

# Blood pressure monitoring

September 16 2014, by Margaret Nagle

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(Medical Xpress)—Untreated and sustained hypertension has an adverse effect on brain structure and function, and is a risk factor for cognitive decline and dementia. Blood pressure (BP) variability from measurement-to-measurement has been associated with lower cognitive functioning and is considered a stronger predictor of mental performance than averaged BP.

However, recent studies suggest that BP measurements on a single health care office visit are insufficient to detect relations between variability in BP and [cognitive performance](#), as compared to significantly more expensive ambulatory [blood pressure](#) assessments in the home.

In a new study published in *Hypertension*, a journal of the American Heart Association, a team of University of Maine investigators report that BP assessments during an office visit using an optimal measurement

procedure are sufficient to find relations between blood pressure variability and cognitive performance and function. The UMaine researchers also report that the relation between higher BP variability and cognitive performance is seen only for hypertensive individuals whose blood pressure cannot be reduced to normal levels (140/90 mmHg), despite aggressive treatment and sustained treatment.

Using the Maine-Syracuse Longitudinal Data (MSLS) set, the UMaine study employed 972 community-dwelling women and men who are free from stroke, dementia and kidney disease requiring dialysis (mean age 62 years, range 23-98 years). In cross-sectional analyses, the researchers found variability in BP and averaged BP from 15 BP measurements at a single study visit were related to cognitive function, including measures of overall performance, fluid ability and abstract reasoning ability.

They also found variability in BP was a stronger predictor of cognitive ability than averaged BP, with statistical control for demographic variables, including age, cardiovascular risk factors, and cardiovascular disease.

There were four important new findings in the UMaine study:

- There were no significant relations between variability in BP and cognition with only two assessments at a single occasion.
- Measuring BP values five times in each of three positions—sitting, reclining and standing—resulted in the strongest relations between variability in BP and cognition.
- Variability in diastolic BP was a stronger predictor of cognitive performance than variability in systolic BP.
- These relations were only seen in persons for whom BP could not be reduced to normal levels despite aggressive treatment.

The findings are clinically important because scheduling demands in health care settings and research studies often result in only one or two BP measurements being taken in the sitting position. Including measurements of recumbent and standing BP can increase the information gained about variability in BP, according to the UMaine researchers.

Office visit BP readings can be used as an important preliminary diagnostic tool in terms of future brain injury and cognitive decline at very low cost, compared to more expensive ambulatory BP methods, say the researchers. Further, these findings indicate that the target of concern for relations between variability and cognition are important in treatment-resistant hypertension, where BP is not reduced to acceptable levels.

Research literature suggests that averaged BP values do not capture the beat-to-beat high and low values in BP, which may be more destructive to the brain than high steady-state average pressure on the arterial wall.

Provided by University of Maine

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