

# CONCEPTS IN HYPERTENSION

A Journal Article-Based Approach to Understanding the Clinical Aspects of Hypertension

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## Article of Interest

Franklin, S et al. Hemodynamic Patterns of Age Related Changes in Blood Pressure: The Framingham Heart Study. *Circulation*. 1997 (Click to Access)

## Context and Study Objective

We assume that "hypertension" implies elevations in both systolic and diastolic blood pressure. The Framingham Heart Study sought to characterize the natural history of systolic and diastolic blood pressure as well as pulse pressure (numerical difference between the systolic and diastolic pressure) with aging.

## Design, Setting, and Participants

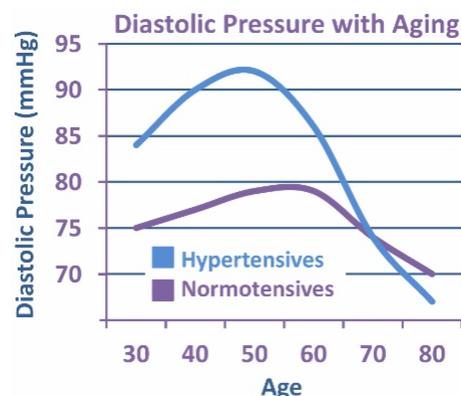
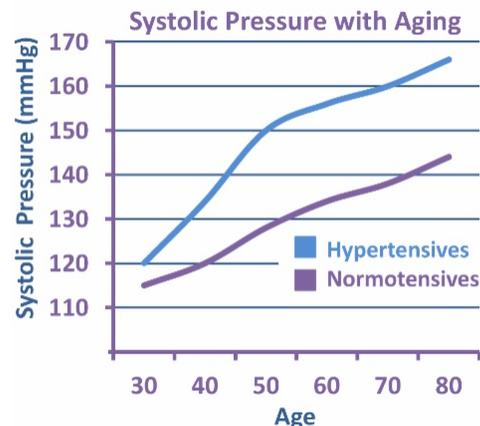
Using a population based cohort from the original Framingham Heart Study (initiated 1948), blood pressure was measured prospectively with individuals stratified as normo- or hypertensive by initial reading. Blood pressure was measured with a mercury sphygmomanometer. Hypertensive patients who were treated prior to study enrollment were excluded.

## Results

-Top Figure: Systolic pressure rises linearly with age in both normotensive and hypertensive individuals. The rate of increase is greater in those with high blood pressure.

-Bottom Figure: Diastolic pressure rises in all individuals until the age of 50-60; it gradually falls thereafter in all persons. The decline is more precipitous among those with hypertension.

-Because hypertensives under 60 experience increases in both systolic and diastolic pressure, the pulse pressure modestly widens (enlarges). With further aging, the drop in diastolic pressure yields a larger pulse pressure.



## Clinical Perspective

-With aging, systolic pressure rises among those consuming a Western diet, even those who are initially normotensive. As such, you can educate your patients that despite everything they are doing to maintain their health, the development of hypertension is almost inevitable.

-Hypertension in those under ages 50-60 is both a systolic and diastolic disease. However, with age, diastolic pressures fall and hypertension becomes exclusively a systolic phenomenon. As such, you shouldn't content yourself with a "controlled" diastolic pressure as low-normal pressures are the norm.

-Given that the rate of rise of systolic pressure is more rapid in hypertensives, it is expected that they will require additional agents with aging, even if their other risk factors are unchanged.

-With falling diastolic pressures, management challenges include lowering systolic pressures while avoiding excessively low diastolic pressures