

**Poster: Controlling High Blood Pressure Quality Improvement Project**

Heather M. Tatusko

Otterbein University

N7550: Leadership in the FNP role

R. Pruskinski & E. Smith

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**Abstract**

High blood pressure (HBP), also known as Hypertension (HTN), is a common diagnosis for primary care office visits in the United States; however, a persistent gap remains between the stated public health targets and achieved blood pressure (BP) control rates in the United States (US). In a small sample of patients with essential HTN (ICD 10: I10) receiving primary care at a mid-western Federally Qualified Health Center (FQHC), a chart audit tool revealed 10 out of 10 patients achieved BP control during the measurement period (defined as a BP reading <140/90). Quality improvement (QI) analysis revealed the bigger picture: Achieved BP control rates of patients does not reflect the 2017 American College of Cardiology/American Heart Association HBP guidelines. Additionally, the author found potential care gaps for patients in elevated BP (120-129/>80; n=34) and Stage 1 HTN (130-139/80-89; n=44) categories (who according to the measure, were classified as having adequate BP control). A growing body of evidence suggests that looking at cardiovascular disease (CVD) risk and BP level to guide treatment is more efficient and cost-effective than looking at BP level alone, and if we are to achieve optimal BP control rates in the US, harmonization of stated public health targets and implementation of standardized measures in practice is a critical next step.

*Keywords:* hypertension management, blood pressure control, quality improvement, patient-centered measure, practitioner-performance measure, outcome measure



# Controlling High Blood Pressure QI Project

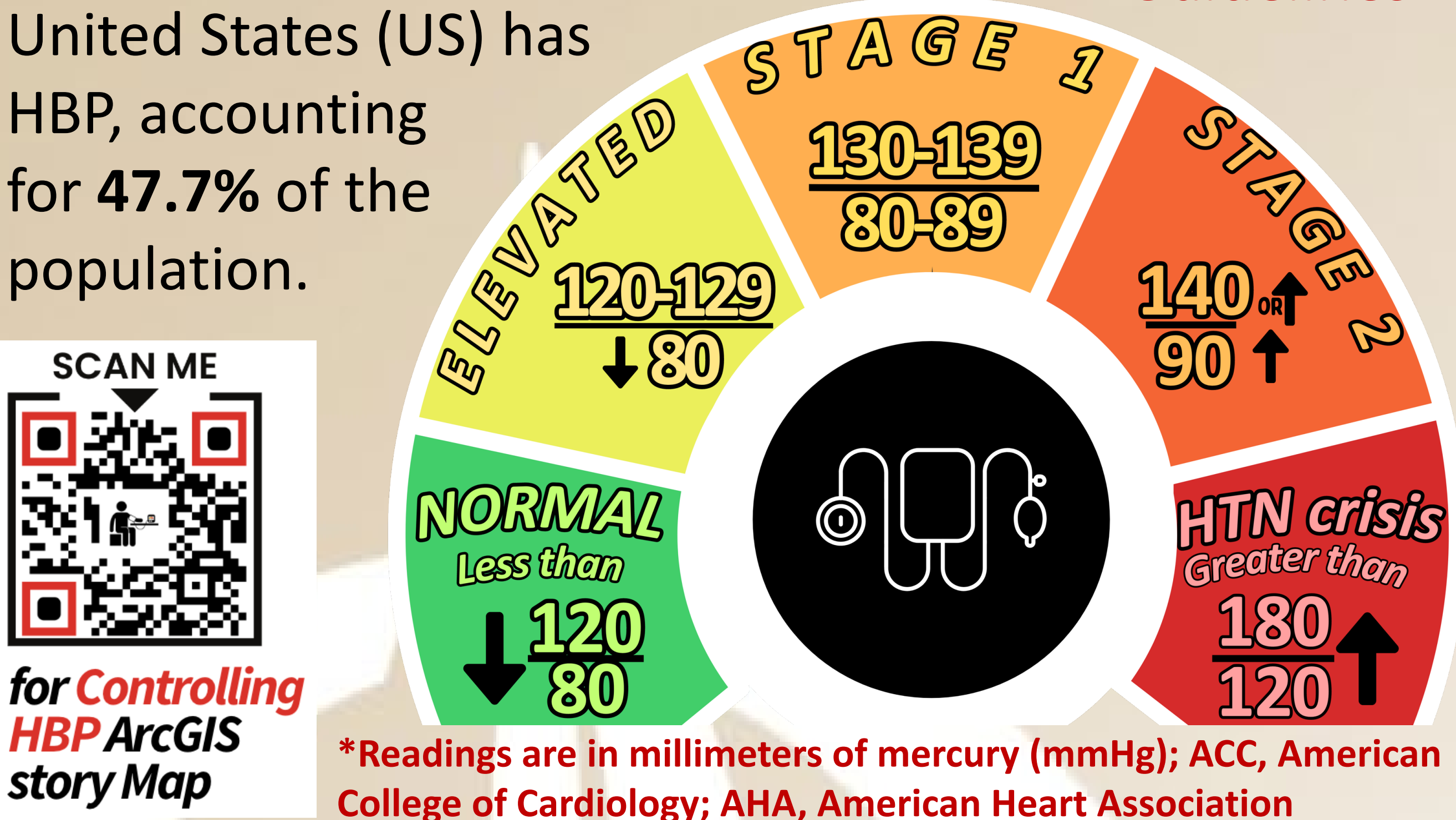
Heather M. Tatusko, MSN, FNP

Otterbein University, Westerville, Ohio

## The Problem: Controlling HBP

- High Blood Pressure (HBP) is also known as hypertension (HTN), and the terms will be used interchangeably to describe the problem.
- When the 2017 HTN guidelines are applied, one in two Adults (ages  $\geq 20$  years) living in the United States (US) has HBP, accounting for 47.7% of the population.
- HTN is the number one diagnosis for primary care office visits, but a persistent gap remains between the stated public health targets and achieved BP control rates (Choudhry et al., 2022).

Figure. 2017 ACC/AHA Guidelines\*



## Methods

- The HBP QI project took place at a Federally Qualified Health Center in Franklin County, Ohio.
  - The Controlling HBP QI project falls under the Donabedian Category of Health Outcome.
  - A Chart Audit Tool was developed based on the Centers for Medicare and Medicaid Services (CMS) 165v10 (HTN Controlling HBP).
- Measure Definition:** Patients ages 18-85 years with active HTN diagnosis (ICD10: I10) starting before and continuing into or starting during the first six months of the measurement period and whose most recent BP during the measurement period was adequately controlled.
- See Table for inclusion/exclusion criteria.
  - SQUIRE 2.0 guidelines for reporting utilized.

Table. Controlling High Blood Pressure Chart Audit Tool

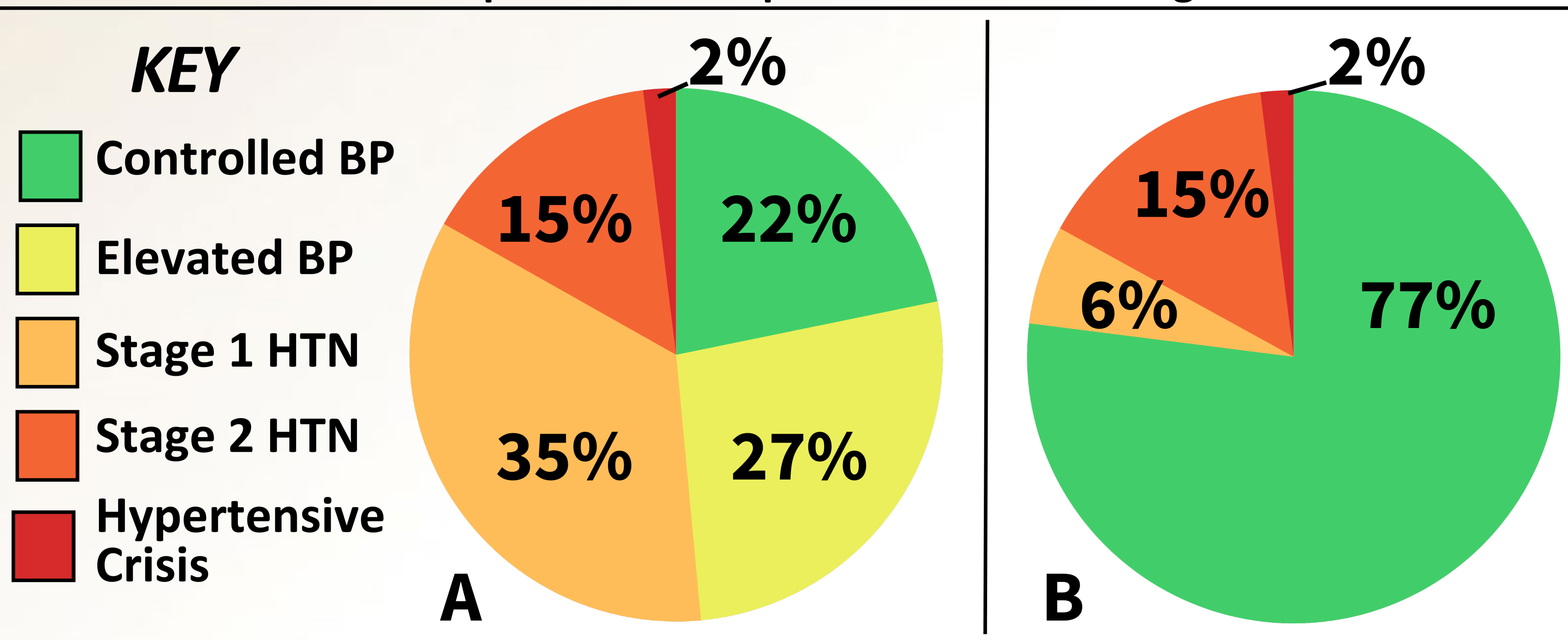
### INCLUSION CRITERIA

- Patients 18-85 years of age
  - Most recent systolic blood pressure in measurement period  $< 140$  mmHg
  - Most recent diastolic blood pressure in measurement period  $< 90$  mmHg
  - Active diagnosis of essential HTN (ICD-10: I10)
- ### EXCLUSION CRITERIA
- Active Pregnancy during the measurement period
  - End Stage Renal Disease before or during the measurement period
  - Chronic Kidney Disease, Stage 5 before or during the measurement period
  - Dialysis, Kidney Transplant recipient before or during the measurement period
  - Hospice Care at any point in the measurement period
  - Age  $\geq 65$  and  $< 81$  at start of period, AND the following Evidence of frailty overlapping the measurement period, AND the following in the two years before the end of the measurement period:  $> 1$  outpatient visit with a diagnosis of Advanced Illness OR Active medication for dementia, Age  $> 80$  at start of period, and evidence of frailty overlapping the measurement period.

Note. Measurement period: April 19 to September 19, 2022; Data collection method: Blood pressure measurement obtained in office or using approved electronic device with data transfer to provider office using lowest systolic bp (SBP) and lowest diastolic bp (DBP). Based on CMS 165v10 (Hypertension Controlling High Blood Pressure ).

## Results

Numerator  $\rightarrow n=104$  Denominator  $\rightarrow n=125$   
83% of patients had bp controlled according to the measure



A. Patient outcomes with 2017 ACC/AHA BP guidelines applied (follow-up BP goal  $< 130$  and elevated bp category); B. Patient outcomes with JNC 7 (NHLBI, 2004) BP guidelines applied (follow-up BP goal  $< 140$ , the current standard used for measure)

## Conclusion

- According to the measure, 83% of patients met the follow-up BP goal (16.8% did not meet goal).
- In a random sample of patients, audit tool revealed 10 out of 10 patients achieved BP control (defined as  $\leq 140/90$ ) at follow-up during the measurement period.
- The bigger picture revealed that the 2017 ACC/AHA BP guidelines are not being used, so patients with elevated BP may be overlooked when implementing interventions.

### Results Continued...

125 patients (n=125) fit the measure after exclusions. 21 patients (n=21) did not meet follow-up BP goal (defined as  $\leq 140/90$ ).

#### Results per 2017 guidelines:

- Normal: 17.6% (n=22)
- Elevated: 26.4% (n=33)
- Stage 1: 42.4% (n=53)
- Stage 2: 15.2% (n=19)
- HTN Crisis: 1.6% (n=2)
- Exclusions: Active pregnancy (n=1); prior kidney transplant (n=1); frailty criteria met (n=2).
- 171/101 and 181/123
- DBP readings stayed below 99 mmHg excluding the two above readings.
- DBP 91-99 mmHg (n=5).

## Limitations

- Small sample size (n=10) of chart audit.
- Time-limited nature of clinical experience restricted data collection to one QI cycle.
- BP control (defined as  $\leq 140/90$ ) does not capture patients with elevated BP (SBP 120-129) or stage 1 HTN (according to 2017 ACA/AHA HBP guidelines).
- Lastly, there are multiple confounding variables with BP measurement.

## HBP Management

- The relationship between the measure (control of HTN) and long-term clinical outcomes is well established (National Committee on Quality Assurance).
- Key drivers include standardized treatment protocol and treatment intensification (Bretter et al., 2022; Choudhry et al. 2022).



## Recommendations

- Calculate cardiovascular disease (CVD) risk on all patients with elevated and HBP.
- Looking at CVD risk and BP level to guide treatment is more efficient and cost effective at reducing CVD risk compared to use of BP level alone (Brettler et al. 2022).
- Future HBP QI projects should look at proportion of patients being treated for HBP with high CVD risk, Diabetes (DM), and/or Chronic Kidney Disease and BP control.

## Professional Handout & References





# Professional Resource Handout

H. Tatusko, Otterbein Graduate Nursing, Spring 2023

## Take Aways for Healthcare Professionals

- Use [ASCVD-Risk-Estimator](#) to guide BP threshold for patient drug therapy.
- HBP management *key drivers* include use of a **standardized treatment protocol** and **treatment intensification** as seen in figure below. Scan QR codes (click on icon if viewing from phone) for more resources/references for controlling HBP.

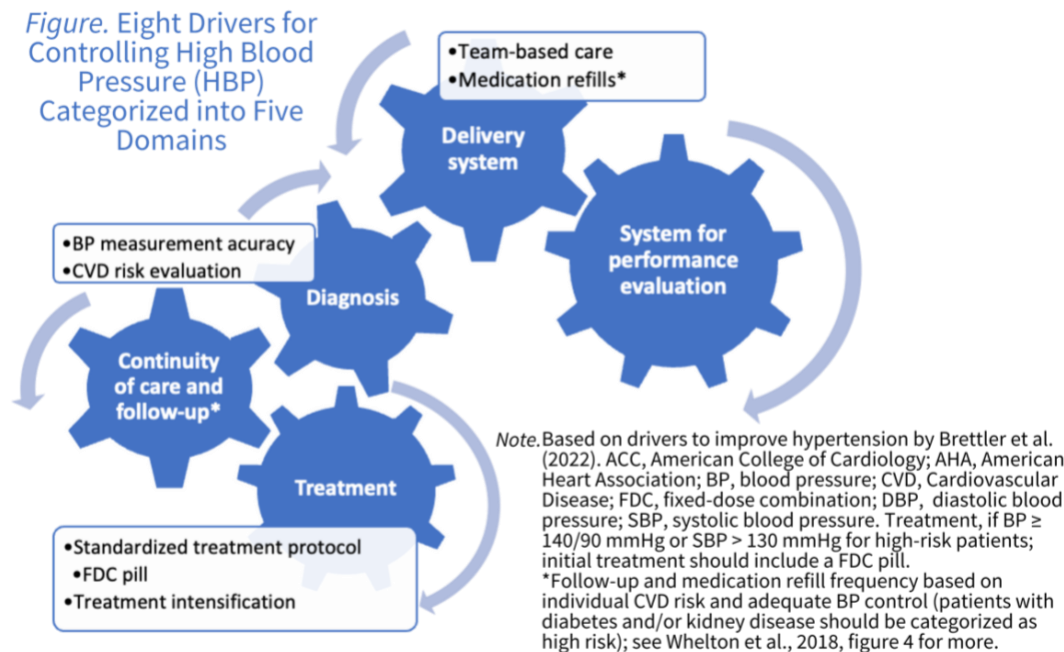


Table 1. Controlling High Blood Pressure/Hypertension Management Evidence-Based Protocols	
CDC HBP Protocol	Centers for Disease Control and Prevention. (2023, January 6). Hypertension treatment protocols. <i>Million hearts</i> ®. <a href="https://millionhearts.hhs.gov/tools-protocols/protocols.html#http">https://millionhearts.hhs.gov/tools-protocols/protocols.html#http</a>
AHA HBP Protocol	Egan, B. M., Sutherland, S. E., Rakotz, M., Yang, J., Hanlin, R., Davis, R. A., & Wozniak, G. (2018). Improving hypertension control in primary care with the measure accurately, act rapidly, and partner with patients protocol. <i>Hypertension</i> , 72(6), 1320–1327. <a href="https://doi.org/10.1161/hypertensionaha.118.11558">https://doi.org/10.1161/hypertensionaha.118.11558</a>
VA HBP Guidelines & Protocol	Department of Veteran Affairs & US Department of Defense. (2020, March). Diagnosis and management of hypertension (HTN) in primary care. VA/DoD clinical practice guidelines. <a href="https://www.healthquality.va.gov/guidelines/cd/htn/">https://www.healthquality.va.gov/guidelines/cd/htn/</a>

Table 2. 2017 American college of Cardiology (ACC)/American Heart Association (AHA) Guidelines			
BP Category	SBP		DBP
Normal	<120	and	<80 mm Hg
Elevated	120–129	and	<80 mm Hg
HTN Stage 1	130–139	or	80–89 mm Hg
HTN Stage 2	$\geq 140$	or	$\geq 90$ mm Hg
HTN Crisis	$\geq 180$	or	$\geq 120$ mm Hg

BP, blood pressure; DBP, diastolic blood pressure; SBP, systolic blood pressure; HTN, hypertension; measurements are in mm Hg and based on an average of  $\geq 2$  careful readings obtained on  $\geq 2$  occasions, as detailed in Section 4 of Whelton et al. (2018); Individuals with SBP and DBP in 2 categories should be designated to the higher BP category.

Table 3. Patient Results when the 2017 ACC/AHA Guidelines are Applied		
BP Category	Proportion	Number
Normal	17.59 %	n=22
Elevated	26.4 %	n=33
HTN Stage 1	42.4 %	n=53
HTN Stage 2	15.2 %	n=19
HTN Crisis	1.56 %	n=2

Total number of patients at the FQHC fit the measurement criteria after exclusions, n=125; Measurement period: April 19 to September 19, 2022; Data collection method: Blood pressure measurement obtained in office or using approved electronic device with data transfer to provider office based on CMS 165v10 (Hypertension Controlling High Blood Pressure; see eCQM technical specifications for more details).

## References

- American College of Cardiology. (2023). *ASCVD Risk Estimator Plus*. ACC. <https://www.acc.org/tools-and-practice-support/mobile-resources/features/2013-prevention-guidelines-ascvd-risk-estimator>
- American Heart Association & American Medical Association. (2018, November 16). *Bp treatment algorithm*. Target:BP. <https://targetbp.org/blood-pressure-improvement-program/bp-treatment-algorithm-tool/>
- Ayanian, J. Z., & Markel, H. (2016). Donabedian's lasting framework for health care quality. *New England Journal of Medicine*, 375(3), 205–207. <https://doi.org/10.1056/nejmp1605101>
- Brettler, J. W., Arcila, G., Aumala, T., Best, A., Campbell, N., Cyr, S., Gamarra, A., Jaffe, M. G., la Rosa, M., Maldonado, J., Ojeda, C., Haughton, M., Malcolm, T., Perez, V., Rodriguez, G., Rosende, A., González, Y., Wood, P. W., Zúñiga, E., & Ordunez, P. (2022). Drivers and scorecards to improve hypertension control in primary care practice: Recommendations from the hearts in the americas innovation group. *The Lancet Regional Health - Americas*, 9, 100223. <https://doi.org/10.1016/j.lana.2022.100223>
- Casey, D. E., Daniel, D. M., Bhatt, J., Carey, R. M., Commodore-Mensah, Y., Holmes, A., Smith, A. P., Wozniak, G., & Wright, J. T. (2022). Controlling high blood pressure. *American Journal of Medical Quality*, 37(1), 22–31. <https://doi.org/10.1097/01.jmq.0000749856.90491.43>
- Casey, D. E., Thomas, R. J., Bhalla, V., Commodore-Mensah, Y., Heidenreich, P. A., Kolte, D., Muntner, P., Smith, S. C., Spertus, J. A., Windle, J. R., Wozniak, G. D., & Ziaeian, B. (2019). 2019 aha/acc clinical performance and quality measures for adults with high blood pressure: A report of the american college of cardiology/american heart association task force on performance measures. *Circulation: Cardiovascular Quality and Outcomes*, 12(e000057), 1–48. <https://doi.org/10.1161/hcq.0000000000000057>

- Centers for Disease Control and Prevention. (2023, January 6). Hypertension treatment protocols. *Million hearts*®. <https://millionhearts.hhs.gov/tools-protocols/protocols.html#http>
- Centers for Disease Control and Prevention. (2013). *Protocol for Controlling Hypertension in Adults*. CDC. <https://millionhearts.hhs.gov/files/Hypertension-Protocol.pdf>
- Choudhry, N. K., Kronish, I. M., Vongpatanasin, W., Ferdinand, K. C., Pavlik, V. N., Egan, B. M., Schoenthaler, A., Houston Miller, N., & Hyman, D. J. (2022). Medication adherence and blood pressure control: A scientific statement from the american heart association. *Hypertension*, 79(1). <https://doi.org/10.1161/hyp.000000000000203>
- Donabedian, A. (1966). Evaluating the quality of medical care. *The Milbank Memorial Fund Quarterly*, 44(3), 166–206. <https://doi.org/10.2307/3348969>
- Egan, B. M., Sutherland, S. E., Rakotz, M., Yang, J., Hanlin, R., Davis, R. A., & Wozniak, G. (2018). Improving hypertension control in primary care with the measure accurately, act rapidly, and partner with patients protocol. *Hypertension*, 72(6), 1320–1327. <https://doi.org/10.1161/hypertensionaha.118.11558>
- Goodman, D., Ogrinc, G., Davies, L., Baker, G., Barnsteiner, J., Foster, T. C., Gali, K., Hilden, J., Horwitz, L., Kaplan, H. C., Leis, J., Matulis, J. C., Michie, S., Miltner, R., Neily, J., Nelson, W. A., Niedner, M., Oliver, B., Rutman, L.,...Thor, J. (2016). Explanation and elaboration of the squire (standards for quality improvement reporting excellence) guidelines, v.2.0: Examples of squire elements in the healthcare improvement literature. *BMJ Quality & Safety*, 25(12), e7–e7. <https://doi.org/10.1136/bmjqs-2015-004480>
- Fryar, C. D., Ostchega, Y., Hales, C. M., Zhang, G., & Kruszon-Moran, D. (2017). *Hypertension prevalence and control among adults: United States (2015-2016)* [NCHS data brief, no 289]. National Center for Health Statistics, Hyattsville, MD.

- The National Heart, Lung, and Blood Institute [NHLBI]. (2004). *The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure* (NIH publication no. 04–5230). National Institute of Health. <https://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full>
- Office of Disease Prevention & Health Promotion & US Department of Health and Human Services. (2021). Increase control of high blood pressure in adults (Healthy people 2030, HDS-05). HHS. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/heart-disease-and-stroke/increase-control-high-blood-pressure-adults-hds-05>
- Kirkland, E. B., Heincelman, M., Bishu, K. G., Schumann, S. O., Schreiner, A., Axon, R., Mauldin, P. D., & Moran, W. P. (2018). Trends in healthcare expenditures among us adults with hypertension: National estimates, 2003–2014. *Journal of the American Heart Association*, 7(11). <https://doi.org/10.1161/jaha.118.008731>
- Lewis, C. L., Chrastil, H. J., Schorr-Ratzlaff, W., Lam, H., McCord, M., Williams, L., Drake, L., Kozloski, M., Lebduka, E., & Dashiell-Earp, C. (2020). Achieving 70% hypertension control: How hard can it be? *The Joint Commission Journal on Quality and Patient Safety*, 46(6), 335–341. <https://doi.org/10.1016/j.jcjq.2020.04.002>
- MacLaughlin, E. J., Slaton, J. F., & DePalma, S. M. (2018). Blood pressure targets: How low should you go (and for whom)? *The Journal of Family Practice*, 67(7), 416–425. <https://cdn.mdedge.com/files/s3fs-public/Document/June-2018/JFP06707416.PDF>
- Mancia, G., De Backer, G., Dominiczak, A., Cifkova, R., Fagard, R., Germano, G., Grassi, G., Heagerty, A. M., Kjeldsen, S. E., Laurent, S., Narkiewicz, K., Ruilope, L., Rynkiewicz, A., Schmieder, R. E., Boudier, H., & Zanchetti, A. (2007). 2007 guidelines for the management of arterial hypertension. *Journal of Hypertension*, 25(6), 1105–1187. <https://doi.org/10.1097/hjh.0b013e3281fc975a>

National Center for Health Statistics. (2018). *Crude percentages of hypertension for adults aged 18 and over, united states, 2015-2018*. (National Health Interview Survey, 2015-2018) [generated interactively April 22, 2023]. NCHS. <https://www.cdc.gov/nchs/nhis/ADULTS/www/index.htm>

National Committee for Quality Assurance. (2022). *Controlling high blood pressure (eCQM 165)* [html]. eCQI resource center. <https://ecqi.healthit.gov/sites/default/files/ecqm/measures/CMS165v10.html#d1e405>

Reboussin, D. M., Allen, N. B., Griswold, M. E., Guallar, E., Hong, Y., Lackland, D. T., Miller, E. R., Polonsky, T., Thompson-Paul, A. M., & Vupputuri, S. (2018). Systematic review for the 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. *Circulation*, 138(17). <https://doi.org/10.1161/cir.0000000000000601>

Tatusko, H. M. (2023, March 13). *High blood pressure management quality improvement project*. ArcGIS StoryMaps. <https://storymaps.arcgis.com/stories/745af914089f469bae3fc16b12a91b10>

Whelton, P. K., Carey, R. M., Mancia, G., Kreutz, R., Bundy, J. D., & Williams, B. (2022). Harmonization of the american college of cardiology/american heart association and european society of cardiology/european society of hypertension blood pressure/hypertension guidelines. *European Heart Journal*, 43(35), 3302-3311. <https://doi.org/10.1093/eurheartj/ehac432>

Whelton PK, Carey RM, Aronow WS, et al. (2018). 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. *J Am Coll Cardiol*;71:e127-e248.