Rapid Responses to:

RESEARCH:
Geoffrey A Head, Anastasia S Mihailidou, Karen A Duggan, Lawrence J Beilin, Narelle Berry, Mark A Brown, Alex J Bune, Diane Cowley, John P Chalmers, Peter R C Howe, Jonathan Hodgson, John Ludbrook, Arduino A Mangoni, Barry P McGrath, Mark R Nelson, James E Sharman, Michael Stowasser Ambulatory Blood Pressure Working Group of the High Blood Pressure Research Council of Australia
Definition of ambulatory blood pressure targets for diagnosis and treatment of hypertension in relation to clinic blood pressure: prospective cohort study
BMJ 2010; 340: c1104 [Abstract] [Full text]

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Clinical thresholds for ambulatory blood pressure measurement reinvented?
Jan A. Staessen, Eoin O'Brien, University College Dublin, Dublin, Ireland (30 April 2010)

Clinical thresholds for ambulatory blood pressure measurement reinvented?

30 April 2010

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Send response to journal:

Re: Clinical thresholds for ambulatory blood pressure measurement reinvented?

The Australian study by Head and colleagues1 reiterates aspects of ambulatory blood pressure measurement that were documented over 15 years ago,2 namely: (1) office blood pressure measurements taken by doctors are higher than those obtained by trained staff; (2) the white-coat effect increases with higher levels of clinic blood pressure; (3) for classification of different grades of hypertension thresholds based on the ambulatory blood pressure are lower than those for office blood pressure.

The Australian report fails to acknowledge long-standing recommendations on device validation,3 by using the Suntech Accutracker as one of the devices for measuring ambulatory blood pressure; this device received a C grade for diastolic blood pressure with the British Hypertension Society protocol and is not recommended for clinical practice.4,5 The Australian study included only referred patients and self-selected normotensive subjects recruited by advertisement and has therefore limited application in practice.

Thresholds for ambulatory blood pressure measurement were originally derived from the upper limits of the distribution (means +/- 2 SDs or 95th percentile) in subjects with office normotension.2 The regression approach in the Australian study is a statistical method first applied in the PAMELA study.6 However, using the regression approach ambulatory thresholds were initially set at too low levels, because for the extrapolation of the ambulatory blood pressure at given levels of the office blood pressure the smaller confidence intervals for prediction of the mean ambulatory blood pressure of the population were not differentiated from the wider confidence intervals for the prediction of an individual's ambulatory blood pressure.7 The Australian study1 avoided this problem by reporting only point estimates without confidence intervals, which greatly weakens any statistical conclusions.

It took over 20 years to collect the necessary prospective data to define outcome-driven thresholds.7 The table summarises how evidence influenced the selection of ambulatory thresholds, beginning with those proposed in the BMJ in 2001,9 then moving forward to ambulatory thresholds based on statistical approaches (European Society of Hypertension [ESH] 200310 and 200711 guidelines) and finally arriving at lower thresholds based on the 10-year cardiovascular risk from the International Database on the Ambulatory blood pressure and Cardiovascular Outcomes [IDACO].8

In conclusion, the Australian report,1 which uses an outdated statistical approach and ignores most of the literature published on the subject, concludes by recommending an ambulatory daytime mean threshold of 136/87 mm Hg, but in so doing has failed to recognise that outcome- thresholds are the gold standard for diagnostic criteria.

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and of the European Society of Cardiology (ESC), Mancia G, De Backer G, Dominiczak A, Cifkova R, Fagard R et al. 2007 guidelines for the management of arterial hypertension. Eur Heart J 2007; 28:1462-1536.

TABLE: Thresholds for ambulatory blood pressure measurement

Thresholds for ambulatory blood pressure measurement

Source	Optimal	Normal	Hypertension
BMJ 2001[9]			
24 hours	...	≤130/80	>135/85
daytime	...	≤135/85	>140/90
nighttime	...	≤120/70	>125/75
ESH 2003/2007[10,11]			
awake	<130/80	<135/85	>140/90
asleep	<115/65	<120/70	>125/65
IDACO 2008[8]			
24 hours	<115/75	<125/75	≥130/80
daytime	<120/80	<130/85	≥140/85
nighttime	<100/65	<110/70	≥120/70

Competing interests: None declared