

## Insights Provided by Framingham Population Research

The Framingham Heart Study (FHS) was initiated in 1949 due to the rising epidemic of coronary disease. “We were charged to determine in what particulars those who go on to develop the disease differ from those who manage to escape it,” describes William B. Kannel, MD, FAHA, Professor of Medicine and Public Health at Boston University and current senior investigator of the FHS. Some of the widely acknowledged major contributions of the study are that it has:

- Proposed the multivariable risk factor concept and its application for risk assessment
- Aroused interest in preventative cardiology
- Established epidemiology as its major science
- Disproved the efficacy of hormone replacement therapy for CVD treatment
- Redefined acceptable values of predisposing risk factors for CVD

In his talk, Dr. Kannel spoke about some of the more recent and often overlooked findings of the FHS.

### Age as a risk factor for CVD

Incidence of CVD has been shown to increase with age. “So what do we do about age,” asks Dr. Kannel, “this is something we cannot change...well... is that true?” Data from the FHS was analyzed to determine the probability of surviving to age 85 by mid-life cardiovascular risk factor status. These data show that if a woman has no risk factors in middle age she has a 65% chance of surviving to age 85, but 3 or more risk factors decreases this probability to 14%. A man with no risk factors at

mid-life has a 37% chance of surviving past age 85, yet only a 2% chance with 3 or more risk factors (Terry DF et al. *J Am Geriatr Soc* 2005; 53:1944). Maybe, then, age *is* a modifiable risk factor, at least with forethought.

### Emerging CVD risk factors

- Total HDL cholesterol ratio is a robust indicator of overall cholesterol trafficking: lower = better
- Elevated systolic pressure and decreased diastolic pressure, or pulse pressure
- Left ventricular hypertrophy (LVH) on an echocardiogram (ECG)
- Diabetes; impact is greater for women than men
- Abdominal obesity
- Spousal aggregation
  - If a man’s wife has coronary disease, he has a 2-fold increased risk and vice versa
- The risk of CVD is directly related to the number of cigarettes smoked per day
  - Risk is unrelated to how long one has smoked
  - Quitting cuts the risk in half compared to those who continue to smoke
  - Smoking, therefore, may play role primarily as a trigger mechanism for the recurrence of MI

Dr. Kannel stresses that this is truly a multivariable disease and when analyzing risk, all factors must be assessed, “The risk [of obesity] is variable depending on the cluster of risk factors, so if there is a patient that can’t lose weight, modify the other risk factors and you modify risk.”

The benefits of the FHS are multifold. Not only has it raised awareness of risk factors, but it has provided the incentive for drug companies to develop good drugs to lower blood pressure, improve lipid profiles and decrease obesity. It is likely that continued analysis of the data from FHS will provide new insights for years to come.