



# CONCEPTS IN HYPERTENSION

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

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## Article of Interest

Marler, J. et al. Morning Increase in Onset of Ischemic Stroke. Stroke. 1989. (Click to Access)

## Context and Study Objective

Blood pressure is a dynamic parameter fluctuating in a predictable pattern throughout the day. Given that peak pressures occur in the early morning hours, this article sought to characterize a possible relationship between blood pressure, time of day and the onset of stroke.

## Main Outcome

Classification of stroke by time of day.

## Design, Setting, and Participants

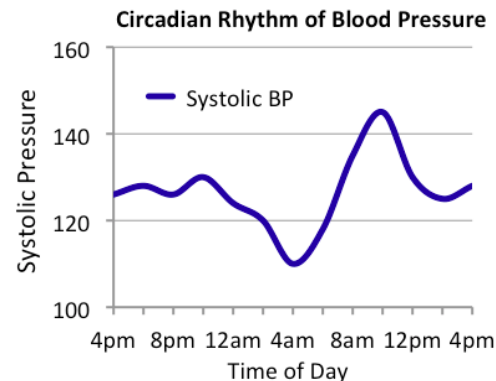
Clinical data collected from the Stroke Data Bank was retrospectively analyzed to determine the time of day of stroke onset. If the patient awoke with a stroke, the "time" of stroke was distributed over the preceding eight hours. No criteria for the diagnosis of stroke were provided. Rather, patients carrying the diagnosis from the stroke database were directly entered into the study.

## Results

-Time of stroke onset was determined for 90% of the 1300 patients identified from the Stroke Data Bank.

-Top Figure: In healthy individuals, changes in BP throughout the day followed a predictable pattern: pressures were lowest in the overnight hours, rose briskly in the morning (5am-11am), and then reached a mean pressure in the afternoon and early evening.

-Bottom Figure: The incidence of stroke rose dramatically during the morning hours and quickly declined thereafter with a nadir in the overnight hours.



## Clinical Perspective

-While the study design and methods are not as rigorous as contemporary protocols, the results are remarkable with similar patterns noted with respect to the timing of myocardial infarction and sudden cardiac death.

-Mechanisms include documented elevations in sympathetic activity (vascular tone and adrenaline) as well as transient increases in platelet aggregation and coagulation parameters during the "morning surge."

-As such, there is consensus that morning pressures are the most important to control; they are both the highest readings of the day and those most tightly linked with cardiovascular events.

-I control morning BP by using long acting agents (chlorthalidone, amlodipine, metoprolol XL) or dosing medications at night ("chronotherapy").

