

Are the American Heart Association/American College of Cardiology High Blood Pressure Guidelines Fit for Global Purpose?

Thoughts From the International Society of Hypertension

Neil R. Poulter, Rafael Castillo, Fadi J. Charchar, Markus P. Schlaich, Aletta E. Schutte, Maciej Tomaszewski, Rhian M. Touyz, Ji-Guang Wang

In 2017, the American College of Cardiology (ACC), the American Heart Association (AHA), and 9 other American societies released guidelines for the prevention, detection, evaluation, and management of high blood pressure (BP) in adults.¹

These guidelines are perhaps the most controversial set of US guidelines—even more so than those attributed to some of the committee set up to produce the guidelines of the Eighth Joint National Committee in 2014.²

Before discussing the various controversial aspects of the ACC/AHA guidelines, the International Society of Hypertension would like to congratulate the authors on 3 counts. First, emphasis was placed on the appropriate technique of BP measurements and the increased need for out-of-office BP measurement. Second, the value of risk assessment was recognized and introduced for the first time in US guidelines and finally, perhaps in part because of the controversial nature of the document, awareness of the importance of BP as a global cause of morbidity and mortality has been raised.

The central controversy around which several others arise is the redefining of hypertension—as a systolic BP ≥ 130 mmHg or a diastolic BP ≥ 80 mmHg. Although there is a clear dose-response relationship between increasing BP levels and adverse cardiovascular outcomes,³ this preempts the

ability, based on predicting cardiovascular events, of precisely defining hypertension. However, the pragmatic definition proposed by Geoffrey Rose decades ago should perhaps be considered—viz: “that level of BP above which investigation and management does more good than harm.”⁴ Does the new BP level proposed in the ACC/AHA guidelines fully satisfy that criterion? Perhaps not. To date, the relevant data are inconsistent and hence controversial.

The problem arises because the definition of hypertension, treatment thresholds, and BP targets should be inexorably linked, if we are to be logical about diagnosis and treatment.

It seems likely that the new ACC/AHA definition arose, in large part, from the results of the SPRINT (Systolic Blood Pressure Intervention Trial) trial.⁵ The ACC/AHA authors have apparently modified the systolic BP target of <120 mmHg established as superior in the SPRINT trial, in light of concerns over the method of measurement used⁶ and set a systolic BP of <130 mmHg as the target BP. This makes the setting of the treatment threshold difficult unless target and threshold are to be dissociated. Inevitably, if threshold and target unite, the definition of hypertension follows on as a systolic BP ≥ 130 mmHg.

However, as a multinational society whose role is to present a global perspective, the International Society of Hypertension is concerned at the impact of redefining hypertension in countries around the world—particularly those of low and middle income.

The reality for most of the world is that BP control rates (to <140 mmHg and <90 mmHg) are $<15\%$.⁷ Surely this is not the time to impose a huge increase in hypertension prevalence by redefining it, particularly when the data about optimal targets are inconsistent and hence remain subject to debate.^{8–11}

In an article written before publication of the ACC/AHA guidelines, the International Society of Hypertension provided a global perspective on BP thresholds and targets.¹² We concluded that although the data were (and still are) by no means definitive, in an ideal world, where resources allow, and in the interest of simplicity a systolic target of 130 mmHg could reasonably be set for people with or without diabetes mellitus. However, we acknowledged that thresholds as low as 140 mmHg may be inappropriately low, which is supported by some current guidelines,^{13,14} that recommend that treatment may not be indicated for low-risk patients with a systolic BP <160 mmHg.

Pending more definitive information we think focus should be placed on improving BP awareness¹⁵ and once hypertension is diagnosed, ensuring that effective, low-cost,

The opinions expressed in this editorial are not necessarily those of the editors or of the American Heart Association.

From the Imperial Clinical Trials Unit, Imperial College London, United Kingdom (N.R.P.); Section of Cardiovascular Medicine, Faculty of Medicine, Adventist University of the Philippines and Manila Doctors' Hospital (R.C.); Faculty of Science and Technology, Federation University Australia, Ballarat, Victoria (F.J.C.); Dobney Hypertension Centre, University of Western Australia-Royal Perth Hospital (M.P.S.); Hypertension in Africa Research Team (HART), SAMRC Unit for Hypertension and Cardiovascular Disease, North-West University, Potchefstroom, South Africa (A.E.S.); Division of Cardiovascular Sciences, Faculty of Biology, Medicine and Health, University of Manchester, Manchester University NHS Foundation Trust, Manchester Academic Health Science Centre, United Kingdom (M.T.); Institute of Cardiovascular and Medical Sciences, University of Glasgow, United Kingdom (R.M.T.); and Shanghai Institute of Hypertension, Ruijin Hospital, Shanghai Jiaotong University School of Medicine, China (J.-G.W.).

Correspondence to Neil R. Poulter, Imperial Clinical Trials Unit, Imperial College London, Stadium House, 68 Wood Ln, London W12 7TA, United Kingdom. E-mail n.poulter@imperial.ac.uk

Hypertension. 2018;72:260-262.

DOI: 10.1161/HYPERTENSIONAHA.118.11452.)

© 2018 American Heart Association, Inc.

Hypertension is available at <http://hyper.ahajournals.org>

DOI: 10.1161/HYPERTENSIONAHA.118.11452

evidence-based medicines are available to lower BP to current targets (<140/90 mmHg).^{4,16} Only as resources allow might the systolic target of 130 mmHg be invoked and then possibly only for those at highest cardiovascular risk.

We think that even though the ideal systolic BP target may be 130 mmHg the standard definition of hypertension should not change and to square the circle of having a mismatch between definition and target, those with systolic BPs between 130 and 139 mmHg should be labeled as high normal or prehypertensive (as per the Seventh Joint National Committee guidelines).¹⁷ All such people should receive nonpharmacological advice and as resources allow drug therapy could be initiated for those at highest risk including those with a history of established cardiovascular disease.

The global uptake of the newly proposed hypertension definition seems unlikely and may be inappropriate. Even in the United States, 2 major societies, the American Academy for Family Physicians and the American College of Physicians have raised concerns about potential harm associated with implementing the ACC/AHA guidelines¹⁸ and others have suggested that no likely benefit in terms of cost-efficacy might accrue.¹⁹

Elsewhere around the world, recommended BP levels differed in 8 of 14 comparisons of thresholds and targets for patient subgroups in ACC/AHA versus Canadian guidelines²⁰ and in the Australian National Heart Foundation guidelines²¹ all 11 direct comparisons of thresholds and targets differ from those in the ACC/AHA guidelines. This is not to say that any of these 3 sets of guidelines are correct, but rather to highlight that there is no consensus about these data.

The concerns raised about the new ACC/AHA definition of hypertension and the associated clinical fallout include the dangers of inappropriately labeling people as hypertensive and thereby causing anxiety,²² and overinflated hypertension treatment in low risk younger people (especially women) who get caught up in the newly-enhanced hypertensive population for whom evidence of treatment benefit is not yet established.²³

Other issues that we think reflect the lack of suitability of the ACC/AHA guidelines for exportation to most of the world, include the recommended method of unattended clinic BP measurement which, although it has undoubted benefits, is aspirational in most of the world. In addition, the idea that adults with stage 2 hypertension—hitherto defined as mild or stage 1 hypertension—should be seen within 1 month of diagnosis and at that time receive 2 agents as first-line therapy lacks a robust evidence base. Furthermore, that follow-up for such patients should occur in 1 month after initiating therapy is an unrealistic expectation for the vast majority of the world and, given that most agents—alone or in combination—usually produce maximal BP-lowering effects well after 4 weeks is probably unnecessarily soon.

Summary

On the basis of currently available evidence,

1. We welcome the increased emphasis on out-of-office BP measurement which the ACC/AHA guidelines provide, but advise caution on the reported equivalence levels by type of measurement.

2. We support the use of risk assessment recommended in the ACC/AHA guidelines but note that the levels recommended as defining high risk do not accurately match those used in SPRINT.
3. We welcome the increased awareness about the importance of raised BP which the ACC/AHA guidelines have raised.
4. We suggest that in the global context, the definition of hypertension should remain as systolic BP ≥ 140 mmHg and diastolic BP ≥ 90 mmHg.
5. We think that ideal systolic BP targets for those with or without diabetes mellitus should probably be 130 mmHg. However, people with systolic BP in the range 130 to 139 mmHg should receive nonpharmacological advice, and only where resources allow and for those at high cardiovascular risk should drug therapy be considered for such people.

Disclosures

N.R. Poulter has received financial support from several pharmaceutical companies which manufacture blood pressure-lowering agents, for consultancy fees (Servier), research projects and staff (Servier, Pfizer), and for arranging and speaking at educational meetings (AstraZeneca, LRI-Therapharma, Napi, Servier, and Pfizer). He holds no stocks and shares in any such companies. In the last 2 years, R. Castillo has received speaker's honoraria from Servier, Boehringer Ingelheim, Unilab, LRI-Therapharma, Menarini, and Torrent Pharmaceutical. M.P. Schlaich is supported by an National Health and Medical Research Council Research Fellowship and has received consulting fees, and travel and research support from Medtronic, Abbott, Novartis, Servier, Pfizer, and Boehringer Ingelheim. A.E. Schutte is funded by the South African Medical Research Council and the South African Department of Science and Technology (SARCHI Chair Programme) and received lecture honoraria from Novartis. M. Tomaszewski has received lecture honoraria from Boehringer Ingelheim. R.M. Touyz is funded through a British Heart Foundation grant. The other authors report no conflicts.

References

1. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension*. 2018;71:e13–e115. doi: 10.1161/HYP.0000000000000065.
2. James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. 2014;311:507–520. doi: 10.1001/jama.2013.284427.
3. Lewington S, Clarke R, Qizilbash N, Peto R, Collins R; Prospective Studies Collaboration. Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. *Lancet*. 2002;350:1903–1913. doi: 10.1016/S0140-6736(02)11911-8.
4. Poulter NR, Prabhakaran D, Caulfield M. Seminars in Hypertension. *Lancet*. 2015;386:801–812.
5. Wright JT Jr, Williamson JD, Whelton PK, et al. SPRINT Research Group. A randomized trial of intensive versus standard blood-pressure control. *N Engl J Med*. 2015;373:2103–2116.
6. Kjeldsen S, Mancia G. A critical review of the systolic blood pressure intervention trial (SPRINT). *Euro Heart J*. 2017;38:3260–3265.
7. Chow CK, Teo KK, Rangarajan S, et al; PURE (Prospective Urban Rural Epidemiology) Study Investigators. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. *JAMA*. 2013;310:959–968. doi: 10.1001/jama.2013.184182.
8. Brunström M, Carlberg B. Association of blood pressure lowering with mortality and cardiovascular disease across blood pressure levels: a

- systematic review and meta-analysis. *JAMA Intern Med.* 2018;178:28–36. doi: 10.1001/jamainternmed.2017.6015.
9. Xie X, Atkins E, Lv J, et al. Effects of intensive blood pressure lowering on cardiovascular and renal outcomes: updated systematic review and meta-analysis. *Lancet.* 2016;387:435–443. doi: 10.1016/S0140-6736(15)00805-3.
 10. Ettehad D, Emdin CA, Kiran A, Anderson SG, Callender T, Emberson J, Chalmers J, Rodgers A, Rahimi K. Blood pressure lowering for prevention of cardiovascular disease and death: a systematic review and meta-analysis. *Lancet.* 2016;387:957–967. doi: 10.1016/S0140-6736(15)01225-8.
 11. Lonn EM, Bosch J, López-Jaramillo P, et al; HOPE-3 Investigators. Blood-pressure lowering in intermediate-risk persons without cardiovascular disease. *N Engl J Med.* 2016;374:2009–2020. doi: 10.1056/NEJMoa1600175.
 12. Weber MA, Poulter NR, Schutte AE, Burrell LM, Horiuchi M, Prabhakaran D, Ramirez AJ, Wang JG, Schiffrin EL, Touyz RM. Is it time to reappraise blood pressure thresholds and targets? A statement from the International Society of Hypertension—a global perspective. *Hypertension.* 2016;68:266–268. doi: 10.1161/HYPERTENSIONAHA.116.07818.
 13. Mancia G, Fagard R, Narkiewicz K, et al; Task Force Members. 2013 ESH/ESC Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J Hypertens.* 2013;31:1281–1357. doi: 10.1097/01.hjh.0000431740.32696.cc.
 14. Gabb GM, Mangoni AA, Anderson CS, Cowley D, Dowden JS, Golledge J, Hankey GJ, Howes FS, Leckie L, Perkovic V, Schlaich M, Zwar NA, Medley TL, Arnolda L. Guideline for the diagnosis and management of hypertension in adults - 2016. *Med J Aust.* 2016;205:85–89.
 15. Poulter NR, Lackland DT. May Measurement Month: a global blood pressure screening campaign. *Lancet.* 2017;389:1678–1680. doi: 10.1016/S0140-6736(17)31048-6.
 16. Olsen MH, Angell SY, Asma S, et al. A call to action and a lifecourse strategy to address the global burden of raised blood pressure on current and future generations: the Lancet Commission on hypertension. *Lancet.* 2016;388:2665–2712. doi: 10.1016/S0140-6736(16)31134-5.
 17. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, Jones DW, Materson BJ, Oparil S, Wright JT Jr, Roccella EJ; National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee. Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension.* 2003;42:1206–1252. doi: 10.1161/01.HYP.0000107251.49515.c2.
 18. Bell KJL, Doust J, Glasziou P. Incremental benefits and harms of the 2017 American College of Cardiology/American Heart Association High Blood Pressure Guideline. *JAMA Intern Med.* 2018;178:755–757. doi: 10.1001/jamainternmed.2018.0310.
 19. Vaucher J, Marques-Videl P, Waeber G, Vollenweider P. Population impact of the 2017 ACC/AHA guidelines compared with the 2013 ESH/ESC guidelines for hypertension management. *Eur J Prev Cardiol.* 2018;1:2047487318768938. doi: 10.1177/2047487318768938.
 20. Daskalopoulou SS, Rabi DM, Schiffrin EL, Feldman RD, Padwal RS, Tremblay G, Khan NA; Hypertension Canada. Hypertension Guidelines in the United States and Canada: are we getting closer? *Hypertension.* 2018;71:976–978. doi: 10.1161/HYPERTENSIONAHA.117.10772.
 21. Hoare E, Kingwell BA, Jennings GLR. Blood pressure down under, but down under what? US and Australian Hypertension Guideline Conversation. *Hypertension.* 2018;71:972–975. doi: 10.1161/HYPERTENSIONAHA.118.11026.
 22. Hamer M, Batty GD, Stamatakis E, Kivimaki M. Hypertension awareness and psychological distress. *Hypertension.* 2010;56:547–550. doi: 10.1161/HYPERTENSIONAHA.110.153775.
 23. Tsioufis C, Thomopoulos C, Kreutz R. Treatment thresholds and targets in hypertension: different readings of the same evidence? *Hypertension.* 2018;71:966–968. doi: 10.1161/HYPERTENSIONAHA.118.10815.

Are the American Heart Association/American College of Cardiology High Blood Pressure Guidelines Fit for Global Purpose?: Thoughts From the International Society of Hypertension

Neil R. Poulter, Rafael Castillo, Fadi J. Charchar, Markus P. Schlaich, Aletta E. Schutte, Maciej Tomaszewski, Rhian M. Touyz and Ji-Guang Wang

Hypertension. 2018;72:260-262; originally published online July 2, 2018;

doi: 10.1161/HYPERTENSIONAHA.118.11452

Hypertension is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Copyright © 2018 American Heart Association, Inc. All rights reserved.

Print ISSN: 0194-911X. Online ISSN: 1524-4563

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://hyper.ahajournals.org/content/72/2/260>

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in *Hypertension* 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 *Hypertension* is online at:
<http://hyper.ahajournals.org/subscriptions/>