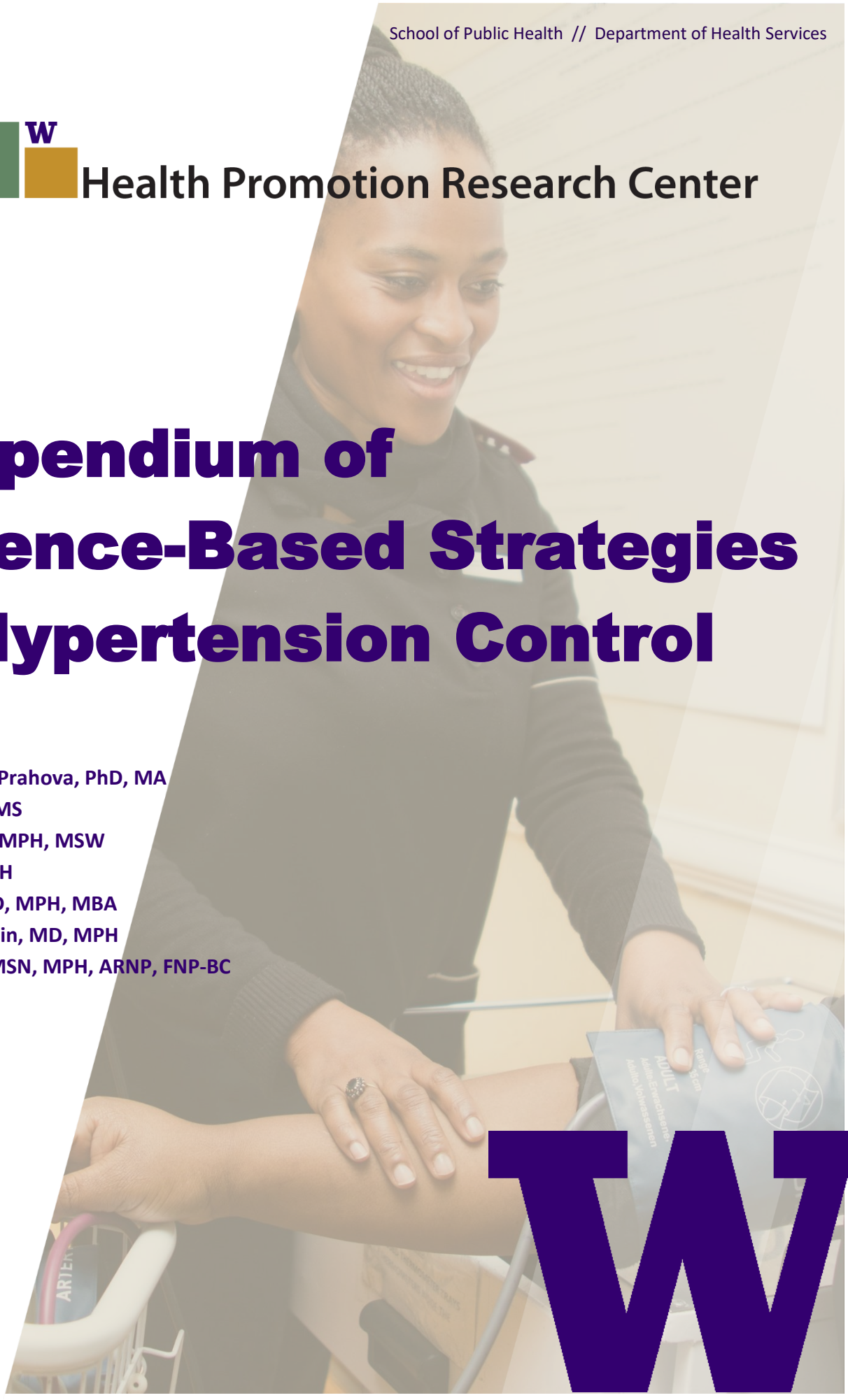
School of Public Health // Department of Health Services

Health Promotion Research Center

Compendium of Evidence-Based Strategies for Hypertension Control



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PREVENTION RESEARCH CENTERS

INTRODUCTION

Hypertension (or high blood pressure) is diagnosed in persons with blood pressure measurements consistently 140/90 mm Hg or higher.[1] Based on this definition, approximately 121.5 million adults in the United States (or about 48% of the population) have hypertension, a major risk factor for developing and dying from cardiovascular disease and stroke.[2] Effective control of hypertension with medications and lifestyle approaches can significantly reduce the risk of cardiovascular diseases, yet nearly half of persons with hypertension have uncontrolled hypertension.[3] With the potential to affect more than 90% of persons during their lifetimes,[1] adequate control of hypertension is of significant public health importance.[4]

To support local health jurisdictions in addressing hypertension in their communities, we have identified 4 pathways through which they can promote hypertension control and improve patient outcomes: clinical systems, community pharmacists, community health workers, and community organizations (Figure 1). In this compendium, we summarize evidence-based practices – both clinical and non-clinical – that can be implemented in each of the pathways to increase hypertension awareness, treatment and control.

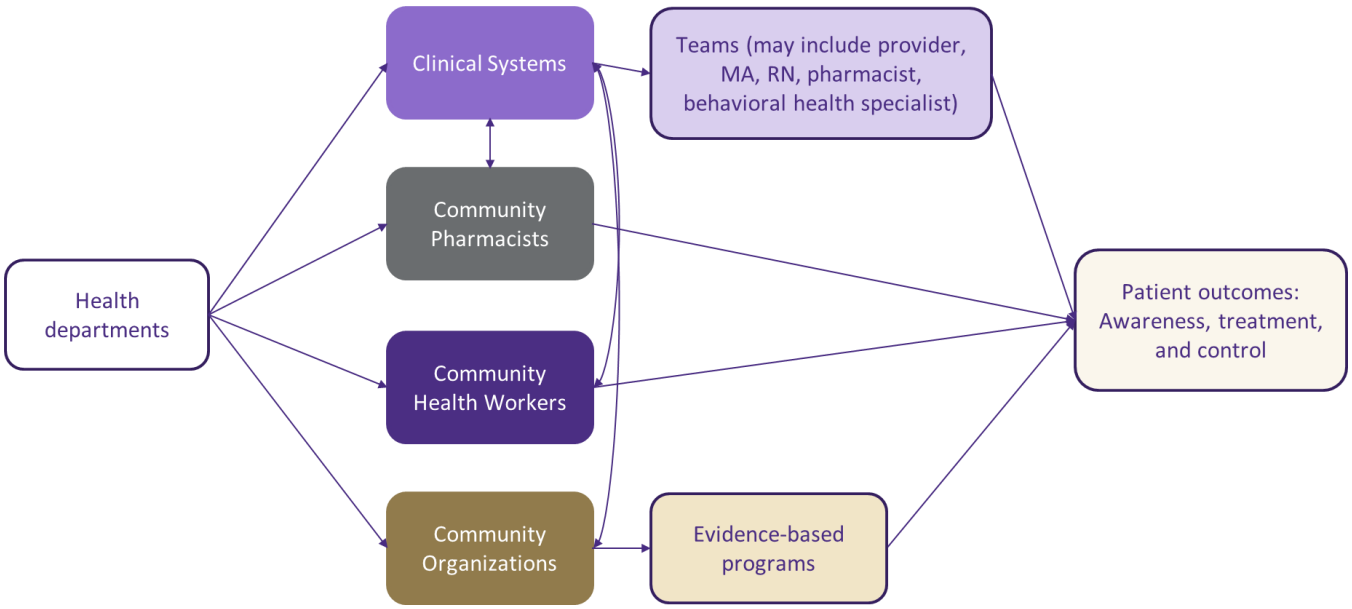

Figure 1 – Logic model: Pathways for health departments to promote hypertension control through evidence-based interventions

[1] Centers for Disease Control and Prevention. High Blood Pressure Symptoms and Causes. 2021. https://www.cdc.gov/bloodpressure/about.htm Last accessed on February 18, 2021.

[2] On behalf of the American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics—2021 Update: A Report From the American Heart Association. *Circulation*. 2021, Jan 27; 143(9): e00-e00. https://doi.org/10.1661/CIR.0000000000000950.

[3] Institute for Health Metrics and Evaluation (IHME). *US Health Map*. Seattle, WA: IHME, University of Washington, 2014. Available at: http://www.healthdata.org/data-visualization/us-health-map Last accessed on October 5, 2020.

[4] Wang TJ, Vasan RS. Epidemiology of uncontrolled hypertension in the United States. Circulation. 2005 Sep 13;112(11):1651-62.

THE PATHWAYS IN CONTEXT

In this compendium, we summarize evidence-based practices that can be implemented for each of the pathways to increase hypertension awareness, treatment and control. While we present strategies within their respective pathways, we encourage readers to take a systemic perspective while selecting and implementing strategies. Each pathway interacts with the others in the greater context of each community. Oftentimes, more than one strategy can (and perhaps should) be implemented to achieve hypertension control. Strong examples of comprehensive, multi-pathway interventions include Million Hearts Key Foundations and a five-step program implemented by Kaiser Permanente in California. Utilizing community-linkages is also an effective strategy for system-level engagement when addressing public health issues.[5] A hypertension-specific example of this multisectoral engagement is highlighted in ASTHO's Community Linkages issue brief and toolkit.

EVIDENCE-BASED STRATEGIES INCLUDED IN THIS COMPENDIUM

List of Acronyms Used in this Compendium

ACC: American College of Cardiology
AHA: American Heart Association
AAPA: American Academy of PAs
ACPM: American College of Preventive Medicine
AGS: American Geriatrics Society
APhA: American Pharmacists Association
ASH: American Society of Hematology
ASPC: American Society of Preventive Cardiology
ASTHO: Association of State and Territorial Health Officials
NACHC: National Association of Community Health Centers
NMA: National Medical Association
PCNA: Preventive Cardiovascular Nurses Association
BP: Blood pressure
CVD: Cardiovascular disease
PA: Physician's Assistant
SMBP: Self-measured blood pressure

[5] DeSalvo KB, Wang YC, Harris A, Auerbach J, and Koo D, O'Carroll P. Public Health 3.0: A Call to Action for Public Health to Meet the Challenges of the 21st Century. Prev Chronic Dis 2017;14:170017. DOI: http://dx.doi.org/10.5888/pcd14.170017.

1. CLINICAL SYSTEMS

Local health jurisdictions can promote evidence-based practices related to identification of patients with undiagnosed hypertension, implementing standardized hypertension treatment protocols, increasing engagement of non-physician team members, and increasing use of self-measured blood pressure (SMBP) monitoring with clinical support. Clinics often utilize a systemic perspective when engaging in quality improvement and practice transformation activities, and therefore may be able to implement multiple strategies at a time.

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Promote the creation of registries to manage panels of patients and track indicators	Quality improvement programs should include five major components: 1. Health system-wide hypertension registry 2. Reports of hypertension control rates 3. Development of an evidence-based practice guideline 4. Medical assistant visits for follow-up measurements 5. Promotion of single-pill combination (SPC) therapy	Leveraging Clinical Data for Public Health and Hypertension Surveillance Million Hearts Undiagnosed Hypertension Toolkit From 70 to 80 Percent: A hypertension management toolkit	Kaiser Permanente Northern California National Association of Community Health Centers Partnership Shows Quick Hypertension Control Returns Benefis Medical Group, Great Falls, Montana
Promote the use of standardized hypertension treatment protocols to improve the treatment and control of hypertension in clinical settings	Recommended Elements of Effective Hypertension Protocols: • Clarity and simplicity • Lifestyle modification • Treatment by stage of hypertension • Time interval to titration and reassessment • Use of low-cost 1st-line treatment • Exclusions and suggestions for medications based on concurrent medical conditions • Recommended lab tests • Reminder of the underlying causes of non-essential or secondary hypertension • Adherence-enhancing approaches such as fixed dose and/or combination drugs • Indications for referral to hypertensive specialist • Number needed to treat to avoid a clinical event • Supporting references • Congruent with current guidelines, including JNC-8	2017 ACC, AHA, AAPA, ACPM, AGS, APhA, ASH, ASPC, NMA, PCNA: Guideline for the Prevention of High Blood Pressure in Adults 2017 ACC Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: Guidelines Made Simple Million Hearts Hypertension Control Change Package 2nd Edition Million Hearts Protocol Resources	Veterans Administration (VA) Kaiser Permanente (KP) AMA Hypertension Medication Treatment Protocol 04-2019 2017 Guideline for High Blood Pressure in Adults ACC 5-7-2018

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Promote the use of Clinical Decision-Support Systems (CDSS)	CDSS are computer-based information systems designed to assist healthcare providers in implementing clinical guidelines at the point of care. CDSS use patient data to provide tailored patient assessments and evidence-based treatment recommendations for healthcare providers to consider. Patient information is entered manually or automatically through an electronic health record (EHR) system. May include: ○ Reminders for overdue CVD preventive services ○ Assessments of patients' risk for developing CVD ○ Recommendations for evidence-based treatments to prevent CVD ○ Recommendations for health behavior changes ○ Alerts when indicators for CVD risk factors are not at goal	Community Guide to Preventive Services: CDSS Task Force Finding and Rationale Statement (2014) (includes Considerations for Implementation) Community Guide CDSS One-Page Overview Bright et al. (2012) provides a series of features of a successful CDSS	Redwood Community Health Coalition (RCHC): RCHC Hypertension Management Guideline JNC-8 & RCHC Hypertension Clinical Decision Support (CDS) Package v.1
Promote the use of team-based care to improve blood pressure control	• Team members who most often worked with patients and primary care providers were **clinical pharmacists and nurses.** • Medication management roles for team members were implemented in **three different ways**. Team members could: 1. Change medications independent of the primary care provider 2. Change medications with primary care provider approval or consultation 3. Provide only adherence support and hypertension-related information, with no direct influence on prescribed medications	Community Guide to Preventive Services: Team Based Care Task Force Finding and Rationale Statement (includes Considerations for Implementation) Community Guide Team-Based Care One-Page Overview "Improving Patient and Health System Outcomes through Advanced Pharmacy Practice" 2011 "Partnering with Pharmacists in the Prevention and Control of Chronic Diseases" [1]	The Maryland P3 Program of the Center for Innovative Pharmacy Solutions (CIPS) (Patients, Pharmacists, Partnerships) Program Contact: cips@rx.umaryland.edu The South Carolina Stroke Belt Project 1997 Twenty years of Progress Toward Understanding the Stroke Belt - AHA Stroke, 2020 Clinical Implementation of Self-Measured Blood Pressure Monitoring, 2015-2016

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Promote self-measured blood pressure (SMBP) monitoring with additional support	Self-measured blood pressure monitoring interventions combined with additional support include one or more of the following: ○ **One-on-one patient counseling** on medications and health behavior changes (e.g., diet and exercise); ○ **Educational sessions** on high blood pressure and blood pressure self-management; and/or ○ **Access to electronic or web-based tools** (e.g., electronic requests for medication refills, text or email reminders to measure blood pressure or attend appointments, direct communications with healthcare providers via secure messaging). Self-measured blood pressure monitoring interventions are often **used with team-based care.**	Community Guide to Preventive Services: Self-Measured Blood Pressure Monitoring Interventions for Improved Blood Pressure Control – When Combined with Additional Support Self-Measured Blood Pressure Monitoring at Home: A Joint Policy Statement From the American Heart Association and American Medical Association June 2020 Million Hearts Action Guides for Clinicians and Public Health Professionals AHA Target:BP SMBP Implementation Guide NACHC Health Care Delivery SMBP Implementation Guide CDC Self-Measured Blood Pressure Monitoring with Clinical Support	Community Health Centers funded by the National Association of Community Health Centers to implement SMBP Ochsner Health System's Hypertension Digital Medicine Self-Measured Blood Pressure Monitoring: Program Planning, Implementation, and Lessons Learned From 5 Federally Qualified Health Centers in Hawai'i 2020 AHA Check. Change. Control.® Program NACHC CHI: Making Self-Measured Blood Pressure Monitoring Work in Your Health Center: Lessons from the Field webinar
Promote self-measured blood pressure (SMBP) monitoring used alone	Patients are trained to use validated, and usually automated, blood pressure measurement devices on a regular basis in familiar settings, typically their homes. Patients share blood pressure readings with their healthcare providers during clinic visits, by telephone, or electronically. These measurements are monitored and used in treatment decisions to improve blood pressure control.	Community Guide to Preventive Services: Self-Measured Blood Pressure Monitoring Interventions for Improved Blood Pressure Control – When Used Alone	The Target:BP Initiative US Blood Pressure Validated Device Listing

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Telehealth resources for self-measured blood pressure (SMBP)	Patients are trained to use validated, and usually automated, blood pressure measurement devices on a regular basis in familiar settings, typically their homes. Patients share blood pressure readings with their healthcare providers by telephone or electronically. These measurements are monitored and used in treatment decisions to improve blood pressure control.	Million Hearts Action Guides for Clinicians and Public Health Professionals AHA Target:BP SMBP Implementation Guide NACHC Health Care Delivery SMBP Implementation Guide NACHC Promising Health Center Practices COVID-19 Fall 2020	Lanai Community Health Center Uses Telehealth Technology to Support SMBP 2018 HIMSS Davies Award PPT: SMBP Lana`i Community Health Center December 2017 Examples noted in the NACHC Promising Health Center Practices COVID-19 Fall 2020 • At-Home Care
Promote mobile health interventions for treatment adherence among newly diagnosed patients	Mobile devices such as mobile-phones, smartphones, or other hand-held devices deliver self-management guidance to patients who have recently been diagnosed with cardiovascular disease. Mobile health interventions may include text-message reminders, information, and motivation. Some mobile interventions have an interactive component and/or mobile communication with providers.	Community Guide to Preventive Services: Mobile Health (mHealth) Interventions for Treatment Adherence among Newly Diagnosed Patients The Office of the National Coordinator for Health Information Technology: Patient Engagement Playbook – Chapter 5	

Articles – Clinical Systems

On behalf of the American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics—2021 Update: A Report From the American Heart Association. *Circulation*. 2021, Jan 27; 143(9): e00-e00.

Bartolome RE, Chen A, Handler J, Platt ST, Gould B. Population Care Management and Team-Based Approach to Reduce Racial Disparities among African Americans/Blacks with Hypertension. *Perm J*. 2016;20(1):53-9.

Bright TJ, Wong A, Dhurjati R, Bristow E, Bastian L, et al. Effect of clinical decision-support systems: a systematic review. *Ann Intern Med.* 2012; 157(1):29-43.

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Jaffe MG, Lee GA, Young JD, Sidney S, Go AS. Improved blood pressure control associated with a large-scale hypertension program. *JAMA*. 2013;310(7):699-705.

Mills KT, Obst KM, Shen W, Molina S, Zhang H, He H, et al. Comparative Effectiveness of Implementation Strategies for Blood Pressure Control in Hypertensive Patients: A Systematic Review and Meta-analysis. *Ann Intern Med*. 2018;168:110–120.

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Patel P, Ordunez P, Dipette D, et al. Improved Blood Pressure Control to Reduce Cardiovascular Disease Morbidity and Mortality: The Standardized Hypertension Treatment and Prevention Project. *The Journal of Clinical Hypertension*. 2016;18(12):1284-1294.

2. COMMUNITY PHARMACISTS

The distinction between clinical pharmacists and community pharmacists[6] is one of roles rather than actual location of practice. For the purposes of this compendium, we consider clinical pharmacists to be the ones who are officially part of a care team, and do medication management or consult with the physician.[7] As such, they are included in the clinical systems interventions above. In contrast, community pharmacists are pharmacists who focus on BP monitoring, medication adherence and lifestyle modifications regardless of whether they are part of a clinical system or a community-based pharmacy such as Walgreens.[7] Local health jurisdictions can work with the Washington State Pharmacy Association and the representatives of local and national pharmacy chains to engage pharmacists in hypertension control.

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Engage community pharmacists to promote medication and self-management	Take BP when patients pick up prescriptions, assess medication adherence, provide hypertension/lifestyle counseling ("patient consultation services")	Reference those listed in the Clinical Systems section of the Compendium Morrison et al. 2012 WHO CINDI Creating Community-Clinical Linkages Between Community Pharmacists and Physicians ASTHO Community-Clinical Linkages Change Package Toolkit Using the Pharmacists' Patient Care Process to Manage High Blood Pressure Linking with Community Pharmacists to Improve Hypertension Management	The Asheville Project, Asheville, NC Program Contact: info@aphafoundation.org Know Your Blood Pressure, Wegmans Food Markets, MD, MA, NJ, NY, PA, VA Pharmacy-Based Health Promotion Program, Quebec City, Canada Cardiovascular Risk Management by Community Pharmacists, IA Contact: William Doucette William-doucette@uiowa.edu University of Michigan College of Pharmacy linking Patient Centered Medical Home (PCMH) & Community Pharmacy Sarah Vordenberg, PharmD MPH skelling@med.umich.edu Million Hearts Case Study: Oklahoma, Pittsburg County, Oklahoma The Montana Pharmacist Blood Pressure Management Program

[6] American Pharmacists Association. Community-Based Pharmacy Practice - Community-based Pharmacist Practitioners. 2021. https://www.pharmacist.com/community-based-pharmacy-practice#:~:text=Community%2Dbased%20pharmacist%20practitioners%20are,in%20any%20community%2Dbased%20setting.&text=Serving%20as%20leaders%20within%20community,within%20the%20profession%20of%20pharmacy Last accessed on February 18, 2021.

[7] Morrison C, Glover D, Gilchrist S, Casey M, Lanza A, Lane R, et al. A program guide for public health: partnering with pharmacists in the prevention and control of chronic diseases. Atlanta, GA: Centers for Disease Control and Prevention, 2012.

Articles – Community Pharmacists

Bunting, Barry A., Benjamin H. Smith, and Susan E. Sutherland. "The Asheville Project: clinical and economic outcomes of a community-based long-term medication therapy management program for hypertension and dyslipidemia." JAPHA-WASHINGTON- 48.1 (2008): 23.

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World Health Organization. Europe: Pharmacy-Based Hypertension Management Model: Protocol and Guidelines. A joint CINDI/EuroPharm Forum project 2005. Vol. 85730. EUR/04/5049481. ISBN WHOLIS.

3. COMMUNITY HEALTH WORKERS (CHWs)

CHWs are frontline public health workers who are trusted members of and/or have an unusually close understanding of the community served. They do not provide clinical care, generally do not hold another professional license, and their expertise is based on shared culture and life experience with people served. Local health jurisdictions can engage CHWs directly or work with clinical systems to facilitate the integration of CHWs in care teams.

A 2013 ruling by the Centers for Medicaid Services (CMS) allows states to provide Medicaid reimbursement for USPSTF- recommended preventive services when "recommended by a physician or other licensed practitioner" and delivered by a broad array of health professionals, including CHWs. Under this ruling, states determine which services will be covered, who will provide them (including any required education, training, experience, credentialing, certification, or registration), and how providers will be reimbursed. Therefore, implementers of CHW interventions should consider these state-specific regulations when making decisions about CHW engagement in their organizations (The Community Guide under "Considerations for Implementation"; CMS Rule DHHS Federal Register July 15, 2013).

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Engage CHWs directly to promote and support management of high blood pressure	Interventions that engage community health workers to focus on cardiovascular disease (CVD) prevention implement one or more of the following models of care: 1. Screening and Health Education. Community health workers screen for high blood pressure, cholesterol, and behavioral risk factors recommended by the United States Preventive Services Task Force (USPSTF); deliver individual or group education on CVD risk factors; provide adherence support for medications; and offer self-management support for health behavior changes, such as increasing physical activity and smoking cessation 2. Outreach, Enrollment, and Information. Community health workers reach out to individuals and families who are eligible for medical services, help them apply for these services, and provide proactive client follow-up and monitoring, such as appointment reminders and home visits.	The Guide to Preventive Community Services: Interventions Engaging CHWs Overview Your Heart, Your Life (CHW manual for people who identify as Hispanics/Latinx) With Every Heartbeat is Life (CHW manual for people who identify as African American) Addressing Chronic Disease through CHWs (CDC, 2011) A Community Health Worker Training Resource for Preventing Heart Disease and Stroke	Health Coach for Hypertension Control (HCHC) Project, Oconee County, SC National Heart, Lung, Blood Institute (NHLBI) Communities in Action NHLBI Hispanic/Latino CHWs: implementation examples Penn Center for Community Health Workers IMPaCT program

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Promote CHW inclusion in clinical systems to support management of high blood pressure	Interventions that engage community health workers to provide 1. Team-Based Care. In a team-based care arrangement, community health workers partner with patients and licensed providers, such as physicians and nurses, to improve coordination of care and support for patients. 2. Patient Navigation. Community health workers help individuals and families navigate complex medical service systems and processes to increase their access to care. 3. Community Organization. Community health workers facilitate self-directed change and community development by serving as liaisons between the community and healthcare systems.	The Guide to Preventive Community Services: Interventions Engaging CHWs Task Force Finding and Rationale Statement Making the Connection: The role of CHWs in health homes (Health Management Association, 2012) Approach for Integrating Community Health Workers on the Care Team	Core Health Program--Spectrum Health, Grand Rapids, MI Kentucky Homeplace, 27 counties in Eastern Kentucky Homeplace Director: Mace Baker, mace.baker@uky.edu Virginia Million Hearts Initiative

Articles – Community Health Workers

Allen CG, Brownstein JN, Satsangi A, Escoffery C. Community Health Workers as Allies in Hypertension Self-Management and Medication Adherence in the United States, 2014. *Prev Chronic Dis.* 2016;13:160236.

Dye CJ, Williams JE, Evatt JH. Improving hypertension self-management with community health coaches. Health promotion practice. 2014:1524839914533797.

Newman PM, Franke MF, Arrieta J, et al. Community health workers improve disease control and medication adherence among patients with diabetes and/or hypertension in Chiapas, Mexico: an observational stepped-wedge study. *BMJ Glob Health*. 2018;3(1):e000566.

Ursua RA, Aguilar DE, Wyatt LC, et al. A community health worker intervention to improve blood pressure among Filipino Americans with hypertension: A randomized controlled trial. *Prev Med Rep*. 2018;11:42-48.

Specific to Washington State: SMBP, Reimbursement of SMBP CPT codes, and use of CHWs: CPT codes 99473 & 99474

WA State Medicare OIC: Office of Insurance Commission: does reimburse for SMBP CPT codes

WA State Medicaid HCA: Health Care Authority: does *not* reimburse for SMBP CPT codes per WA State Medicaid rules

Each clinic/FQHC must verify each health care provider with Medicare via NPI #, P10 #, and clinic Tax Id #

Contact the Provider Contact Center for Medicare at 1-877-908-8431

As long as the health care provider signs the order requesting SMBP for the patient, these CPT codes can be billed by the clinic to CMS; the order can then be delegated to an appropriately trained RN, LPN, MA, CHW or Care Coordinator, etc.

4. COMMUNITY ORGANIZATIONS

The types of evidence-based (or evidence-informed) practices included in this section fall into 2 categories: 1) individual-level programs that are delivered by community organizations, or 2) community-level interventions that are implemented through partnerships between multiple organizations. The table below includes only a small number of such examples; however, there are a number of EBP repositories that local health jurisdictions can use to select interventions that are more suitable for their population, location, and resources. These are referenced below.

Intervention	Description	Implementation guidelines or toolkits	Specific examples
Support evidence-based programs delivered by community organizations	CDSMP plus hypertension module	Implementation manual for CDSMP	Living well with Chronic Conditions in WA Contacts: Todd Dubble dubblgt@dshs.wa.gov Derek Jenkins derek.jenkins@dshs.wa.gov Dawn Shuford-Pavlich dawn.shuford-pavlich@dshs.wa.gov
	Other EBPs that may help control high blood pressure: • National Diabetes Prevention Program • Enhance®Wellness • Enhance®Fitness	National Diabetes Prevention Program Implementation Toolkit Implementation guides and additional information about licensing Enhance®Wellness and Enhance®Fitness are available from Sound Generations Contact: Paige Denison, paiged@soundgenerations.org	YMCA's Diabetes Prevention Program
Implement evidence - based interventions at the entire community level	These interventions target the entire population of a community, and frequently involve a number of community organizations as partners	Websites of these projects include details about implementation and potential materials that can be used in other communities NY Academy of Medicine Compendium of Proven Community-Based Prevention Programs • See specific examples in next column	Bootheel Heart Health Project Brief, Missouri Community-Based Multiple Risk Factor Intervention for Cardiovascular Risk, Baltimore, Maryland Primary Contact: Lisa R. Yanek lryanek@jhmi.edu Heartbeat Limburg, Netherlands Pawtucket Heart Health Study, Rhode Island Stanford Five-City Project, Northern California Franklin Cardiovascular Health Program, Franklin County, Maine Shape Up Somerville, Massachusetts

Articles – Community Organizations

Agarwal G, Angeles R, Pirrie M, et al. Effectiveness of a community paramedic-led health assessment and education initiative in a seniors' residence building: the Community Health Assessment Program through Emergency Medical Services (CHAP-EMS). *BMC Emerg Med*. 2017;17(1):8.

Payán, D. D., Sloane, D. C., Illum, J., Vargas, R. B., Lee, D., Galloway-Gilliam, L., & Lewis, L. B. (2017). Catalyzing Implementation of Evidence-Based Interventions in Safety Net Settings: A Clinical–Community Partnership in South Los Angeles. *Health Promotion Practice*, *18*(4), 586–597.

Schuit AJ, Wendel-Vos GC, Verschuren WM, Ronckers ET, Ament A, Van Assema P, et al. Effect of 5-year community intervention Hartslag Limburg on cardiovascular risk factors. American journal of preventive medicine. 2006;30(3):237-42.

Victor RG, Lynch K, Li N, Blyler C, Muhammad E, Handler J, et al. A cluster-randomized trial of blood- pressure reduction in black barbershops. *N Engl J Med*. 2018;378:1291–301.

Evidence-based intervention repositories

National Cancer Institute's Research-tested Intervention Programs
The Guide to Community Preventive Services, plus real examples of implementation
Promising Practices Database

Additional Resources

CDC Best Practices for Cardiovascular Disease Prevention Programs
The Community Guide: Cardiovascular Disease
Million Hearts

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