

# The 2015 M.A.P. checklists for improving BP control



## Measure accurately

### Screening checklist

When *screening* patients for high blood pressure:

- Use a validated, automated device to measure BP<sup>1</sup>
- Use the correct cuff size on a bare arm<sup>2-10</sup>
- Ensure patient is positioned correctly<sup>2,3,11-19</sup>

### Confirmatory checklist

If screening blood pressure is  $\geq 140/90$  mm Hg, obtain a *confirmatory* measurement:

- Repeat *screening* steps above
- Ensure patient has an empty bladder<sup>2,3,20</sup>
- Ensure patient has rested quietly for at least five minutes<sup>2,3,21,22</sup>
- Obtain the average of at least three BP measurements<sup>2,3,23</sup>

### Evidence-based tips for correct positioning

- Ensure patient is seated comfortably with:
  - Back supported
  - Arm supported
  - Cuff at heart level
  - Legs uncrossed
  - Feet flat on the ground or supported by a foot stool
  - No one talking during the measurement

## Act rapidly

If a patient has blood pressure  $\geq 140/90$  mm Hg confirmed:

- Use evidence-based protocol to guide treatment<sup>24-26</sup>
- Re-assess patient every 2-4 weeks until BP is controlled<sup>27-29</sup>
- Whenever possible, prescribe single-pill combination therapy<sup>30-32</sup>

### Evidence-based protocols typically include

- Counsel on and reinforce lifestyle modifications
- Ensure early follow-up and add preferred medications in a step-wise fashion, until BP is controlled
- For most patients, give preference to:
  - Thiazide diuretics
  - *Dihydropyridine* calcium channel blockers
  - ACE inhibitors (ACEI) or
  - Angiotensin receptor blockers (ARB)
- Do not prescribe both ACEI and ARB to same patient
- If BP  $\geq 160/100$  mm Hg, start therapy with two medications or a single pill combination

## Partner with patients, families and communities

To empower patients to control their blood pressure:

- Engage patients using evidence-based communication strategies<sup>33-35</sup>
- Help patients accurately self-measure<sup>36,37</sup>
- Direct patients and families to resources that support medication adherence and healthy lifestyles

### Evidence-based communication strategies include

- Begin with *open-ended questions* about adherence, including recent medication use
- *Explore* reasons for possible non-adherence or a single pill combination
- *Elicit* patient views on options and priorities to customize a care plan for each patient
- Remain *non-judgmental* at all times
- Use *teach-back* to ensure understanding of the care plan

### Evidence-based tips for patient self-measurement of BP

- Instruct patient to measure BP accurately using a validated, automated device and correct positioning for measurement
- Ask patient to record  $\geq 2$  morning BP measurements and  $\geq 2$  evening BP measurements for  $\geq 4$  consecutive days between office visits
- Develop a systematic approach to ensure patients can act rapidly to address elevated BP readings between office visits
- Counsel patients that self-measured BP  $\geq 135/85$  mm Hg is considered elevated

### Evidence-based lifestyle changes to lower BP include

- Following the DASH diet, which is rich in fruits, vegetables and whole grains; low-fat dairy, poultry, fish and plant-based oils; and limits sodium, sweets, sugary drinks, red meat and saturated fats
- Engaging in moderate physical activity, such as brisk walking, for 40 minutes a day at least four days a week
- Maintaining a healthy body mass index (BMI)
- Limiting alcohol to  $\leq 2$  drinks/day in men,  $\leq 1$  drink/day in women

# References

1. Campbell NR, Barbari AE, Cloutier L, et al. Policy statement of the world hypertension league on noninvasive blood pressure measurement devices and blood pressure measurement in the clinical or community setting. *Journal of clinical hypertension*. May 2014;16(5):320-322.
2. O'Brien E, Asmar H, Beilin L, et al. European Society of Hypertension recommendations for conventional, ambulatory and home blood pressure measurement. *Journal of hypertension*. May 2003;21(5):821-848.
3. Pickering TG, Hall JE, Appel LJ, et al. Recommendations for blood pressure measurement in humans and experimental animals: part 1: blood pressure measurement in humans: a statement for professionals from the Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research. *Circulation*. Feb 8 2005;111(5):697-716.
4. van Montfrans GA, van der Hoeven GM, Karemaker JM, Wieling W, Dunning AJ. Accuracy of auscultatory blood pressure measurement with a long cuff. *British medical journal*. Aug 8 1987;295(6594):354-355.
5. Bovet P, Hungerbuhler P, Quilindo J, Gretve ML, Waeber B, Burnand B. Systematic difference between blood pressure readings caused by cuff type. *Hypertension*. Dec 1994;24(6):786-792.
6. Fonseca-Reyes S, de Alba-Garcia JG, Parra-Carrillo JZ, Paczka-Zapata JA. Effect of standard cuff on blood pressure readings in patients with obese arms. How frequent are arms of a 'large circumference'? *Blood pressure monitoring*. Jun 2003;8(3):101-106.
7. Linfors EW, Feussner JR, Blessing CL, Starmer CF, Neelon FA, McKee PA. Spurious hypertension in the obese patient. Effect of sphygmomanometer cuff size on prevalence of hypertension. *Archives of internal medicine*. Jul 1984;144(7):1482-1485.
8. Maxwell MH, Waks AU, Schroth PC, Karam M, Dornfeld LP. Error in blood-pressure measurement due to incorrect cuff size in obese patients. *Lancet*. Jul 3 1982;2(8288):33-36.
9. Nielsen PE, Larsen B, Holstein P, Poulsen HL. Accuracy of auscultatory blood pressure measurements in hypertensive and obese subjects. *Hypertension*. Jan-Feb 1983;5(1):122-127.
10. Russell AE, Wing LM, Smith SA, et al. Optimal size of cuff bladder for indirect measurement of arterial pressure in adults. *Journal of hypertension*. Aug 1989;7(8):607-613.
11. Netea RT, Lenders JW, Smits P, Thien T. Both body and arm position significantly influence blood pressure measurement. *Journal of human hypertension*. Jul 2003;17(7):459-462.
12. Netea RT, Lenders JW, Smits P, Thien T. Influence of body and arm position on blood pressure readings: an overview. *Journal of hypertension*. Feb 2003;21(2):237-241.
13. Netea RT, Elving LD, Lutterman JA, Thien T. Body position and blood pressure measurement in patients with diabetes mellitus. *Journal of internal medicine*. May 2002;251(5):393-399.
14. Mitchell PL, Parlin RW, Blackburn H. Effect of Vertical Displacement of the Arm on Indirect Blood-Pressure Measurement. *The New England journal of medicine*. Jul 9 1964;271:72-74.
15. Netea RT, Lenders JW, Smits P, Thien T. Arm position is important for blood pressure measurement. *Journal of human hypertension*. Feb 1999;13(2):105-109.
16. Adiyaman A, Tosun N, Elving LD, Deinum J, Lenders JW, Thien T. The effect of crossing legs on blood pressure. *Blood pressure monitoring*. Jun 2007;12(3):189-193.
17. Foster-Fitzpatrick L, Ortiz A, Sibilano H, Marcantonio R, Braun LT. The effects of crossed leg on blood pressure measurement. *Nursing research*. Mar-Apr 1999;48(2):105-108.
18. Peters GL, Binder SK, Campbell NR. The effect of crossing legs on blood pressure: a randomized single-blind cross-over study. *Blood pressure monitoring*. Apr 1999;4(2):97-101.
19. Cushman WC, Cooper KM, Horne RA, Meydrech EF. Effect of back support and stethoscope head on seated blood pressure determinations. *American journal of hypertension*. Mar 1990;3(3):240-241.
20. Marx GF, Orkin LR. Overdistention of the urinary bladder during and after anaesthesia. *Canadian Anaesthetists' Society journal*. Sep 1966;13(5):500-504.
21. Campbell NR, McKay DW. Accurate blood pressure measurement: why does it matter? *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. Aug 10 1999;161(3):277-278.
22. Sala C, Santin E, Rescaldani M, Magrini F. How long shall the patient rest before clinic blood pressure measurement? *American journal of hypertension*. Jul 2006;19(7):713-717.
23. Handler J, Zhao Y, Egan BM. Impact of the number of blood pressure measurements on blood pressure classification in US adults: NHANES 1999-2008. *Journal of clinical hypertension*. Nov 2012;14(11):751-759.
24. 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 : the journal of the American Medical Association*. Feb 5 2014;311(5):507-520.
25. Godwin M, Birtwhistle R, Seguin R, et al. Effectiveness of a protocol-based strategy for achieving better blood pressure control in general practice. *Family practice*. Feb 2010;27(1):55-61.
26. Go AS, Bauman MA, Coleman King SM, et al. An effective approach to high blood pressure control: a science advisory from the American Heart Association, the American College of Cardiology, and the Centers for Disease Control and Prevention. *Hypertension*. Apr 2014;63(4):878-885.
27. Mancia G, Fagard R, Narkiewicz K, et al. 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). *Journal of hypertension*. Jul 2013;31(7):1281-1357.
28. Handler J, Lackland DT. Translation of hypertension treatment guidelines into practice: a review of implementation. *Journal of the American Society of Hypertension : JASH*. Jul-Aug 2011;5(4):197-207.
29. Naik AD, Rodriguez E, Rao R, Teinert D, Abraham NS, Kalavar J. Quality improvement initiative for rapid induction of hypertension control in primary care. *Circulation. Cardiovascular quality and outcomes*. Sep 2010;3(5):558-564.
30. Feldman RD, Zou GY, Vandervoort MK, Wong CJ, Nelson SA, Feagan BG. A simplified approach to the treatment of uncomplicated hypertension: a cluster randomized, controlled trial. *Hypertension*. Apr 2009;53(4):646-653.
31. Gradman AH, Basile JN, Carter BL, Bakris GL, American Society of Hypertension Writing G. Combination therapy in hypertension. *Journal of clinical hypertension*. Mar 2011;13(3):146-154.
32. Jamerson K, Weber MA, Bakris GL, et al. Benazepril plus amlodipine or hydrochlorothiazide for hypertension in high-risk patients. *The New England journal of medicine*. Dec 4 2008;359(23):2417-2428.
33. Cooper LA, Roter DL, Carson KA, et al. A randomized trial to improve patient-centered care and hypertension control in underserved primary care patients. *Journal of general internal medicine*. Nov 2011;26(11):1297-1304.
34. Ogedegbe G, Chaplin W, Schoenthaler A, et al. A practice-based trial of motivational interviewing and adherence in hypertensive African Americans. *American journal of hypertension*. Oct 2008;21(10):1137-1143.
35. Schillinger D, Piette J, Grumbach K, et al. Closing the loop: physician communication with diabetic patients who have low health literacy. *Archives of internal medicine*. Jan 13 2003;163(1):83-90.
36. Agarwal R, Bills JE, Hecht TJ, Light RP. Role of home blood pressure monitoring in overcoming therapeutic inertia and improving hypertension control: a systematic review and meta-analysis. *Hypertension*. Jan 2011;57(1):29-38.
37. Uhlig K, Patel K, Ip S, Kitsios GD, Balk EM. Self-measured blood pressure monitoring in the management of hypertension: a systematic review and meta-analysis. *Annals of internal medicine*. Aug 6 2013;159(3):185-194.