Largest NIH Institute

FY 2009 Enacted

NCI $5 B
NIAID $4.7 B
NHLBI $3 B
NIGMS $2 B
NIDDK $1.8 B
President Harry S. Truman signs the National Heart Act, creating the National Heart Institute (NHI):

“…to improve the health of the people of the United States through the conduct of researches [sic] … related to the cause, prevention, and methods of diagnosis and treatment of the diseases of the heart and circulation.”
Framingham Heart Study began in 1948
“Whether or not the correction of these abnormalities once they are discovered will favorably alter the risk of development of disease, while reasonable to contemplate and perhaps attempt, remains to be demonstrated…”

Relationship between blood pressure and stroke in 1 million

Figure 2: Stroke mortality rate in each decade of age versus usual blood pressure at the start of that decade
Rates are plotted on a floating absolute scale, and each square has area inversely proportional to the effective variance of the log mortality rate. For diastolic blood pressure, each age-specific regression line ignores the left-hand point (ie, at slightly less than 75 mm Hg), for which the risk lies significantly above the fitted regression line (as indicated by the broken line below 75 mm Hg).

NHLBI Research to Results: Population Studies

- **NHLBI supports** a set of population-based studies for heart, lung, and blood diseases

- Population studies carefully track health outcomes over many years in large, ethnically diverse groups of people

- Participants’ DNA helps researchers **uncover genetic variants** that correspond to traits of health and disease
Effects of Dietary Patterns and Sodium on Blood Pressure: 

*Dietary Approaches to Stop Hypertension*
Effect of Sodium Level on Systolic Blood Pressure - DASH

Sacks, et al. NEJM 2001;344:3-10
Best Diets Overall

- #1 DASH Diet
- #2 Mediterranean Diet
- Full ranking

Best Weight-Loss Diets

- #1 Weight Watchers
- #2 Jenny Craig
- Full ranking

Best Diabetes Diets

- #1 DASH Diet
- #2 Mayo Clinic Diet
- Full ranking
Heart failure hospitalization rates, 1998-2008, Medicare data

Chen, et al. JAMA 2011
Figure 1. Incident Heart Failure among the White and Black Men and Women in the CARDIA Study.

Kaplan–Meier curves are shown for incident heart failure over the course of 20 years of follow-up in the CARDIA study. P=0.001 for the comparison between black participants and white participants.
Incident heart failure in the Multi-Ethnic Study of Atherosclerosis

Figure 1. Nelson-Aalen plots of cumulative hazards for congestive heart failure (CHF) by racial/ethnic group in the Multi-Ethnic Study of Atherosclerosis.

Trial of Systolic Blood Pressure Reduction

- 9,500 men and women age 50+ yrs
- SBP 130+ and at least 1 additional CVD risk factor, including clinical or subclinical CHD
- Non-diabetic, no prior stroke
- Oversample patients with eGFR<60
- 90 sites from US and Puerto Rico

- Participants will be randomized to a SBP goal of <120 mm Hg (intensive Rx) vs. <140 mm Hg (standard Rx)
- Outcomes include cardiovascular disease, chronic kidney disease, dementia, and cognitive decline
- Results expected in 2017
RFA on Hypertension Control in African Americans

• A set of 5 studies funded in 2004

• Example: A nurse-led intervention providing additional HTN medication review and patient self-management support during the 3-month post-acute care period yielded significant improvements in 3-month BP control, plus improvements in secondary BP outcomes.

Progression of Atherosclerosis throughout life

Childhood -----20’s ------30’s --- 50’s -- 60’s -- 70’s plus -----
Coronary Calcification

Relationship to Clinically Significant Coronary Lesions
and Race, Sex, and Topographic Distribution

By Douglas A. Eggen, Ph.D., Jack P. Strong, M.D.,
and Henry C. McGill, Jr., M.D.

Calcified lesions are the only lesions of atherosclerosis that can be detected in the living patient without significant risk. The

Circulation, Volume XXXII, December 1965
A CT scan of the chest showing coronary artery calcification.
Mean coronary calcification scores in 35,246 men and women, by age

Hoff, et al. AJC 2001
Coronary calcium predicts CHD events, Multi-Ethnic Study of Atherosclerosis

Figure 1. Unadjusted Kaplan–Meier Cumulative-Event Curves for Coronary Events among Participants with Coronary-Artery Calcium Scores of 0, 1 to 100, 101 to 300, and More Than 300.

Panel A shows the rates for major coronary events (myocardial infarction and death from coronary heart disease), and Panel B shows the rates for any coronary event. The differences among all curves are statistically significant (P<0.001).

Clinical Utility of Coronary Calcification Measurement

2010 ACCF/AHA of Cardiovascular
A Report of the Amer Task Force on Pract
Developed in Collaborat
Society of Atherosclerosis
Society of Cardiovascular

PRACTICE GUIDELINES

2.5.10. Computed Tomography for Coronary Calcium

2.5.10.1. RECOMMENDATIONS FOR CALCIUM SCORING METHODS

(SEE SECTION 2.6.1)

CLASS IIa
1. Measurement of CAC is reasonable for cardiovascular risk assessment in asymptomatic adults at intermediate risk (10% to 20% 10-year risk) (18,348). (Level of Evidence: B)

CLASS IIb
1. Measurement of CAC may be reasonable for cardiovascular risk assessment in persons at low to intermediate risk (6% to 10% 10-year risk) (348–350). (Level of Evidence: B)

CLASS III: NO BENEFIT
1. Persons at low risk (<6% 10-year risk) should not undergo CAC measurement for cardiovascular risk assessment (18,348,351). (Level of Evidence: B)
High blood pressure, high cholesterol, diabetes, smoking, obesity, and inactivity increase heart disease risk.

Low-sodium diet prevents and treats high blood pressure.

Maintaining a healthy weight reduces risk of sleep apnea; sleep apnea linked to cardiovascular disease.

Smoking cessation dramatically cuts mortality from lung cancer, heart disease, and lung disease.
NHLBI Research to Results: Educational Campaigns and Programs

- **The Heart Truth®**: National awareness campaign for women about heart disease

- **We Can!®**: (Ways to Enhance Children's Activity & Nutrition): National program to help children stay at a healthy weight

- **Learn More Breathe Better®**: Increase awareness of COPD as a serious lung disease – the 4th leading cause of death in the United States