Hypertension and Brain Health: Setting Limits

National Institute of Neurological Disorders and Stroke
Organizational Update

Katherine Pahigiannis, PhD; Meghan Mott, PhD; Walter Koroshetz, MD

Stroke incidence and mortality have been steadily declining in the United States over the past 2 decades. In the last 5 years, stroke dropped from the third to the fifth leading cause of death in the United States! Experts attribute these trends to better control of risk factors and system-wide improvements in stroke care. Efforts to control hypertension, the most important stroke risk factor, seem to have had the most substantial influence. Given hypertension’s role in the close association between cerebrovascular disease and cognitive impairment and dementia, control of risk factors is likely also contributing to recent declines in the incidence of dementia. Despite this good news, we must remain diligent in our prevention efforts. Overall stroke prevalence is increasing as a result of aging of our population, and racial and ethnic minorities continue to suffer a disproportionate burden of stroke. The CDC estimates that 200,000 stroke deaths each year are preventable.


In 1993, the Fifth Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 5) established the current blood pressure treatment target of 140/90 mm Hg. Adherence to this goal is an important contributor to the reduction of stroke incidence and mortality. The last official JNC report (JNC 7) in 2003 reinforced the JNC 5 targets, recommended a more aggressive approach to detecting and treating hypertension, and introduced the prehypertension designation for levels >120/80 mm Hg. Though an inflection point has been seen for cardiovascular events, most data indicate that stroke rates decrease as blood pressure is lowered. To explore the limits of this benefit, National Institute of Health is now funding SPRINT (http://www.nia.nih.gov/alzheimers/clinical-trials/systolic-blood-pressure-intervention-trial-memory-and-cognition-decreased), a randomized controlled trial of 120 mm Hg versus 140 mm Hg limit, including a substudy of aggressive BP lowering on cognitive change and white matter disease. Given the improving public health data and absence of data showing clear harm, many were surprised by the independent report by James et al1 calling for liberalizing the treatment target for those over 60 years old to 150/90 mm Hg, even in those with cerebrovascular disease.

The report, published in February 2014, did not conform to official clinical practice guidelines because the formal development was discontinued before completion. In June 2013, with the JNC 8 process underway, the National Heart, Lung, and Blood Institute announced a decision to discontinue developing clinical guidelines. The panel appointed to JNC 8 published its recommendations as an independent report, even though the guideline development process was incomplete and the panel was split in its conclusions. There was no public comment period or external review by professional organizations or by the Federal agencies charged with safeguarding the public health, important steps in previous JNC processes and recommended by the Institute of Medicine’s Standards for Developing Trustworthy Clinical Practice Guidelines (http://www.iom.edu/Reports/2011/Clinical-Practice-Guidelines-We-Can-Trust/Standards.aspx). The ACC and AHA, accepting responsibility for the development of cardiovascular prevention guidelines in the post-JNC model presented in Gibbons et al,2 are planning to release updated official hypertension guidelines in 2016. In the meantime, physicians around the country should not assume that the JAMA report reflects the same level of public health relevance as previous JNC guidelines.

The liberalized target of the JNC 8 panel was based predominantly on the absence of randomized control evidence that clearly define optimum limits for those over 60 years old as opposed to the presence of data showing that <140/90 mm Hg is harmful or ineffective. With this purist approach, data from many important stroke studies suggesting benefit of reduced blood pressure levels were dismissed. Five members published their disagreement in Wright et al,3 citing insufficient evidence for the higher target and concerns over increased stroke mortality. Stroke clinical trial data and epidemiological studies suggest that liberalizing the blood pressure limit for treatment in adults between ages 60 and 79 years will increase morbidity and mortality from stroke. The majority of these data, as examined by Gorelick et al4 demonstrate a linear relationship between lowering blood pressure and reduced stroke rates, even in the range below 150 mm Hg. Many stroke experts share the concern that stroke incidence and mortality may increase if higher...
treatment targets are adopted, undermining the progress of recent decades.

**Toward Continued Progress**

The current effort to update hypertension guidelines and the dialogue over optimal treatment targets offers an opportunity to sustain and accelerate the positive trends in stroke incidence and mortality. A comprehensive look at the data in different subgroups with a careful assessment of patient-centered outcomes when weighing the risk/benefit ratio will be crucial. Hypertension guidelines have tremendous impact on public health, and changes to these guidelines need to be motivated by existing data, not lack of data. Working together, we can continue to move in the right direction toward protecting the brain from the ravages of hypertension.

**Disclosures**

None.

---

**References**


---

**Key Words:** cognitive impairment ■ dementia ■ hypertension ■ stroke
Hypertension and Brain Health: Setting Limits: National Institute of Neurological Disorders and Stroke Organizational Update
Katherine Pahigiannis, Meghan Mott and Walter Koroshetz

Stroke. published online April 28, 2015;
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2015 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/early/2015/04/28/STROKEAHA.115.008763.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org//subscriptions/