



Lifetime of Wellness Provider TOOLKIT

Acknowledgements

This Provider Toolkit was produced by the *Lifetime of Wellness: Communities in Action* program of San Joaquin County Public Health Services. Funded by the Centers for Disease Control and Prevention through the California Department of Public Health, this program is designed to reduce death and disability due to diabetes, heart disease and stroke by addressing the leading risk factors that contribute to these diseases. Specifically, this project includes 15 strategies that:

- Promote health and reinforce healthful behaviors
- Support healthy lifestyles
- Encourage interventions that improve healthcare delivery
- Implement community-clinical linkages.

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We gratefully acknowledge the team from *Intrepid Ascent* whose expertise have made invaluable contributions to this project. Report authors:

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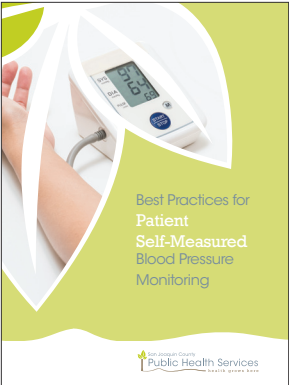
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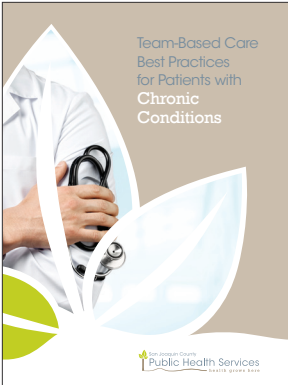
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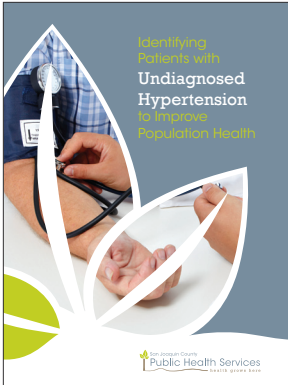
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Best Practices for Patient Self-Measured Blood Pressure Monitoring

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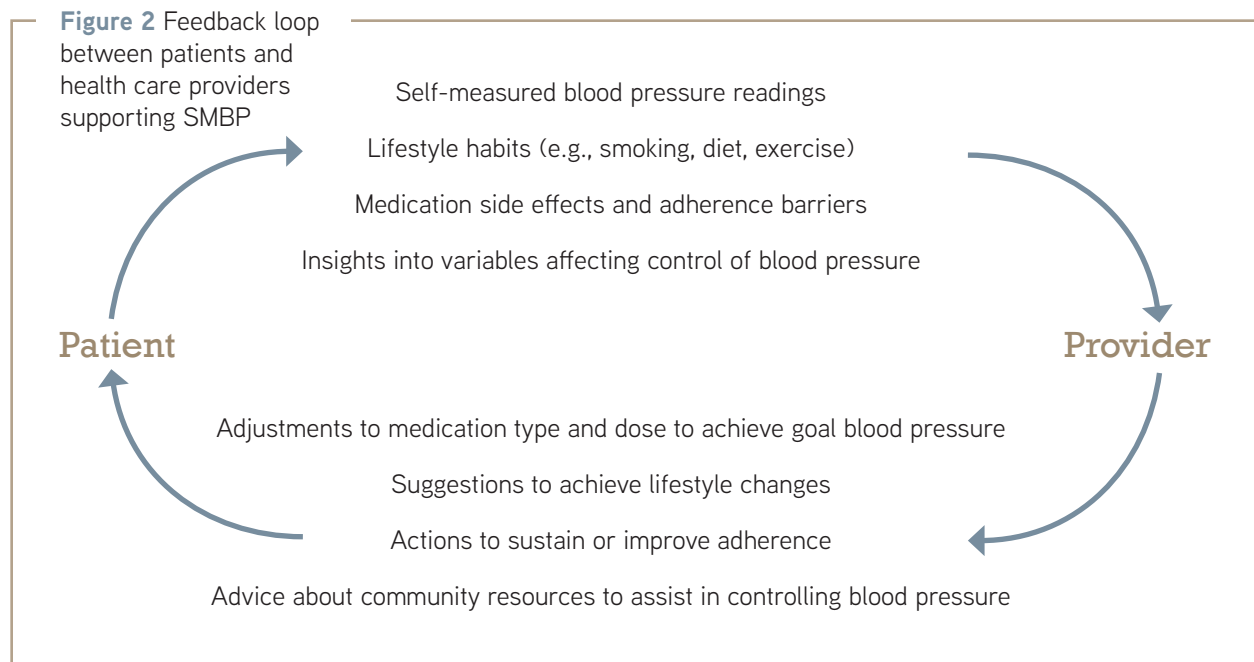
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Self-measured blood pressure monitoring (SMBP) is defined as the regular measurement of blood pressure by the patient outside the clinical setting, either at home or elsewhere. SMBP is being promoted by national health organizations as a key strategy to improve blood pressure control and medication adherence among patients with hypertension (HTN).¹ An Agency for Healthcare Research and Quality (AHRQ) review of the literature shows that SMBP, paired with additional support, is more effective in lowering blood pressure among patients with HTN than usual care. Additional support strategies for SMBP are defined as regular one-on-one counseling, web-based or telephonic support, and educational classes.²

Besides a patient’s home, there are multiple settings where blood pressure can be measured, such as a senior center, pharmacy, church, workplace, or fire station. Although more research is needed to determine the optimal timing and frequency of measurements, experts, including the American Heart Association (AHA), recommend that patients using SMBP take three successive readings (at one-minute intervals) at least twice a day, once in the morning and once in the evening.³

There are three important elements to consider for successful support of SMBP⁴:

- **Delivery of intervention** by trained health care providers (e.g., pharmacists, nurse practitioners, physician assistants, health educators);
- **Regular patient communication** of SMBP readings to providers; and,
- **A patient/provider “feedback loop”** in which provider support and advice are customized based on patients’ reported information (see Figure 2 below).



Source: Million Hearts®

1 https://millionhearts.hhs.gov/Docs/MH_SMBP.pdf

2 http://www.effectivehealthcare.ahrq.gov/ehc/products/193/893/CER45_SMBP_20120131.pdf

3 http://www.heart.org/idc/groups/heart-public/@wcm/@hcm/documents/downloadable/ucm_445846.pdf

4 https://millionhearts.hhs.gov/Docs/MH_SMBP.pdf

The patient/provider “feedback loop” is a critical component to the success of a SMBP program. Patient reported data should be used “during and between patient visits to titrate medication and provide advice on lifestyle modifications if necessary”.⁵ Follow up procedures may need to be adjusted to accommodate between-visit interventions, such as virtual consultations. Timely advice and medication adjustments are the major benefit of the patient/provider “feedback loop” and communication with patients is the main driver of success. As AHRQ found in its review, the best health results are attained when SMBP is paired with ‘additional support’. The three specific areas of additional support strategies (one-on-one counseling, web-based or telephonic support, and patient education) are further discussed below.⁶

1. **One-on-one counseling:** examples include regular telephone calls from nurses to manage blood pressure-lowering medication and in-person counseling sessions with trained community pharmacists.
2. **Web-based or telephonic support:** examples include an interactive computer-based telephone feedback system and secure patient website training plus pharmacist care management delivered through Web communications, both in response to patient-reported blood pressure readings.
3. **Patient Education:** examples include telephone-based education delivered by nurses when patients report poor blood pressure readings, as a means of promoting blood pressure-lowering behavior change by the patient; another may be small-group classes on SMBP technique and lifestyle changes that help lower blood pressure, taught by physician assistants.

The following are suggested steps for clinicians as their organizations implement a comprehensive SMBP program. Additional detail can be found here: [Action Steps for Clinicians \(pdf\)](#)

- Preparing care teams to engage patients in SMBP.
- Selecting and incorporating clinical support systems for SMBP.
- Empowering patients to use SMBP.
- Encouraging coverage for SMBP plus additional clinical support.
- Determining if your EHR vendor supports the incorporation of patient generated results for blood pressure into the clinical record.⁷

⁵ https://www.healthit.gov/sites/default/files/final_smbp_sect_508_tested_no_watermark.pdf

⁶ http://millionhearts.hhs.gov/Docs/MH_SMBP.pdf

⁷ https://www.healthit.gov/sites/default/files/final_smbp_sect_508_tested_no_watermark.pdf

Prepare Care Teams to Support SMBP

- Standardize training
- Understand laws and regulations
- Train relevant members of the care team
- Standardize treatment

Select and Incorporate Clinical Support Systems

- Use an existing model
- Establish feedback loop
- Reach out to partners with health information technology (HIT) expertise

Empower Patients to Use SMBP

- Discuss BP and SMBP
- Choose device
- Check accuracy
- Provide SMBP training
- Provide written guidance
- Choose a BP tracking method
- Subsidize device

Encourage Payer Coverage of SMBP

- Understand health plan reimbursement
- Collaborate with partners
- Understand law and regulations

Source: Million Hearts®

Public health practitioners can play an integral role in garnering support and changing systems to assist in the widespread implementation of SMBP and building support programs around the intervention. Below are several suggested action steps that public health departments may take⁸:

- **Explore the environment** Understand how state and local laws and regulations relating to scope of practice and licensing of telehealth⁹ providers affect payment for SMBP support programs.
- **Work with payers and purchasers** Work with state associations of private insurance, groups of self-insured employers, the state Medicaid office, and the state insurance commissioner to encourage coverage of SMBP and additional support.
- **Work with healthcare providers** Encouraging provider groups to offer “train-the-trainer” opportunities to educate team members on how patients should be taught to self-monitor their blood pressure.

⁸ http://millionhearts.hhs.gov/Docs/MH_SMBP.pdf

⁹ Telehealth (or Telemonitoring) is the use of telecommunications and information technology to provide access to health assessment, diagnosis, intervention, consultation, supervision and information across distance. <https://www.medicaid.gov/medicaid/benefits/telemed/index.html>

- **Help spread the word to the public** encourage health advocacy organizations, community- and faith-based organizations, and patient advocacy groups to share resources to educate the public about the importance of SMBP plus additional support in controlling high blood pressure and to incorporate these messages into broader efforts related to HTN.
- **Monitor and assess progress** evaluate efforts to expand use of SMBP plus additional support.

To maximize the benefits of SMBP patients must also be encouraged to practice self-management of their disease. Influencing a patient's day-to-day decisions about how to respond to new symptoms, what and how much to eat, whether and how to take their medication, or whether to exercise can affect clinical outcomes.¹⁰ Having care team members to assist with goal setting for patients and collaboratively develop written action plans may also be effective at facilitating patient self-management and can lead to improved blood pressure control.¹¹ Finally, directing patients towards community resources that provide exercise classes, nutritional counseling, and smoking cessation guidance can make a big impact on health outcomes.¹²

¹⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3763915/>

¹¹ <http://www.pcori.org/assets/2013/12/PCORI-Hypertension-Workgroup-Topic-Briefs-120413.pdf>

¹² https://www.healthit.gov/sites/default/files/final_smbp_sect_508_tested_no_watermark.pdf



Team-Based Care
Best Practices
for Patients with
**Chronic
Conditions**



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Introduction + Background

Patients with chronic conditions often see multiple providers, have complex treatment plans, and require regular testing to maintain or manage their condition. This creates an environment for potential confusion on behalf of the patient and the possibility of patients slipping through the cracks. The care team model has proven to be successful in treating patients with complex healthcare needs. Moreover, no primary care provider can manage an average panel of patients by him or herself. According to researchers, a typical primary care provider with an average size panel would need more than 18 hours per day to provide preventive and chronic care to their panel of patients. This does not even account for urgent care, which is the most common reason for people to seek medical care.^{1,2}

We are in a perfect storm in primary care, with team-based care being seen as a lifeboat. Current and projected shortages of primary care providers, increasing demand for primary care following the Affordable Care Act, and the increasing burden of care being placed on primary care make it essential to “share the care”³ between primary care providers and extended care team members. Team-based care is defined as the provision of comprehensive health services to individuals, families, and/or their communities. Services are delivered by at least two health professionals who work collaboratively along with patients, family caregivers, and community service providers on shared goals within and across settings to achieve care that is safe, effective, patient-centered, timely, efficient, and equitable.⁴

Team-based care interventions typically include activities to:⁵

- Facilitate communication and coordination of care support among various team members.
- Enhance use of evidence-based guidelines by team members.
- Establish regular, structured follow-up mechanisms to monitor patients’ progress and schedule additional visits as needed.
- Actively engage patients in their own care by providing them with education about medication, adherence support (for medication and other treatments), and tools and resources for self-management (including health behavior change).

There are several documented benefits of team-based care approach:

- Team members interact more closely, which encourages trust and cooperation among them.
- Lower burnout⁶ of provider staff.

1 Yarnall et al. *Am J Public Health* 2003;93:635

2 Ostbye et al. *Annals of Fam Med* 2005;3:209

3 <http://www.jabfm.org/content/25/2/143.full>

4 Naylor MD, Coburn KD, Kurtzman ET, et al. *Team-Based Primary Care for Chronically Ill Adults: State of the Science. Advancing Team-Based Care*. Philadelphia, PA: American Board of Internal Medicine Foundation; 2010

5 <https://www.thecommunityguide.org/sites/default/files/assets/CVD-Team-Based-Care.pdf>

6 Willard-Grace R, Hessler D, Rogers E, Dubé K, Bodenheimer T, Grumbach K. *Team structure and culture are associated with lower burnout in primary care*. *J Am Board Fam Med*. 2014;27(2):229-38

- Each patient benefits from the combined skills of the team, in the needs that might not be recognized in the functional system may be identified in a team environment. Patients are more satisfied.
- Ideally, a team model recognizes and uses the different skill levels of each team member.⁷
- Help organizations pursue the Triple Aim , a framework developed by the Institute of Healthcare Improvement that describes an approach to optimizing health system performance, including, improving patient experience of healthcare (quality and satisfaction), improving the health of populations, and reducing per capita costs. For example, an optimized care team will provide the expertise and resources (tools and time) to jointly plan and customize care and provide support for individuals and families to better manage their own health. By redesigning primary care services and structures to work effectively and efficiently on prevention, health promotion, and chronic disease management, you can improve outcomes and the care experience in a cost-effective way.⁸

Attributes of an Optimized Care Team

In a 2015 study performed by Thomas Bodenheimer, team-based care was observed to understand characteristics of high performing care practices.

Site visits were conducted to 29 high-performing primary-care practices. Observations made in these practices were summarized for common elements exhibited by care teams. A limited literature search was done to review corroborating evidence. Teams observed in the 29 practices were found to exhibit nine elements: a stable team structure, colocation, a culture shift in progress from physician-driven to team-based care, defined roles with training and skill checks to reinforce those roles, standing orders and protocols, defined workflows and workflow mapping, staffing ratios adequate to facilitate new roles, ground rules, and modes of communication, including team meetings, huddles, and minute-to-minute interaction.⁹

- Each organization has to understand the types of services it provides, then decide how the work should be divided among the care team to “supply” those services. This approach begins with understanding the population base and the chronic and acute care needs of the patients.¹⁰ For which patient populations will care teams be deployed?

⁷ *Nursing Malpractice, 2nd edition, By Patricia W. Iyer, Tonia D. Ailken, page 48.*

⁸ http://www.ihl.org/communities/blogs/_layouts/ihl/community/blog/itemview.aspx?list=0f316db6-7f8a-430f-a63a-ed7602d1366a&id=29

⁹ Ghorob A, Bodenheimer T. Ghorob A, Bodenheimer T. *Building teams in primary care: A practical guide. Fam Syst Health.* 2015;33(3):182-92.

¹⁰ http://www.ihl.org/communities/blogs/_layouts/ihl/community/blog/itemview.aspx?list=0f316db6-7f8a-430f-a63a-ed7602d1366a&id=29

- Once the needs of the patient population are captured then a care team may be assembled. Composition of a care team may include: physicians, physician assistants, nurses, dieticians, pharmacists, support staff, patient specialists, social workers, health coaches, community health workers (CHW), and nonclinical staff (peer counselors and receptionists).
- Each care team member should be assigned roles that are appropriate and consistent with the highest level of their expertise and ability.
- Other methods to optimize the care team include using standard protocols, cross-training staff, using huddles to improve communication, and limiting interruptions.

Below is a summary of strategies¹¹ for providing team-based care within your organization:

- a. Approach the development of a team-based care program from every level of the organization:
 - ▶ Engage patients in setting practice-level procedures and policies—this process can help to build a shared understanding of patient-centered team-based care among patients and providers. Among other topics, practices can seek patient input on:
 - How all members of the patient-centered care team should function and communicate to best serve patients’ needs.
 - What patients need and want to know about patient-centered team-based care (and the best ways to share this information).
 - Ideas for maintaining and strengthening patients’ relationships with providers as a practice transitions to team-based care.
 - ▶ Achieve buy-in from leadership. Engaging leadership in developing and reinforcing guiding principles can foster the adoption of the principles throughout the organization.
 - ▶ Use the philosophy to guide decision-making. When making decisions about changes to care design and delivery, practices can assess how well proposed changes align with their philosophy and patient preferences.
- b. Prepare providers to apply the practice’s philosophy of team-based care in clinical encounters.
 - ▶ In addition to an organizational commitment to patient-centeredness, a patient-centered approach to team-based care requires provider team members to regard patients as important partners in care, take steps to foster relationships with patients, commit to seeking out each patient’s needs and preferences, listen to patients’ input, and work closely with patients to ensure that the team is responsive to their expressed needs when delivering care. Viewing patients as partners in decision-making and seeking and responding to patient input can be new to some providers who are accustomed to being solely responsible for determining the best course of action for patients (and some patients may still prefer that type of relationship).
- c. Create the practice-level infrastructure needed to support ongoing learning and improvement of team-based care.

¹¹ <https://pcmh.ahrq.gov/page/creating-patient-centered-team-based-primary-care>

- ▶ Ensure proactive support from leadership.
 - ▶ Define and track measurable and specific goals related to providing team-based care.
 - ▶ Provide access to an Electronic Health Record for all team members for improved integration and information sharing.¹²
- d. Leverage existing resources to assemble high performing teams.
- e. Promote the care team as an identifiable and well-functioning entity to patients.
- ▶ In this model, patients feel known and cared for by the whole team over time. Developing the identity of the provider team, so that the team looks and feels like a coherent entity to patients, is an important stepping stone for building smooth and continuous team relationships with patients.

An Institute of Medicine of the National Academies published discussion paper is an additional resource to guide the optimization of care teams.¹³ The paper features “core principles that embody ‘teamness’”. The authors go on to describe each principle and how each plays out in team environments. The principles are listed below:

- **Shared goals:** The team—including the patient and, where appropriate, family members or other support persons—works to establish shared goals that reflect patient and family priorities, and can be clearly articulated, understood, and supported by all team members.
- **Clear roles:** There are clear expectations for each team member’s functions, responsibilities, and accountabilities, which optimize the team’s efficiency and often make it possible for the team to take advantage of division of labor, thereby accomplishing more than the sum of its parts.
- **Mutual trust:** Team members earn each other’s trust, creating strong norms of reciprocity and greater opportunities for shared achievement.
- **Effective communication:** The team prioritizes and continuously refines its communication skills. It has consistent channels for candid and complete communication, which are accessed and used by all team members across all settings.
- **Measurable processes and outcomes:** The team agrees on and implements reliable and timely feedback on successes and failures in both the functioning of the team and achievement of the team’s goals. These are used to track and improve performance immediately and over time.

¹² <https://www.healthit.gov/providers-professionals/improved-care-coordination>

¹³ <https://www.nationalahec.org/pdfs/vsrt-team-based-care-principles-values.pdf>

A focus on Community Health Workers to support a comprehensive team
Non-clinical team members, such as CHWs, can provide much needed support to provider organizations utilizing a team-based methodology. Non-clinicians can take on expanded roles that include patient engagement and advocacy, health education, and care management. CHWs can play a critical role in providing services to patients between clinical visits such as Flu or healthy eating education and outreach.

A major challenge of this approach is finding a “financing mechanism” to sustain continued support. The following paper outlines strategies for and provides examples of state Medicaid financing of non-clinician services in fee-for-service, managed care, medical home or health home, and accountable care organization (ACO) settings: <http://www.nashp.org/sites/default/files/NOSOLO-new3.pdf>

Further Reading

The following resources are available as evidence of effectiveness and to help primary care practices build high-functioning teams:

Center for Primary Care Excellence, University of California San Francisco
<http://cepc.ucsf.edu>

The MacColl Center for Health Care Innovation <http://improvingprimarycare.org/>

The Cambridge Health Alliance http://www.integration.samhsa.gov/workforce/team-members/Cambridge_Health_Alliance_Team-Based_Care_Toolkit.pdf

AHRQ’s TeamSTEPPS® for Primary Care <http://www.ahrq.gov/professionals/education/curriculum-tools/teamstepps/primarycare/>

The Safety Net Medical Home Initiative <http://www.safetynetmedicalhome.org/change-concepts/continuous-team-based-healing-relationships>

National Academy for State Health Policy, Strategies for Supporting Expanded Roles for Non-Clinicians on Primary <http://www.nashp.org/sites/default/files/NOSOLO-new3.pdf>
Care Teams

Identifying
Patients with
Undiagnosed
Hypertension
to Improve
Population Health



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Introduction + Background

High blood pressure, or hypertension, affects millions of Americans, with many individuals going undiagnosed and untreated. Million Hearts®, a national campaign initiated in 2011 by the U.S. Department of Health and Human Services, to prevent 1 million heart attacks and strokes by 2017, designates undiagnosed hypertensive patients as “hiding in plain sight” (HIPS). Because hypertension rarely has symptoms, it is not often a topic patients discuss with their healthcare providers. Even while following best practices and providing the highest level of care, providers can have patients who are at risk for hypertension or who remain undiagnosed. Uncontrolled hypertension is a leading cause of heart disease and stroke¹, with an estimated 13 million U.S. adults with hypertension, not even aware they have the condition and are not being treated². Many of these patients reportedly have health insurance and see their providers at least twice per year but remain undiagnosed³. Uncontrolled hypertension is also linked to increased risk for kidney and heart failure.

This Guide can be used by healthcare organizations seeking to make improvements associated with undiagnosed hypertension. CDC defines undiagnosed hypertension as any patient with multiple abnormal blood pressure values, e.g. systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg, recorded in the medical record without report of a provider diagnosis code (ICD-9-CM 401-405 or the new ICD-10 code). Specifically, it will aid organizations to:

- Identify eligible patients at the point-of-care
- Identify eligible patients who do not have an upcoming visit, using data from electronic medical records or in-house disease registry
- Implement best practices such as pre-visit huddles and outreach to patients in order to ensure that patients who may have undiagnosed hypertension get diagnosed and receive appropriate, effective and timely care, regardless of whether they have a visit scheduled.
- Engage with patients using evidence-based practices such as health coaching, and emerging practices such as home-based blood pressure monitoring, that empower patients to better manage their disease and improve their health
- With increasing adoption of electronic tools and automated quality reporting, including the use of electronic health records (EHR) and health information exchange (HIE), this guide incorporates best practices that may be used to include reporting of data on undiagnosed patients amongst the reporting capabilities.

Building a Program to Address Undiagnosed Hypertension

In planning a program to improve the health of patients and/or assigned members with undiagnosed hypertension or other diseases including pre-diabetes, there are three major factors, with important questions to be answered during the planning phase. This Guide provides information to help healthcare organizations undertake each of these steps, make key decisions along the way, and build an effective program tailored to the strengths and needs of your organization and community.

¹ Nwankwo T, Yoon SS, Burt V, Gu Q. Hypertension among adults in the US: National Health and Nutrition Examination Survey, 2011-2012[777 KB] NCHS Data Brief, No. 133. Hyattsville, MD: National Center for Health Statistics, Centers for Disease Control and Prevention, US Dept of Health and Human Services, 2013.

² D Mozaffarian et al (2016). Heart Disease and Stroke Statistics — 2016 Update. *Circulation*; 133: e38-e360. doi: 10.1161/CIR.0000000000000350

³ Yoon S, Fryar C, Carroll M. Hypertension Prevalence and Control Among Adults: United States, 2011–2014. NCHS Data Brief, No. 220. Hyattsville, MD: National Center for Health Statistics, Centers for Disease Control and Prevention, US Dept of Health and Human Services, 2015.

1. Patient Population Identification

- a. Who is the target population and what standard automation may be incorporated in the identification of them using existing systems?
 - i. Level of engagement with your health system
 - Active patients? How defined?
 - Inactive patients?
 - Assigned members?
 - ii. Which condition?
 - Undiagnosed hypertension, hypertension or both?
 - iii. Sub-populations by risk/level of engagement? The following are examples and not an exhaustive list:
 - People with diagnosed hypertension who have not had a visit in >1 year?
 - People with diagnosed hypertension with blood pressure readings of ≥ 140 mmHg SBP or ≥ 90 mmHg DSP at two separate medical visits during a defined period of time.
 - People with HbA1c above a certain threshold & have other major risk factors such as obesity, cardiovascular disease, or socio-demographic risk factors that may assist in reducing risk of hypertension if identified, counseled effectively and take accountability to reduce the risk of this disease.
- NOTE: The decision about which population to target can be informed by doing an initial data analysis to determine the size of the potential target population(s). Depending on your health system's capacity to provide relevant services, you could then narrow the target population for the initial program, if necessary.*
- b. Extract data on patients meeting those criteria using EHR, data analytics tools and/or other database(s), providing visibility to data analysts and extended care team personnel.
 - i. What algorithm(s) will you use or adopt?
 - ii. How will this algorithm be converted into a data extraction report (for pulling patient lists) and/or an alert or flag in your EHR (for use at point-of-care)?
 - iii. What is the process for ongoing data extraction and identifying patients pre-visit who meet the criteria?

2. Intervention Design

- a. What are best practices for diagnosing, treating, and partnering with patients to manage hypertension and/or pre-diabetes? E.g.:
 - i. Huddles
 - ii. Panel Management
 - iii. Health Coaching
 - iv. Referral to CDC or other-recognized lifestyle change program
- b. What resources can be deployed in this effort? E.g.:
 - i. Non-physician care team members
 - ii. Training on health coaching, motivational interviewing, etc.
 - iii. Community resources

- c. What can be tried on a small scale (e.g., Plan-Do-Study-Act cycles), tested, and spread only once it shows promise as an effective and feasible intervention?

3. Implement, Track & Report Data on Utilization and Outcomes

- a. How will you spread the interventions/best practices?
- b. What data will you track, and how will you track and report data on effectiveness of the interventions/best practices?

Once the goals and actions associated with the 3 factors have been worked out and established amongst stakeholders throughout the organization, it is time to implement the steps to establishing visibility in to the patient population and commencing staff alignment into collection and use of the data, along with how action will be taken with patients, using the information at hand.

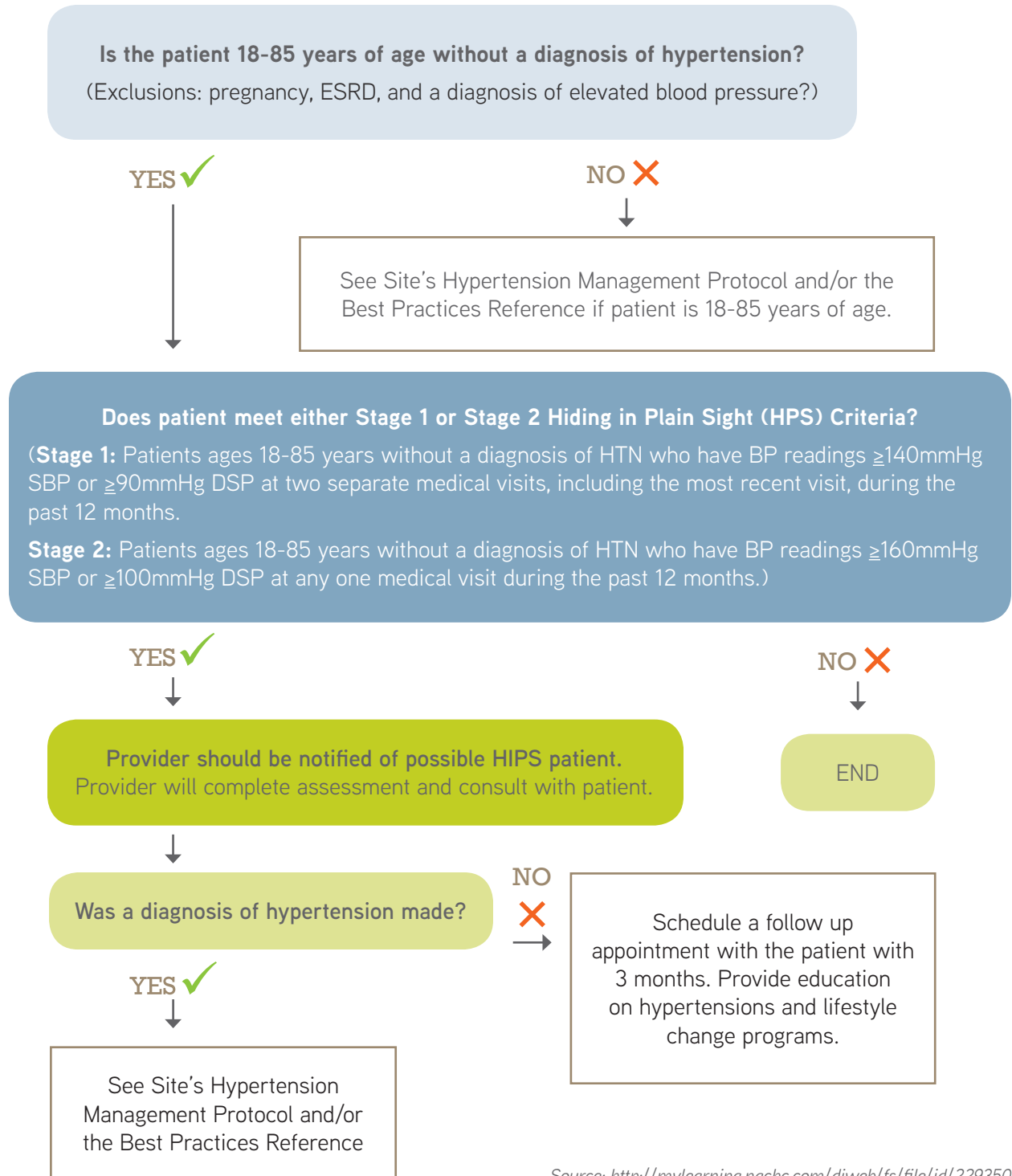
Implementing Steps to Impact the Patient Population

Step 1: Utilize national or provider-specific guidelines to screen individuals at the point-of-care for possible undiagnosed hypertension

The National Association of Community Health Centers and the Million Hearts Initiative have published useful guidelines around identifying potentially hypertensive patients who may be “hiding in plain sight” (HIPS). Using these guidelines, providers and care teams can identify patients who may have undiagnosed hypertension, during a primary care visit. The flow chart below outlines a sample workflow to assist providers in identifying patients for possible undiagnosed hypertension. The entire change package, including further example flowcharts, is available at <http://mylearning.nachc.com/diweb/fs/file/id/229350>. Within the change package found at this website videos, tools, clinical protocols and flow charts for understanding undiagnosed hypertension and identifying and treating individuals “hiding in plain sight”, can be found.

⁴<http://millionhearts.hhs.gov/tools-protocols/hiding-plain-sight/index.html>

Point of Care Possible Hypertension Identification



Once the protocol is mapped out based on review of best practices and feedback from clinicians within the facility, health information technology resources may use this information to then identify critical parameters to be used in the automated identification of patients using reports.

Step 2: Extract data from EHR or disease registry to identify patients who may have undiagnosed hypertension, in order to conduct outreach to bring patients in for visit.

Data extraction can take place using various levels of sophistication based on the capabilities and systems available to the healthcare facility. These often can be tiered into 3 layers:

1. **Disease registries** that offer a linear view into the patients using pre-determined algorithms and/or reported disease information that can be used to track patient progress and management.
2. **Electronic Health Records (EHRs)** that offer reporting similar to registries, with the addition of having further data available associated with patient comorbidities, allowing for more in-depth analysis to be performed in the event the healthcare organization has the technical wherewithal to support the reporting requirements.
3. **Data Analytics and Population Health Management (PHM)** solutions that enhance the reporting capabilities by often offering a combination of on-demand reporting across multiple conditions that in turn can be used to establish care plans with patients. Further automated follow up may be performed where appointments may be required or care team interaction is necessary with the patient. This often requires a level of sophistication that involves data extraction, transformation and loading of the data into the PHM tools.

While there is not one national standard algorithm for extracting lists of patients with undiagnosed hypertension from EHRs and other solutions, there are many healthcare organizations that have developed their own algorithms based on national clinical guidelines for detecting undiagnosed hypertension. The key to a successful initiative is to begin small and scale the program as resources allow. Extracting data from the EHR may result in an overwhelming amount of information, so prioritizing and narrowing the scope of the extraction and/or subsequent outreach effort can help mitigate the impact on the organization. The first and simplest dataset to examine may be patients with a hypertension diagnosis who have not received appropriate treatment. The next stage could be extracting a list of patients who may have undiagnosed hypertension.

The screening criteria used for hiding in plain sight (HIPS)⁵ criteria for screening patients for risk of undiagnosed hypertension are outlined below. The following clinical criteria may help organizations in building an algorithm. To identify individuals with undiagnosed hypertension the HIPS criteria recommend one Stage 2 blood pressure reading OR two Stage 1 blood pressure readings in the past 12 months, with no diagnosis of hypertension documented in the EHR.

- Stage 1 Algorithm: Patients ages 18 to 85 years without a diagnosis of HTN who have BP readings ≥ 140 mmHg SBP or ≥ 90 mmHg DSP at two separate medical visits, including the most recent visit, during the past 12 months.
- Stage 2 Algorithm: Patients ages 18 to 85 years without a diagnosis of HTN who have a BP reading ≥ 160 mmHg SBP or ≥ 100 mmHg DSP at any one medical visit during the past 12 months.

⁵<http://jama.jamanetwork.com/article.aspx?articleid=1935131>

Other notable case studies include:

Case Study 1: North Shore University Health System

North Shore University Health System embedded 5 algorithms into their EHR to identify patients at risk for undiagnosed hypertension:

1. Patients whose 3 most recent encounters yielded a mean SBP ≥ 140 mm Hg or a mean DBP ≥ 90 mm Hg and reading at the most recent encounter was SBP ≥ 140 or DBP ≥ 90 mm Hg
2. Patients whose 3 most recent encounters yielded a mean SBP ≥ 140 mm Hg or a mean DBP ≥ 90 mm Hg and reading at the most recent encounter was NOT SBP ≥ 140 or DBP ≥ 90 mm Hg
4. Patients satisfying algorithm 1 or having a reading at the most recent encounter of SBP ≥ 180 or DBP ≥ 100 mm Hg
3. Patients who had 3 encounters with a SBP ≥ 140 or DBP ≥ 90 mm Hg within 12 months before their most recent encounter
4. Patients satisfying algorithm 4 or having an encounter with a SBP ≥ 180 or a DBP ≥ 100 mm Hg within 12 months before their most recent encounter

North Shore found using all five algorithms above at the same time helped to optimally identify patients with potentially undiagnosed hypertension.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4596255/>

Source: <http://www.nacdd1305.org/docs/1305WebinarHWall.pdf>

Case Study 2: Geisinger Health System

Geisinger Health System analyzed data from adult outpatients with at least 3 encounters. They used four criteria to identify patients:

1. The clinical problem list and/or;
2. ICD-9-CM diagnosis associated with the encounter and/or;
3. Antihypertensive medications prescribed and/or;
4. Two elevated BP values based on JNC-7 criteria (2 systolic measures ≥ 140 or 2 diastolic measures ≥ 90).

Further clinical intervention was considered for patients meeting one or more of the above criteria.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4596255/>

Case Study 3: Palo Alto Medical Foundation

The Palo Alto Medical Foundation examined EHR records for outpatients aged ≥ 18 years. Two criteria were used to identify patients:

1. Two or more abnormal blood pressure (ABP) readings $\geq 140/90$ mmHg and/or;
2. Antihypertensive pharmaceutical treatment

The Foundation's study showed a strong association between an appropriate diagnosis of hypertension and treatment. This finding reinforces the importance of effort to improve hypertension diagnosis.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3600431/>

When using a registry or EHR system to create reports for these algorithms, knowledge of the database structure will be necessary, unless the vendor offers a visual tool that allows for point and click functionality when generating reports. Where multiple systems may be used or more sophistication is required, often the use of Extract, Transform and Load (ETL) process are necessary as a means of creating consistency associated with data coming from a variety of sources. This is common when considering PHM tools.

Step 3: Train providers and other care team members on in-reach – how to identify patients during pre-visit planning, or within a visit, who meet criteria for undiagnosed hypertension.

Steps 1 and 2 provide suggestions and best practices around the types of EHR data and clinical values an organization can use to help flag those patients who may be at risk of undiagnosed hypertension. The objective of Step 3 is to outline practices which should be adopted to promote and enable pre-visit planning (or In-reach).

Pre-Visit Planning and Panel Management (Recall) are two tools that enable organizations to ensure that:

- Patients receive appropriate confirming diagnostic tests;
- Proper diagnoses are entered into medical record accurately;
- Patients engage in developing an updated care plan and/or receive referral to community resources to prevent further exacerbation, and proper management, of chronic diseases.

Pre-Visit Planning offers opportunities to improve patient care and to identify gaps in care for patients with upcoming visits. Common pre-visit planning steps include:

- Gathering the necessary information for upcoming visits
- Planning the current patient visit and preparing for the next
- Pre-populating the next day's visit notes with HIPS risks (e.g., lifestyle risks, elevated blood pressure, etc.)
- Arranging for pre-visit lab testing

The American Medical Association has an interactive tool to assist practices in implementing Pre-Visit

Planning. Visit: <https://www.stepsforward.org/modules/pre-visit-planning>

In Panel Management (also known as 'Recall') patients are systematically identified for gaps in care, preventive services, and/or chronic condition management. Panel Management allows organizations to proactively identify and contact patients who are currently accessing the healthcare system but may be unaware of risk factors or medical conditions. A sample recall flow chart is provided in Appendix A. This approach allows clinical staff to improve care for patients who are not necessarily in the office for a visit.

Step 4: Train Providers And Other Staff To Enter Data Into Ehr To Record Relevant Information Required For Accurate Identification Of Patients With Undiagnosed Hypertension, Including Information On Services Provided Elsewhere (Labs Done Elsewhere, Prior Relevant Surgery, Etc.)

When using automation for reporting, it is important to ensure the integrity and completeness of all data that is required to make the reporting useful. Often, with the use of faxes and paper within clinical practice, not all data may be within the systems in order to report effectively. Organizations must ensure that data associated with paper based laboratory results, manual readings associated with blood pressure and other information makes it to the systems being used to complete the picture of the patient's health.

Within point of care tools, it is possible to make certain fields required, selectable from lists and dropdown values and in many cases codified as a means of offering consistency and ease of input, while reducing manual and free-text entry where numerical values may be required. This process is not fool-proof since EHRs, as one example, offer considerable flexibility as to data input, including free-text note taking and scanning of documentation received by paper. However, with properly designed and effectively conducted training processes, users may be offered the understanding of what are acceptable data elements to use with the system and what processes should be followed to ensure that data elements XYZ are entered into the system, coming from various resources and/or 3rd party tools.

This may require small tests of change that invoke the Plan-Do-Study-Act (PDSA) cycles to determine the best practices for specific clinics and how the team interact not just with one another but with the systems.

In the process of being able to find undiagnosed hypertension this starts with consistently capturing and entering vital signs information, for example blood pressure, and being able to compare it against previous readings to see if a trend is becoming established with the patient. By taking the readings and entering at the start of the visit, the clinician may have time to observe any potential issues with the patient. This allows for further conversation and follow up to occur during the course of the visit, instead of waiting until a later date for a report to highlight a pending problem.

EHRs also have a myriad of clinical decision support tools that offer alerts associated with certain warning signs and conditions. It is recommended that organizations coordinate their quality improvement activities with the IT capabilities to maximize the ability to flag items for clinicians to consider while ensuring that false positive alerts are not a hindrance to workflow.

For example, dashboard views of patient vitals may offer visibility at the point of care into blood pressure reading trends and allow the clinician to ask pertinent lifestyle questions or advise or prescribe medications or possible lifestyle changes that may aid the patient in preventing or reducing the effects of a disease.

Step 5: Outreach/Panel Management/Recall

By using electronic systems to report on patients with various risks of disease or necessitating the management of specific diseases, electronic systems today, offer increasing sophistication as to how patients may communicate with clinicians, helping to close the gap of 'out of sight; out of mind' between patient visits.

Reports generated from electronic systems, offer intervention on behalf of clinicians for low level tasks such as introducing automated phone call reminders to patients with certain risk levels. Patients with more extensive conditions for treatment may then have more hands on attention from the care team on a more frequent basis due to time savings. Using such tools, care teams introduce the ability to reduce overhead associated with administrative tasks and incorporate the ability to manage patients more proactively.

Using the following scenario, we can illustrate how reporting and automation can help with panel management. For example, consider a Type II diabetic patient who showed indication of raised blood pressure during their last visit 6 months ago. This patient also has avoided the recommendation of visiting the practice every 90-days as part of their Type-II diabetes management process. After the 90-day period has past, daily reports may flag that patient as not having completed the visit follow up. At that time, not only will the patient show in reports but systems may also send an automated phone call to the patient asking them to follow up by scheduling an appointment at their earliest convenience. This may have certain parameters embedded in which the patient will receive a call over a period of weeks until an appointment is scheduled. Once scheduled, within 24-72 hours of the appointment, the patient will receive an automated appointment reminder informing them of the scheduled appointment that they can keep, change or cancel. Again automation takes this out of an individual staff members hands, freeing up time for more complex effort associated with patients.

Assuming the patient keeps the appointment, care team collaboration during the pre-visit huddle will allow for flags and alerts from the EHR system to be discussed and any actions to be planned when the patient visit takes place. For example, in this case, the clinical team may have the ability to see that in addition to the Type II diabetes, the patient's last 2 blood pressure readings were increasingly elevated, placing them in the un-diagnosed hypertension category. When performing vitals capture during the visit by mid-level staff, the capture of those vitals may offer further evidence that may substantiate both a specific conversation with the patient and action to be taken by the clinician, in addition to the issues the patient is visiting for that day. Additional functions such as drug interaction and allergy checking when prescribing medications, allows providers to more safely administer medications to be taken by the patient to reduce their risk or existing conditions.

It is also important to point out that after the visit, the use of a patient portal that facilitates the sharing of information associated with the patient vitals and laboratory readings allows for both patient and clinicians to remain informed of status. Furthermore, such tools offer the patient access to ask questions directly with their provider, using secure email messaging. By maintaining this line of communications that historically has not always been available without the use of phone or in person visits, the clinical practice increases the quality of care and patient safety and supports improved patient outcomes.

In addition to increasing patient safety and quality of care, systems may also assist with improvements associated with the following:

Risk Management⁶ by:

- Providing clinical alerts and reminders
- Improving aggregation, analysis and communication of patient information
- Making it easier to consider all aspects of a patient's condition
- Supporting diagnostic and therapeutic decision making
- Gathering all relevant information (lab results, etc.) in one place
- Support for therapeutic decisions
- Enabling evidence-based decisions at point of care
- Preventing adverse events
- Providing built-in safeguards against prescribing treatments that would result in adverse events
- Enhancing research and monitoring for improvements in clinical quality

Certified EHRs May Help Providers Prevent Liability Actions By:

- Demonstrating adherence to the best evidence-based practices
- Producing complete, legible records readily available for the defense (reconstructing what actually happened during the point of care)
- Disclosing evidence that suggests informed consent

From a public health perspective electronic solutions such as EHRs and PHM tools also provide a lens into the entire patient population for that facility, no matter how small or large. This management of populations facilitates views into groups of patients suffering from specific conditions, providing an understanding of which patients are controlling their conditions versus those who require varying levels of intervention, and what patients may be neglecting their interaction with their healthcare provider. In turn this segmentation allows for various levels of interactions to be initiated by the care team, ultimately geared towards more consistent follow up for those who need it, in order to impact their current situation. Socio-economic, age, gender, insurance coverage and ethnicity factors also correlate across many chronic conditions in particular. These groups may then be allocated to care teams and care management. Using protocols established within the facility, these team members will then implement processes that take into account the level of intervention required for the patient group in question, to consistently offer follow up, education and awareness, in addition to further touch points that allow for increasingly proactive care provision that aligns with Patient Centered Medical Home (PCMH) concepts.

⁶<https://www.healthit.gov/providers-professionals/improved-diagnostics-patient-outcomes>

Further Reading

Further reading associated with outreach, management of patients using EHRs, access to patient portal use and conducting patient centered care may be found at:

Topic	URL
EHR Optimization for Million Hearts Blood Pressure Management	https://www.ihs.gov/RPMS/PackageDocs/PXRM/v2.0%20p1004-1005%20EHR%20Million%20Hearts%20guide.pdf
Stakeholder Perspectives on Changes in Hypertension Care Under the Patient-Centered Medical Home	http://www.cdc.gov/pcd/issues/2016/15_0383.htm
Primary Care Innovation Network, Billing, Coding and EHR Documentation for Diabetes and Hypertension	https://pcin.org/resources/diabetes-hypertension-billing-coding-ehr-documentation-nyc-reach/
HRSA Meaningful Use Guide for Safety Net Providers	http://www.hrsa.gov/healthit/meaningfuluse/
Tips on utilization of patient portals	https://healthinsight.org/tools-and-resources/download/96-documentation-alerts-and-ehr/211-removing-six-key-barriers-to-online-portal-use
Use of technology to identify undiagnosed hypertension and integrate them into a quality improvement initiative	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4096473/

Glossary of Terms

Panel management means ensuring that ALL the patients in a provider’s panel get the recommended preventive and chronic care. This can include identifying patients, such as those with undiagnosed hypertension, who do not know they need chronic care.

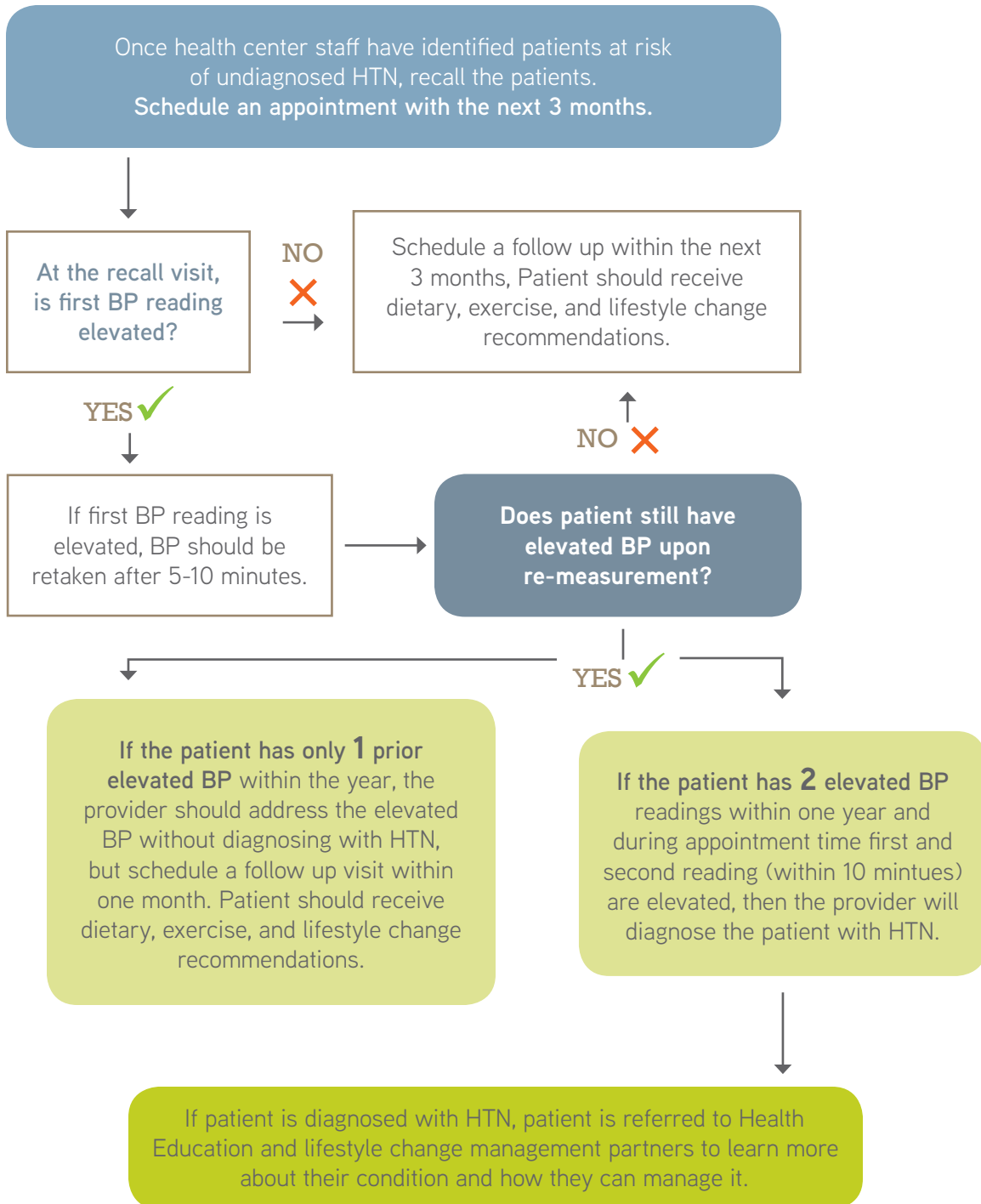
In-reach/scrubbing charts, also referred to as pre-visit planning, is done for active promotion of a service to patients already accessing the healthcare system. It involves reviewing charts before the visit to identify and ensure provision of preventive and chronic care management services needed for each patient. For example, a medical assistant scrubbing the charts of patients coming in the next day can use an algorithm to determine which patients may have undiagnosed hypertension, and create a flag or alert in the EHR for the provider and medical assistant to see during the pre-visit huddle, to ensure they conduct additional diagnostic testing to confirm or rule out hypertension.

Outreach/recall, refers to reaching out to assigned patients who do not have scheduled visits. For example, a data analyst can provide a list to the panel manager of patients assigned to a provider’s panel who have care gaps—i.e., need a preventive screen or are overdue for a chronic care management lab, procedure or visit. Lists of patients who may have undiagnosed hypertension, by provider panel, can be extracted from the EMR using an algorithm.

Patient Registry: A list of patients on a provider’s panel who are due/overdue for needed preventive and chronic care services.

Appendix A

Sample Recall Flowchart Possible Hypertension Recall Workflow



Source: <http://mylearning.nachc.com/diweb/fs/file/id/229350>

Identifying
Patients with
Prediabetes
to Improve
Population
Health



Introduction + Background

Prediabetes is a medical condition defined as blood sugar levels higher than normal but not yet high enough to be classified as type 2 diabetes. According to 2014 Centers for Disease Control and Prevention (CDC) statistics, 86 million Americans, more than 1 out of 3 adults, have prediabetes, yet 9 out of 10 of them do not know they have the condition¹. Without intervention, prediabetes is likely to become type 2 diabetes in 10 years or less. If you have prediabetes, the long-term damage of diabetes — especially to your heart and circulatory system — may already be starting². Fortunately, lifestyle changes and early treatment may return blood glucose levels to the normal range³.

Because prediabetes can often be asymptomatic, patients are usually unaware of the condition and may not discuss it with their healthcare providers. Even while following best practices and providing the highest level of care, providers can have patients who have prediabetes that remains undetected. Therefore, it is critical that healthcare providers proactively identify patients with prediabetes.

This guide can be used by healthcare organizations seeking to make improvements associated with undetected prediabetes. Specifically, it will aid organizations to:

- Identify eligible patients at the point-of-care.
- Identify eligible patients who do not have an upcoming visit, using data from electronic medical records or in-house disease registry.
- Implement best practices such as pre-visit planning and outreach to patients in order to ensure that patients who may have prediabetes are identified and receive appropriate, effective, and timely preventive care, regardless of whether they have a visit scheduled.
- With increasing adoption of electronic tools and automated quality reporting, including the use of electronic health records (EHR) and health information exchange (HIE), this guide incorporates best practices that may be used to include reporting of patients with prediabetes amongst the reporting capabilities, in addition to efforts to engage with patients as it pertains to understanding prediabetes and preventing diabetes.

Building a Program to Address Pre-Diabetes

In planning a program to improve the health of patients and/or assigned members with undetected prediabetes, there are three major steps, with important questions to be answered during the planning phase. This Guide provides information to help healthcare organizations undertake each of these steps, make key decisions along the way, and build an effective program tailored to the strengths and needs of your organization and community.

1. Patient Population Identification

- a. Who is the target population and what standard automation may be incorporated in the identification of them using existing systems?
 - i. Level of engagement with your health system
 - Active patients? How defined?
 - Inactive patients?
 - Assigned members?

¹ <http://www.cdc.gov/diabetes/pubs/statsreport14/diabetes-infographic.pdf>

² <http://www.mayoclinic.org/diseases-conditions/prediabetes/basics/definition/con-20024420>

³ <http://www.diabetes.org/diabetes-basics/diagnosis/?referrer=https://www.google.com/#sthash.gJmD3YsY.dpuf>

- ii. Which condition(s)?
 - Undetected prediabetes, patients with known prediabetes, or both?
- iii. Sub-populations by risk/level of engagement? The following are examples and not an exhaustive list:
 - People with potential prediabetes or diagnosed diabetes who have not had a visit in >1 year.
 - People with potential prediabetes or diagnosed diabetes with uncontrolled blood sugars at two separate medical visits during a defined period of time.
 - People with elevated blood pressure and other major risk factors such as obesity, cardiovascular disease, or socio-demographic risk factors

NOTE: Decisions about target population can be informed by doing an initial data analysis to determine the size of the potential target population(s). Depending on your health system's capacity to provide relevant services, you could then narrow the target population for the initial program, if necessary.

- b. Extract data on patients meeting those criteria using EHR, data analytics tools, and/or other database(s), providing visibility to data analysts and extended care team personnel.
 - i. What algorithm(s) will you use or adopt?
 - ii. How will this algorithm be converted into a data extraction report (for pulling patient lists) and/or an alert or flag in your EHR (for use at point-of-care)?
 - iii. What is the process for ongoing data extraction and identifying patients pre-visit who meet the criteria?

2. Intervention Design

- a. What are best practices for detecting, treating, and partnering with patients to prevent the progression of prediabetes to diabetes? E.g.,:
 - i. Huddles
 - ii. Panel Management
 - iii. Health Coaching
 - iv. Referral to Centers for Disease Control and Prevention (CDC) recognized National Diabetes Prevention Program (NDPP) or other-recognized lifestyle change program
- b. What resources can be deployed in this effort? E.g.,:
 - i. Non-physician care team members
 - ii. Training on health coaching, motivational interviewing, etc.
 - iii. Community resources
- c. What can be tried on a small scale (e.g., Plan-Do-Study-Act cycles), tested, and spread only once it shows promise as an effective and feasible intervention?

3. Implement, Track & Report Data on Utilization and Outcomes

- a. How will you spread the interventions/best practices?
- b. What data will you track, and how will you track and report data on effectiveness of the interventions/best practices?

Implementing Steps to Impact the Patient Population

Step 1: Utilize national or provider-specific guidelines to identify and/or screen individuals for possible prediabetes

Screening patients for potential prediabetes at the point of care is an excellent strategy to uncovering a shadow population at risk of diabetes. The CDC has provided a free screening test⁴ that organizations may adopt as a self-assessment tool for patients. Providers can use this test, or one developed internally, to screen for risk factors that may lead to diabetes. The CDC also provides a flow diagram⁵ outlining the key steps to follow in identifying patients with potential prediabetes. Providing patients with a simple self-assessment document is a valuable tool to assisting providers in determining whether to consult a patient on diabetes risk factors.

According to CDC and American Diabetes Association (ADA) guidelines, patients should be screened for the following criteria:

- Physical inactivity
- First-degree relative with diabetes (sibling or parent)
- High-risk race/ethnicity
- Women who delivered a baby >9 lb or were diagnosed with gestational diabetes mellitus (GDM)
- HDL-C <35 mg/dL ± TG >250 mg/dL
- Hypertension (≥140/90 mm Hg or on therapy)
- A1C ≥5.7%, IGT, or IFG on previous testing
- Conditions associated with insulin resistance: severe obesity, Acanthosis Nigricans, Polycystic Ovarian Syndrome (PCOS)
- History of cardiovascular disease

Screening should be performed on adults of any age who are overweight or obese, and who have one or more of the above diabetes risk factors. If screening test is normal, repeat at least every 3 years. The flow chart below outlines a sample workflow to assist providers in identifying patients for possible prediabetes.

⁴ <http://www.cdc.gov/diabetes/prevention/pdf/prediabetestest.pdf>

⁵ http://www.cdc.gov/diabetes/prevention/pdf/point-of-care-prediabetes-identification-algorithm_tag508.pdf

Point of Care Possible Pre-Diabetes and Diabetes Identification

If patient is age ≥ 18 and does not have a diabetes diagnosis, provide self-screening test.
Does self-screening test reveal ≥ 1 risk?

YES ✓

NO ✗

Repeat screening in 3 years.

Is patients BMI ≥ 24 (≥ 22 if Asian) or does patient have a history of gestational diabetes?

YES ✓

NO ✗

Repeat screening in 3 years.

Was Hemoglobin A1C (HbA1C), Fasting plasma glucose (FPG) and/or Oral glucose tolerance test (OGTT) performed in the past 12 months?

YES ✓

NO ✗

Order appropriate tests.

Diagnostic Test	Normal	Pre-Diabetes	Diabetes
HbA1C (%)	< 5.7	5.7–6.4	≥ 6.5
Fasting plasma glucose (mg/dL)	< 100	100–125	≥ 126
Oral glucose tolerance test (mg/dL)	< 140	140–199	≥ 200

Encourage patient to maintain a healthy lifestyle. Continue with exam/consult. Retest within three years of last negative test.

Refer patient to lifestyle change programs. Retest annually to check for diabetes onset.

Confirm diagnosis; retest if necessary. Counsel patient regarding diagnosis. Initiate therapy.

Once the protocol is mapped out based on review of best practices and feedback from clinicians within the facility, health information technology resources may use this information to then identify critical parameters to be used in the automated identification of patients using reports.

Step 2: Extract data from ehr or disease registry to identify patients who may have prediabetes, in order to conduct outreach to bring patients in for a visit.

Data extraction can take place using various levels of sophistication based on the capabilities and systems available to the healthcare facility. These often can be tiered into 3 layers:

1. **Disease registries** that offer a linear view into the patients using pre-determined algorithms and/or reported disease information that can be used to track patient progress and management.
2. **Electronic Health Records (EHRs)** that offer reporting similar to registries, with the addition of having further data available associated with patient comorbidities, allowing for more in-depth analysis to be performed in the event the healthcare organization has the technical wherewithal to support the reporting requirements.
3. **Data Analytics and Population Health Management (PHM)** solutions that enhance the reporting capabilities by offering a combination of on demand reporting for various conditions and care plan tracking and management. Such tools may also offer automated follow up with patients such as appointment and scheduling reminders. This often requires a level of sophistication that involves data extraction, transformation, and loading of the data into the PHM tools.

While there is not one national standard algorithm for extracting data to identify patients with prediabetes from the EHR, there are several algorithms available as references. The key to a successful initiative is to begin small and scale the program as resources allow. Extracting data from the EHR may result in an overwhelming amount of information, prioritizing, and narrowing the scope of the extraction and/or subsequent outreach effort can help mitigate the impact on the organization. The first and simplest dataset to examine may be patients with prediabetes or a diabetes diagnosis who have not received appropriate treatment or follow up testing.

Many tools and options exist to support extraction of actionable data. Organizations may choose to use pre-programmed population health tools such as i2itracks or the specific population health tool within the EHR. Some organizations have opted to employ a data analyst to conduct Extract, Transform, Load (ETL) programming to extract, cleanse, interpret, and display the data.

Some examples of how organizations are using systems to identify at-risk patients, include the following.

American Diabetes Association

The American Diabetes Association⁶ suggests querying the EMR for the following criteria to identify patients with prediabetes.

Query inclusion criteria:

- Age \geq 18, and
- BMI \geq 25 (BMI \geq 22 for Asian individuals), and
- Any of these test values (test performed within 12 months):
 - HbA1C (5.7–6.4%), and/or
 - Fasting plasma glucose (100–125 mg/dL), and/or
 - Oral glucose tolerance test (140–199 mg/dL)

Query exclusion criteria:

- Insulin use
- Previous diagnosis of diabetes

As an organization's program expands, the EMR query can be broadened to identify patients who meet the first two inclusion criteria but do not have the appropriate diagnostics tests on file.

Diabetes Coalition of California

The Diabetes Coalition of California suggests more granular search criteria:

- BMI \geq 25⁷ kg/m², AND any of the following
- Physical inactivity
- Family history of diabetes in 1st degree relative
- Latino, African American, Native American, Asian, Pacific Islander
- Hypertension (140/90 mmHg or on therapy for hypertension)
- HDL <35 mg/dL and/or Triglyceride >250 mg/dL
- GDM or history of baby > 9lbs
- History of CVD
- Clinical condition associated with insulin resistance (such as Acanthosis Nigricans)
- Polycystic ovary syndrome
- HbA1C > 5.7, IGT, or IFG on previous testing

⁶ <http://www.tnaonline.org/document.doc?id=486>

⁷ The Diabetes Coalition of California notes that at-risk BMI may be lower in some ethnic groups.

When using a registry or EHR system to create reports for these algorithms, knowledge of the database structure will be necessary, unless the vendor offers a visual tool that allows for point and click functionality when generating reports. Where multiple systems may be used or more sophistication is required, often the use of ETL process are necessary as a means of creating consistency associated with data coming from a variety of sources. This is common when considering PHM tools.

Step 3: Train providers and other care team members on in-reach⁸ – how to identify patients during pre-visit planning, or within a visit, who meet criteria for potential prediabetes.

Steps 1 and 2 provide suggestions and best practices around the types of EHR data and clinical values an organization can use to help flag those patients who may be at risk of prediabetes. The objective of Step 3 is to outline practices that can be adopted to promote and enable In-reach.

Pre-Visit Planning and Panel Management (Recall) are two tools that enable organizations to ensure that:

- Patients receive appropriate confirming diagnostic tests;
- Proper diagnoses are entered into medical record accurately;
- Patients engage in developing an updated care plan and/or receive referral to community resources to prevent further exacerbation, and proper management, of chronic diseases.

Pre-Visit Planning offers opportunities to improve patient care and to identify gaps in care for patients with upcoming visits. Common pre-visit planning steps include:

- Gathering the necessary information for upcoming visits;
- Planning the current patient visit and preparing for the next;
- Pre-populating the next day's visit notes with diabetes risks (e.g., abnormal blood sugar, lifestyle risks, high blood pressure, etc.);
- Arranging for pre-visit lab testing.

The American Medical Association has an interactive tool to assist practices in implementing Pre-Visit Planning. For more information, visit: <https://www.stepsforward.org/modules/pre-visit-planning>

In Panel Management (also known as 'Recall') patients are systematically identified for gaps in care, preventive services, and/or chronic condition management. Panel Management allows organizations to proactively identify and contact patients who are currently accessing the healthcare system but may be unaware of risk factors or medical conditions. This approach allows clinical staff to improve care for patients who are not necessarily in the office for a visit.

⁸ See Glossary of Terms

Step 4: Train providers and other staff to enter data into ehr to record relevant information required for accurate identification of patients with potential prediabetes, including information on services provided elsewhere (labs done elsewhere, prior relevant surgery, etc.)

When using automation for reporting, it is important to ensure the integrity and completeness of all data that is required to make the reporting useful. Often, with the use of faxes and paper within clinical practice, not all data may be within the systems in order to report effectively. Organizations must ensure that data associated with paper based laboratory results, manual readings associated with blood pressure, and other information makes it to the systems being used to complete the picture of the patient's health.

Within point of care tools, it is possible to make certain fields required, selectable from lists, and dropdown values and in many cases codified as a means of offering consistency and ease of input, while reducing manual and free-text entry where numerical values may be required. This process is not fool-proof since EHRs, as one example, offer considerable flexibility as to data input, including free-text note taking and scanning of documentation received by paper. However, with properly designed and effectively conducted training processes, users may be offered the understanding of what are acceptable data elements to use with the system and what processes should be followed to ensure that data elements XYZ are entered into the system, coming from various resources, and/or 3rd party tools.

This may require small tests of change that invoke the PDSA cycles to determine the best practices for specific clinics and how the team interact not just with one another but with the systems.

In the process of being able to identify potential prediabetes, this starts with consistently capturing and entering blood sugars, BMI, family history, and lifestyle information and being able to compare relevant data against previous readings to see if a trend is becoming established with the patient. Taking the readings and entering at the start of the visit prior to the clinician conducting the main exam, may be a way to allow time for the clinician to see a potential issue and highlight it during the course of the visit, instead of waiting until a later date for a report to highlight a pending problem.

EHRs also have a myriad of clinical decision support tools that offer alerts associated with certain warning signs and conditions. It is recommended that organizations coordinate their quality improvement activities with the IT capabilities to maximize the ability to flag items for clinicians to consider while ensuring that false positive alerts are not a hindrance to workflow.

For example, dashboard views of patient data may offer visibility at the point of care into blood sugar trends and allow the clinician to ask pertinent lifestyle questions, advise/prescribe medications, or advise possible lifestyle changes that may aid the patient in preventing or reducing the effects of a disease.

Step 5: Outreach/Panel Management/Recall

By using electronic systems to report on patients with various risks of disease or necessitating the management of specific diseases, electronic systems today, offer increasing sophistication as to how patients may communicate with clinicians, helping to close the gap of 'out of sight; out of mind' between patient visits.

Using electronic systems, reports may be generated that can automatically intervene on behalf of clinicians for purposes such as phone call reminders to patients who are flagged as non-compliant. These tools support care teams by helping to reduce overhead associated with administrative tasks and incorporate the ability to manage patients more proactively.

Using the following scenario, we can illustrate how reporting and automation can help with panel management. For example, consider an overweight male aged 40 with one HbA1C reading of 6.1 during the last 12 months who was not caught as potentially have prediabetes prior to a new process and software solution being implemented within the clinic. It is likely that an automated tool that screens patient data for diabetes risk, may identify this individual as a patient who requires an office visit. The office's new process for patient outreach and use of a PHM system now flags that patient and places an automated call requesting the patient to schedule an office visit. For the purpose of this example, the patient makes the appointment and has an HbA1C test repeated prior to showing up, allowing the clinician or care team to observe a still high A1C reading. The patient is diagnosed with prediabetes and given a medication regime and a follow up schedule where they should visit the practice every 90-days until further notice. The patient is also granted access to a data reporting tool and purchases a blood glucose monitor to take daily self-readings and provided guidance to a lifestyle change program such as the CDC's ⁹National Diabetes Prevention Program (NDPP).

Sixty days into the process, a care team member sees that the patient's self-reported readings that are not directly input into the EHR, remain high. At that time a call is placed to the patient and a health coach discusses the status of the patient and advises them to come in within the next 2 weeks. Once the appointment is scheduled, 24-72 hours prior to the appointment, the patient receives an automated appointment reminder informing them of the scheduled appointment that they can keep, change, or cancel. Again automation takes this out of an individual staff members hands, freeing up time for more complex effort associated with patients. Assuming the patient keeps the appointment, prior to the visit during pre-visit planning, using flags and alerts from the EHR system, the clinical team may have the ability to see other characteristics that may require follow up during the visit, such as obesity and a need for nutritional and dietician advice. As we can see, the use of data analytics and automation can impact not only the patient but the efficiency in which the clinical team practices medicine and interacts with each other and with the patient.

It is also important to point out that after the visit, the use of a patient portal that facilitates the sharing of information associated with the patient vitals and laboratory readings allows for both patient and clinicians to remain informed of status. Furthermore, such tools offer the patient access to ask questions directly with their provider, using secure email messaging. By maintaining this line of communication that historically has not always been available without the use of phone or in person visits, the clinical practice increases the quality of care and patient safety, as well as supports improved patient outcomes.

⁹ <http://www.cdc.gov/diabetes/prevention/index.html>

In addition to increasing patient safety and quality of care, systems may also assist with improvements associated with the following:

Risk Management¹⁰ by:

- Providing clinical alerts and reminders
- Improving aggregation, analysis, and communication of patient information
- Making it easier to consider all aspects of a patient's condition
- Supporting diagnostic and therapeutic decision making
- Gathering all relevant information (lab results, etc.) in one place
- Supporting therapeutic decisions
- Enabling evidence-based decisions at point of care
- Preventing adverse events
- Providing built-in safeguards against prescribing treatments that would result in adverse events
- Enhancing research and monitoring for improvements in clinical quality

Certified EHRs May Help Providers Prevent Liability Actions By:

- Demonstrating adherence to the best evidence-based practices
- Producing complete, legible records readily available for the defense (reconstructing what actually happened during the point of care)
- Disclosing evidence that suggests informed consent

From a public health perspective, electronic solutions such as EHRs and PHM tools also provide a lens into the entire patient population for that facility, no matter how small or large. This management of populations facilitates views into groups of patients suffering from specific conditions, which patients are controlling their conditions versus those who require varying levels of intervention, and what patients may be neglecting their interaction with their healthcare provider and require more consistent follow up in order to impact their current situation. Socio-economic, gender, insurance coverage, age groups and ethnicity are all factors that correlate across multiple chronic conditions. By reporting on such attributes and segmenting populations into logical groups, they may then be allocated to care teams and care management. Using policies established within the facility, team members will then intervene with the patient group in question, to consistently offer follow up, education, and awareness.

¹⁰<https://www.healthit.gov/providers-professionals/improved-diagnostics-patient-outcomes>

Additional Reading

Further reading associated with management of patients using EHRs, access to patient portal use, and conducting patient centered care, along with prediabetes and diabetes management, may be found at:

Topic	URL
Impact of Electronic Health Records and Teamwork on Diabetes Care Quality	http://www.ajmc.com/journals/issue/2015/2015-vol21-n12/The-Impact-of-Electronic-Health-Records-and-Teamwork-on-Diabetes-Care-Quality
Pre-Diabetes: Closing the Care Gap; Heather Readhead, M.D., MPH	https://wellness.inhs.org/uploadedFiles/Health_and_Wellness/Resources/Dr.%20Readhead%20presentation.pdf
Measuring the Impact of Patient Portals	http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/PDF%20M/PDF%20MeasuringImpactPatientPortals.pdf
Expansion of Electronic Health Record-Based Screening, Prevention, and Management of Diabetes in New York City	http://www.cdc.gov/pcd/issues/2013/12_0148.htm
Using EHR's to Track Prediabetes Recognition and Treatment	http://www.diabetesincontrol.com/using-ehrs-to-track-prediabetes-recognition-and-treatment/
Registry-based Diabetes Risk Detection Schema for the Systematic Identification of Patients at Risk for Diabetes in West Virginia Primary Care Centers	http://perspectives.ahima.org/registry-based-diabetes-risk-detection-schema-for-the-systematic-identification-of-patients-at-risk-for-diabetes-in-west-virginia-primary-care-centers/
HealthIT.gov – FAQ for EHR (searchable)	http://www.jmir.org/article/viewFile/jmir_v17i2e44/2

Glossary of Terms

Panel management: Means ensuring that ALL the patients in a provider’s panel receive the recommended preventive and chronic care. This can include identifying patients, such as those with prediabetes or unmanaged diabetes, who do not know they need chronic care.

In-reach/scrubbing charts (also referred to as pre-visit planning): Done for active promotion of a service to patients already accessing the healthcare system. It involves reviewing charts before the visit to identify and ensure provision of preventive and chronic care management services needed for each patient. For example, a medical assistant scrubbing the charts of patients coming in the next day can use an algorithm to determine which patients may have risk of diabetes, and create a flag or alert in the EMR for the provider and medical assistant to see during the pre-visit huddle, to ensure they conduct additional diagnostic testing to confirm or rule out diabetes or risk of diabetes.

Outreach/recall: Refers to reaching out to assigned patients who do not have scheduled visits. For example, a data analyst can provide a list to the panel manager of patients assigned to a provider’s panel who have care gaps—i.e., need a preventive screen or are overdue for a chronic care management lab, procedure, or visit. Lists of patients who may have various levels of risk or existing diabetes, by provider panel, can be extracted from the EMR using an algorithm.

Patient Registry: A list of patients on a provider’s panel who are due/overdue for needed preventive and chronic care services.



Join Today!



Right Care Initiative: University of Best Practices



Goal

The California Right Care Initiative's goal is to apply scientific evidence and outcomes improvement strategies to reduce preventable morbidity and mortality among Californians.

The Right Care Initiative has worked since 2007 to improve clinical outcomes by catalyzing uptake of patient-centered, evidence-based best practices among medical groups, clinics, and health plans.

Implementation Actions



ANNUAL
STATEWIDE RIGHT
CARE SUMMIT



CARDIOVASCULAR
DISEASE AND
DIABETES RESEARCH
AT UC BERKELEY



MONTHLY
UNIVERSITY OF BEST
PRACTICES
CONSORTIUM

How to Join:

Meetings occur monthly in Sacramento

To be added to the distribution list, please contact:

Carla (Virdee) Pollock at cvirdee@berkeley.edu

For more information visit:
<https://rightcare.berkeley.edu/ubp/sacramento-ubp>



San Joaquin County Lifetime of Wellness (LOW) Initiative

Measures Crosswalk with Value Based and Mandated Reporting Programs

About Lifetime of Wellness

San Joaquin County Public Health Services has embarked on a Centers for Disease Control and Prevention (CDC) funded initiative, referred to as the “Lifetime of Wellness” (LOW) program. One goal of this program is to work with community partners to support the prevention and management of chronic conditions through the use of technology methods such as electronic health records (EHR) and health information exchange (HIE), particularly through the identification and management of patients with hypertension and pre-diabetes.

Introduction

The purpose of this document is to crosswalk and offer insight into the alignment of standardized clinical quality measures (CQMs) that may impact metrics associated with the LOW initiative. Over the last several years, there has been significant alignment of CQMs across many value-based and other related reporting initiatives, thereby streamlining the data extraction, reporting, and quality improvement activities for clinicians and health systems. This document highlights that alignment for the two LOW measures-- and selected related measures—related to hypertension and diabetes.

LOW requires reporting on two standardized measures related to management of hypertension and diabetes, as highlighted in the crosswalk. However, in addition to improving management of chronic conditions, LOW seeks to promote prevention of chronic conditions, particularly the identification and intervention of undiagnosed hypertension and pre-diabetes, as a means of reducing the overall population with these chronic conditions. Management of such conditions is not enough, as prevention is required to address the overall impact necessary to lower costs and improve overall population health. To date, there are no standardized measures for detection or intervention regarding undiagnosed hypertension and pre-diabetes. However, since this is a focus of LOW, this crosswalk incorporates measures used by large, well-respected healthcare organizations to identify patients with undiagnosed hypertension or pre-diabetes. Through the incorporation of these preventive measures as part of participation in LOW, provider organizations can contribute to identification, tracking, and health improvement across the patient population at greatest risk for chronic illness.

Relevant Value-Based Payment and Other Reporting Initiatives

We identified the following value-based care & reporting programs as relevant initiatives that may be coordinated in tandem with LOW to broaden and enhance the CQM approach:

- **Public Hospital Redesign and Incentives in Medi-Cal (PRIME):** Designed to increase access to coordinated primary care achieved through the prior California Section 1115 Bridge to Reform demonstration, accelerating efforts by participating entities to change care delivery to maximize health care value and strengthen their ability to successfully perform under risk-based alternative payment models (APMs) in the long term, consistent with CMS and Medi-Cal 2020 goals.
- **Uniform Data System (UDS):** An integrated reporting system used by all grantees funded for Federally Qualified Health Centers (FQHC), Migrant and Seasonal Farmworkers, Health Care for the Homeless, and Public Housing Primary Care, under the Health Center grant program administered by the Bureau of Primary Health Care (BPHC), Health Resources and Services Administration (HRSA). The data collected through this report are analyzed to ensure compliance with legislative mandates, report program accomplishments, and justify budget requests to the U.S. Congress.
- **Merit Based Incentive Payment System (MIPS):** A new program that combines parts of the Physician Quality Reporting System (PQRS), the Value Modifier (VM or Value-based Payment Modifier), and the Medicare EHR incentive program into one single program in which Eligible Professionals (EPs) will be measured on, quality, resource use, clinical practice improvement and meaningful use of certified EHR technology.
- **Healthcare Effectiveness Data and Information Set (HEDIS):** A reporting initiative used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service.
- **Physician Quality Reporting System (PQRS):** A quality reporting program that encourages individual EPs and group practices to report information on the quality of care to Medicare. PQRS gives participating EPs and group practices the opportunity to assess the quality of care they provide to their patients, helping to ensure that patients get the right care at the right time
- **Meaningful Use:** Meaningful use is using certified EHR technology to improve quality, safety, efficiency, and reduce health disparities, engage patients and family, improve care coordination, and population and public health, and maintain privacy and security of patient health information. It is hoped that the meaningful use compliance will result in better clinical outcomes, improved population health outcomes, increased transparency and efficiency, empowered individuals, and more robust research data on health systems.

Identifying Patients with Undiagnosed Hypertension

While a standardized national preventive criteria or method for Identification of undiagnosed hypertension has not been established, there are promising practices.

The Hiding in Plain Sight¹ (HIPS) criteria for screening patients for risk of undiagnosed hypertension are outlined below. The following clinical criteria may help organizations in building an algorithm. To identify individuals with undiagnosed hypertension the HIPS criteria recommend one Stage 2 blood pressure reading OR two Stage 1 blood pressure readings in the past 12 months, with no diagnosis of hypertension documented in the EHR.

- **Stage 1 Algorithm:** Patients ages 18 to 85 years without a diagnosis of HTN who have BP readings ≥ 140 mmHg SBP or ≥ 90 mmHg DSP at two separate medical visits, including the most recent visit, during the past 12 months.
- **Stage 2 Algorithm:** Patients ages 18 to 85 years without a diagnosis of HTN who have a BP reading ≥ 160 mmHg SBP or ≥ 100 mmHg DSP at any one medical visit during the past 12 months.

Crosswalk of Standardized Measures to Screen for and Manage Hypertension

Measure Definitions

Hypertension – Good Control: NQF 18; PQRS 236; GPRO HTN-2 - % of patients who had a diagnosis of hypertension and whose blood pressure was adequately controlled ($< 140/90$ mmHg) during the measurement period.

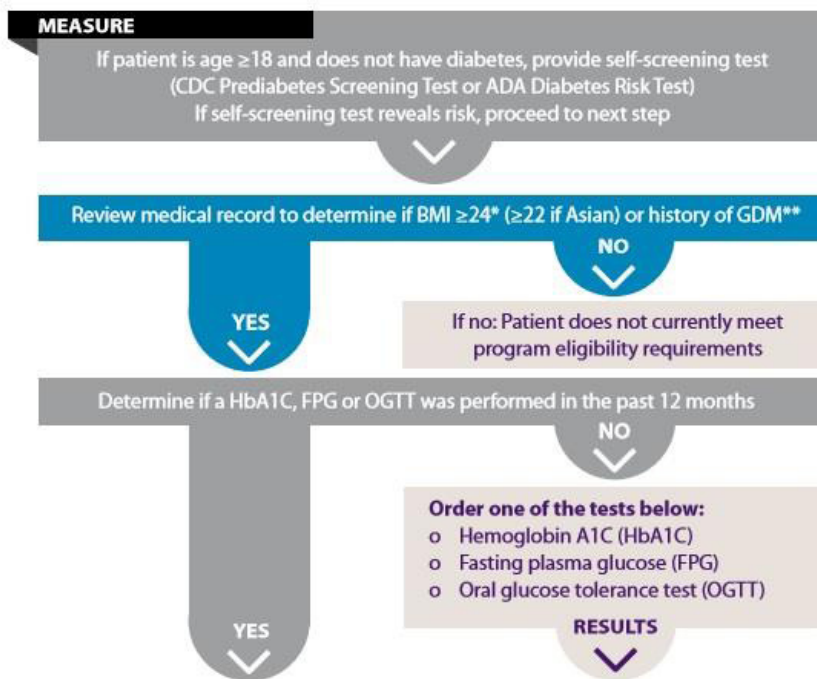
Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented; PQRS 317; GPRO PREV 11 - % of patients aged > 18 years seen during the reporting period who were screened for high blood pressure AND a recommended follow-up plan is documented based on the (BP) reading.

¹ <http://mylearning.nachc.com/diweb/fs/file/id/229350>

Measure	LOW	PRIME	UDS 2016	MIPS	HEDIS	PQRS 2016 - 2017	MU
Hypertension – Good Control		NQF 18 PQRS 236 GPRO HTN-2		NQF 18 PQRS 236	% of members 18–85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled during the measurement year based on the following criteria: <ul style="list-style-type: none"> Members 18–59 years of age whose BP was <140/90mmHg. Members 60–85 years of age with a diagnosis of diabetes whose BP was <140/90mmHg. Members 60–85 years of age without a diagnosis of diabetes whose BP was <150/90mmHg. 	NQF 18 PQRS 236 GPRO HTN-2	
Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented	No other HTN metrics	PQRS 317 GPRO PREV – 11	No other HTN metrics	PQRS 317	N/A	PQRS 317 GPRO PREV – 11	

Identifying Patients with Pre-Diabetes

While a standardized national preventive criteria or method for Identification of pre-diabetes has not been established, there are promising practices. Algorithms for extracting lists of patients from the EHR who may potentially have pre-diabetes can be found online with professional organizations and disease based initiatives, including American Association of Clinical Endocrinologists² and the Diabetes Coalition of California³. Listed below is a recommended workflow for identifying patients at the point of care from the CDC’s Point-of-Care prediabetes identification algorithm⁴



Diagnostic test	Normal	Prediabetes	Diabetes
HbA1C(%)	< 5.7	5.7–6.4	≥ 6.5
Fasting plasma glucose (mg/dL)	< 100	100–125	≥ 126
Oral glucose tolerance test (mg/dL)	<140	140–199	≥ 200

ACT	Normal	Prediabetes	Diabetes
Encourage patient to maintain a healthy lifestyle. Continue with exam/consult. Retest within three years of last negative test.	Refer to diabetes prevention program, provide brochure. Consider retesting annually to check for diabetes onset.	Confirm diagnosis; retest if necessary. Counsel patient re: diagnosis. Initiate therapy.	

² http://diabetescoalitionofcalifornia.org/wp-content/uploads/2013/11/Algorithm_for_Prediabetes_Identification_and_Inter.pdf

³ https://www.aace.com/files/aace_algorithm.pdf

⁴ Source: http://www.cdc.gov/diabetes/prevention/pdf/point-of-care-prediabetes-identification-algorithm_tag508.pdf

Crosswalk of Standardized Measures Diabetes

Definitions for Measures Used for More than One Program

Diabetes – Poor Control: NQF 59; PQRS 01; GPRO DM2 - Percentage of patients 18-75 years of age with diabetes who had hemoglobin A1c > 9.0% during the measurement period.

Diabetes Eye Exam: NQF 0055; PQS 117 GPRO DM-7 - Percentage of patients 18-75 years of age with diabetes who had a retinal or dilated eye exam by an eye care professional during the measurement period or a negative retinal exam (no evidence of retinopathy) in the 12 months prior to the measurement period.

Diabetes Foot Exam: PQRS 163; NQF 0056; GPRO DM-8 - Percentage of patients aged 18-75 years of age with diabetes who had a foot exam during the measurement period.

Measure	LOW	PRIME	UDS 2016	MIPS	HEDIS	PQRS 2016 - 2017	MU
Diabetes – Poor Control		NQF 59 PQRS 01 GPRO DM2			Comprehensive Diabetes Care: The percentage of members 18–75 years of age with diabetes (type 1 and type 2) who had each of the following: <ul style="list-style-type: none"> ▪ HemoglobinA1c (HbA1c) testing. ((NCQA 0034) ▪ HbA1c control (<8.0%) (NCQA 0055) ▪ Eye exam (retinal) performed (NCQA 0057) ▪ Medical attention for nephropathy (NCQA 0062)⁵ 	NQF 59 PQRS 01 GPRO DM2	

⁵See detailed measurement specifications on pp. 119-127 in <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/Downloads/2016-QRS-Measure-Technical-Specifications.pdf>.

Measure	LOW	PRIME	UDS 2016	MIPS	HEDIS	PQRS 2016 - 2017	MU
Diabetes: Eye Exam				No additional DM metrics retinopathy and the presence or absence of macular edema during one or more office visits within 12 months. (NQF 89, PQRS 19)		PQRS 117 GPRO DM-7 NQF 0055 - 1 of 2 measures for Diabetes Composite score (all or nothing, along w/diabetes poor control measure)	PQRS 117 GPRO DM-7 NQF 0055
Diabetes: Foot Exam							PQRS 163 NQF 0056 GPRO DM-8
Diabetes: Urine Protein Screening				No additional DM metrics			CMS134v4 The percentage of patients 18-75 years of age with diabetes who had a nephropathy screening test or evidence of nephropathy during the measurement period.
Diabetes: Low Density Lipoprotein (LDL) Management				No additional DM metrics			CMS163v4 Percentage of patients 18-75 years of age with diabetes whose LDL-C was adequately controlled (<100 mg/dL) during the measurement period.

Conclusion

Incorporation of CQMs that support LOW chronic disease management may be already in place with organizations seeking to participate. In the event such measures are not being reported, participants may be encouraged to align current reporting initiatives with LOW. Preventive measures may not be in place with active reporting conducted on a regular basis. However, by incorporating algorithms such as the example provided for pre-diabetes screening, as illustrated within the EHR or HIE reporting tools, organizations can take action to prevent and reduce the volume of new cases of diabetes and hypertension from occurring while managing existing patients with the diseases.

Lifetime of Wellness Digest

Data Analytics & Population Health Management March 2017

Purpose

This digest offers insights into the use of data analytics and population health management from the perspective of using technology to leverage data and automated communications to enhance the efficiency and effectiveness of care where possible. Also, several examples of programs that use data reporting for the purpose of targeting specific population segments are highlighted, providing samples for organizations to consider when undertaking strategies for care improvement.

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Why Population Health Management and Data Analytics?

Value-based care and quality reporting has increasingly required healthcare organizations and providers to take a different approach to managing patients and viewing data. In order to maximize disease management and create efficiencies and higher quality care, traditional reporting is limited as to the level of value and insight offered from many systems, including Electronic Health Records (EHR). This alignment of value-based care has necessitated the ability to take data that is typically within EHR systems and make it available via different views, in order to analyze and take action in engaging patients using care teams.

Additionally, the Triple Aim¹, a framework developed by the Institute for Healthcare Improvement (IHI) to improve the patient experience of care, the health of populations, and reduce per capita costs of health care, requires a convenient and multi-faceted way to view patient populations in order to meet those goals. This digest offers information associated with why population health management (PHM) is important, what it entails, and how organizations implement processes and systems associated with it. Additionally, examples provide substantiation as to what successes and challenges are encountered in the real world, as means of offering evidence based information that readers may incorporate into specific strategies associated with their local initiatives.

In order to meet these needs in the healthcare environment, today more than ever, data analytics and PHM are increasingly and frequently used terms along with what is called 'big data'. Big data can be defined as a term for data sets that are so large and complex that traditional data processing applications simply do not provide the level of computing power to address the usefulness such data sets can offer. IBM breaks big data into what they call the "Four V's of Big Data"²: Volume, Variety, Veracity, and Velocity, as a means of helping us understand the complexity that comes hand in hand with data analytics. While many healthcare organizations have strategic goals that target quality improvement and healthy populations increasing use of data analytics offers understanding of trends and opportunities for improvement and outcomes that may be made visual and meaningful across the organization. This in turn offers improved context as to what actions may be taken and goal setting when consideration day-to-day operations.

The following example offers a view into sophisticated use of analytics to help impact patient care, using access to medication, treatment, outcomes, and other data components to develop an innovative approach to patient management for hypertension. This this may be an aspirational approach for many healthcare systems but provides an understanding of the power of analytics and reporting.

¹ <http://www.ihl.org/engage/initiatives/TripleAim/Pages/default.aspx>

² http://www.ibmbigdatahub.com/sites/default/files/infographic_file/4-Vs-of-big-data.jpg?cm_mc_uid=03935302768114670901006&cm_mc_sid_50200000=1471646167

Big data gives new insight into blood pressure reduction role of commonly prescribed drug

<https://www.regenstrief.org/news/big-data-gives-new-insight-blood-pressure-reduction-role-com/>

Summary

A new big data study conducted by researchers from the Registries Institute and Indiana University has found that a drug commonly prescribed to conserve potassium in the blood also significantly lowers blood pressure when taken in conjunction with a diuretic frequently prescribed to patients with hypertension. The combination of the two drugs, both available as generics, has been shown to consistently amplify blood pressure reduction in patients with or without the presence of other antihypertensive agents such as ACE inhibitors and calcium channel blockers.

Population Health Management and Data Analytics Solutions

Organizations use tools ranging from basic EHR and/or disease registry reporting to sophisticated data analytics that combine clinical and claims data to help analyze and visualize risk, costs, and areas for clinical quality and patient outcomes improvement. The outcomes of using these tools range in variety from analyzing how to better address the costs of care and targeting of patient cohorts with specific diseases, to using different types of data to address creative ways to improve care. This digest offers insight into initiatives that have used data analytics to address some of the challenges faced by healthcare organizations and their providers.

Meeting the challenges associated with implementing data analytics and PHM projects all start with fundamental steps related to access to data. Based on the sophistication level of the clinic or health system, there are various starting points associated with the technology. They can generally be categorized into three tiers:

1. Clinical Registry Reporting

The Agency for Healthcare Research and Quality (AHRQ) defines a disease/immunization registry as “a tool for tracking the clinical care and outcomes of a defined patient population”.

AHRQ also offers a useful guide for organizations considering registries, named, Registries for Evaluating Patient Outcomes: A User’s Guide. This document provides insight into the planning, registry design, implementation, analysis, interpretation, and quality evaluation of registries used to increase understanding of patient outcomes. The document is available at:

<http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=12>

Registries often will be the typical infrastructure of some PHM solutions, allowing for condition specific and multi-condition reporting that compares practices, clinics, and disease statistics in various manners across the organization.

2. EHR Reporting

An EHR is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports³. Reporting from EHRs as transactional systems can be time consuming and often complex due to variability of use and of data placement throughout the database, where the EHR has been tailored to specific requirements throughout an organization. However, its use is fourfold in that:

- i) The EHR offers a focal point for consistent data input as the organization seeks to optimize its use.
- ii) A standard based and certified EHR offers increasingly good access to data, including codified data and clinical quality measure reporting, built into the system.
- iii) It serves as a clinical decision support tool, which when configured correctly, can address the individual patient considerations in day-to-day clinical operations and point-of-care scenarios. However, a PHM solution may offer broader care management views at the big picture level and high level visibility into what programs may help impact patient care.
- iv) It is also unequivocally the most comprehensive tool available in practice today from which to electronically extract and warehouse data for use in 3rd party solutions, such as the mentioned PHM systems.

EHR use of clinical quality measures and public health reporting under the Meaningful Use program has become increasingly robust under modified Stage 2, with Stage 3 pending for 2018 and beyond. While each EHR vendor can offer direct information as to reporting capabilities, the CMS Meaningful Use program provides regulations for electronic clinical quality reporting. This information can be found at:

- **Stage 3 Meaningful Use Requirements:** <https://www.federalregister.gov/articles/2015/10/16/2015-25595/medicare-and-medicaid-programs-electronic-health-record-incentive-program-stage-3-and-modifications>
- **Electronic Clinical Quality Measures References:** https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms/ecqm_library.html
- **Clinical Quality Measures References:** <https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms/clinicalqualitymeasures.html>
- **Clinical Quality Reporting (HIMSS) References:** <http://www.himss.org/quality-measures-reporting>

³<http://www.himss.org/library/ehr>

3. Population Health Management (PHM) & Data Analytics

PHM can be defined as the aggregation of patient data across multiple health information technology resources, the analysis of that data into a single, actionable patient record, and the actions through which care providers can improve both clinical and financial outcomes. In short, PHM seeks to close gaps in care, prevent diseases, improve care outcomes, and ultimately, reduce costs for providers and in turn patients.

By taking large volumes of data and visualizing trends and gaps, healthcare organizations are increasingly able to convert those observations into action in a relatively rapid and precise manner, especially when grouped with process methodologies that target ongoing quality and performance improvements within the organization. Robust PHM also takes the notion of the patient registry and compounds it, often by incorporating both clinical and financial data to create a more holistic view into how the healthcare system can tackle high ranking care opportunities.

PHM has many definitions but a common definition is that it is the process of establishing patient cohorts based on identified characteristics, creating protocols for each patient group, and treating patients according to their stratification within the greater population. Some consider population health as a visionary statement that seeks to offer improved engagement, education, and co-participation in the management of a patient's health by looking at the bolus of patients with similar issues while managing to the individual level.

Data analytics, while incorporating PHM, also considers a broader view of data analytics which incorporates levels of analytics and varying data components, including financial and claims related data. This is where the term 'big bata' becomes interlaced in the equation since data analysis may be performed at a simple or extremely complex level based on the information used and sought. Based on cross-industry expert input, a framework was established called the Healthcare Analytics Adoption Model⁴ which by design lends itself to the framework of the HIMSS EHR adoption model (EMRAM)⁵, providing stages of analytics capabilities that organizations can aspire to. Further details for each stage may be found at, <https://www.healthcatalyst.com/white-paper/healthcare-analytics-adoption-model/2/>

Creating a strategy and operational approach to data analytics and PHM is a complex process that incorporates the use of data from many different systems. This requires:

- Ability to extract data efficiently and consistently;
- Standard ways to ensure data cleanliness and uniformity;
- Reduction of non-structured data and common use of codified data;
- Warehousing of data for use with systems that can provide ad hoc and ease of access to analytics and population based reporting in order to make end use of reporting simple and action oriented.

⁴ <https://www.healthcatalyst.com/healthcare-analytics-adoption-model/>

⁵ <https://app.himssanalytics.org/emram/emram.aspx>

Establishing Preventive Care Models at Scale

PHM can commence at a basic level and still maintain a high level of value. The following example illustrates less of a sophisticated 'big data' model in favor of how electronic data can be used to take a preventive approach, using data to identify and track a patient population at risk for Type 2 Diabetes.

Independent experts confirm that diabetes prevention model supported by the Affordable Care Act saves money and improves health

<http://www.hhs.gov/about/news/2016/03/23/independent-experts-confirm-diabetes-prevention-model-supported-affordable-care-act-saves-money.html>

Summary

March 2016. First ever preventive service model eligible for expansion under Medicare holds promise for employers, private insurers and patients. Department of Health and Human Services announced a significant step forward in building a healthcare system that works better, spends dollars smarter, and keeps people healthy. In 2011, through funding provided by the Affordable Care Act, CMS awarded the National Council of Young Men's Christian Associations of the United States of America (Y-USA) more than \$11.8 million to enroll eligible Medicare beneficiaries at high risk for diabetes in a program that could decrease their risk for developing serious diabetes-related illnesses. Beneficiaries in the program attended weekly meetings with a lifestyle coach who trained participants in strategies for long-term dietary change, increased physical activity, and behavior changes to control their weight and decrease their risk of type 2 diabetes. The project outcome demonstrated that investment in prevention of chronic conditions saves money and improves quality for patients' health.

While some use the terms data analytics and population health interchangeably, it is important to point out that data analytics will often go beyond the use of clinical information to incorporate financial data such as billing and claims information. Data analytics can present the basis of what areas of focus may be pertinent to the organization, while PHM will entail the use of action oriented reporting, tools and processes that directly impact the care team and patients via direct engagement. In doing so, we may combine various data to establish high and low risk patients across various conditions and co-morbidities and also consider lifestyle and social determinants associated with patients that can then offer providers further ability to educate and raise awareness of post-visit activities that patients should consider. In a recent Health IT Analytics article⁶, five test cases offered a view into the value of PHM and how the use of reporting helped in the aforementioned areas. The ability to use clinical, demographic, and socio-economic data to target interventions with patients is shown.

⁶<http://healthitanalytics.com/news/5-test-cases-to-prove-the-value-of-population-health-management>

In addition to use of mobile technology, EHR data and other determinants, these examples cross over multiple areas including patient engagement and use of multiple data sources to determine target populations.

Improving diabetes prevention with benefit based tailored treatment: risk based reanalysis of Diabetes Prevention Program

<http://www.bmj.com/content/350/bmj.h454>

Summary

This study, completed from patients in the ambulatory care setting, was taken to determine whether some participants in the Diabetes Prevention Program were more or less likely to benefit from metformin or a structured lifestyle modification program. The study concluded that, Patients at high risk of diabetes have substantial variation in their likelihood of receiving benefit from diabetes prevention treatments. Using this knowledge could decrease overtreatment and make prevention of diabetes far more efficient, effective, and patient centered, provided that decision making is based on an accurate risk prediction tool.

Community Vital Signs: Taking the Pulse of the Community While Caring for Patients

<http://www.jabfm.org/content/29/3/419.full>

Summary

In 2014 both the Institute of Medicine and the National Quality Forum recommended the inclusion of social determinants of health data in electronic health records (EHRs). Both entities primarily focus on collecting socioeconomic and health behavior data directly from individual patients. The burden of reliably, accurately, and consistently collecting such information is substantial, and it may take several years before a primary care team has actionable data available in its EHR. A more reliable and less burdensome approach to integrating clinical and social determinant data exists and is technologically feasible.

Engaging Patients

Patient Engagement has become increasingly important due to the dependency on the patient to remain aware and actively managing their health between physician office visits. While PHM solutions will provide ways for patients to be identified and often include the ability to automatically reach out to patients by care team members, further engagement is often necessary. Patients are often taking data capture and tracking into their own hands in various ways using commercially available phone, internet based and wearable tools. Additionally, healthcare organizations are offering access to patient portals and secure email that allow for the potential of 24-7 access to providers when a question or issue arises. One simple step in the continuum of patient engagement is that of providing targeted messaging to patients for whom behavior change is necessary as they manage their condition. The following example provides an understanding of one initiative that took this approach.

The Impact of Automated Brief Messages Promoting Lifestyle Changes Delivered Via Mobile Devices to People with Type 2 Diabetes

<http://www.jmir.org/2016/4/e86/>

Summary

Brief automated messages have the potential to support self-management in people with type 2 diabetes, but their effect compared with usual care is unclear. However, higher rates of success were noticed across lower socio-economic areas and both unidirectional and bidirectional messaging had similar impact.

Patient Generated Health Data

In the value based care world, patient self-management is vital for care providers to maximize their ability to treat their patients effectively. Financial incentives are directly aligned with more engaged patients leading healthier lifestyles, meaning that providers and patient must work together to ensure care improvements, sufficient reimbursement for providers to maintain effective management of their panels, and ultimately improved healthcare for those patients in question.

What are Patient Generated Health Data (PGHD)?

https://www.healthit.gov/sites/default/files/patient_generated_data_factsheet.pdf

Summary

Fact sheet providing information about PGHD and how to consider incorporating it into practice.

Engaging Patients in Managing Chronic Disease: An Analysis of Data from the Connecticut Health Care Survey

<http://www.jopm.org/evidence/research/2016/06/06/engaging-patients-in-managing-chronic-disease-an-analysis-of-data-from-the-connecticut-health-care-survey/>

Summary

Examination of the extent to which patients and providers discuss health goals, patient self-management, and factors associated with increased health risk, particularly among patients with chronic disease, using a large, statewide survey of patients.

The Internet of Things, defined as the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data⁷, has firmly established itself within the healthcare industry. Such tools as connected heart rate monitors, glucometers, fitness trackers, meal and calorie trackers, etc., offer patients the ability to observe and adapt their behavior and how that behavior affects their overall healthcare. With this increasing use of data and self-monitoring by patients comes a wave of data that has and will continue to evolve as to how care team members see and use such data, where it is beneficial to do so. While there is an ongoing debate about how best to integrate patient generated data and how best to use it based on how much is too much and overall value of the data, we do know this trend of sharing and socialization of such data between patients and providers will continue to build. The following document, issued by the Office of the National Coordinator for Health Information Technology, offers some examples of how hypertension and diabetes related data may be used to influence clinical decision making.

National eHealth Collaborative PGHD Final Report

https://www.healthit.gov/sites/default/files/pghitp_finalreport121713.pdf

Summary

The report offers understanding of existing good practices for the use of technology to enhance patients' input into their care, with an emphasis on the relevant Meaningful Use Stage 3 (MU3) recommendations.

Patient Generated Health Data

https://www.healthit.gov/sites/default/files/rti_pghd_whitepaper_april_2012.pdf

Summary

How PGHD is defined, what is the current state of data flow and what are the technical, legal and other issues in using PGHD

In conclusion, there are many aspects across the healthcare continuum in which data analytics and population health modeling may be used. From the betterment of patient care, operational effectiveness and financial performance, organizations are increasingly incorporating sophisticated analytics into the enterprise as a means of establishing models and tracking trends. As seen with the examples provided in this digest, in addition to clinical and financial analytics, patient reported data will progressively become important in the world of value based care where patient engagement and self-management is a critical factor in the cycle of patient care.

⁷Oxford Dictionary

Lifetime of Wellness Digest #2

Quality Improvement & Implementing Evidence-Based Interventions in Management of Diabetes and Hypertension May 2017

Purpose

This digest highlights quality improvement approaches and evidence-based methods of clinical management and care team/system redesign to optimize outcomes for patients with diabetes and/or hypertension.

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		Conclusion	12

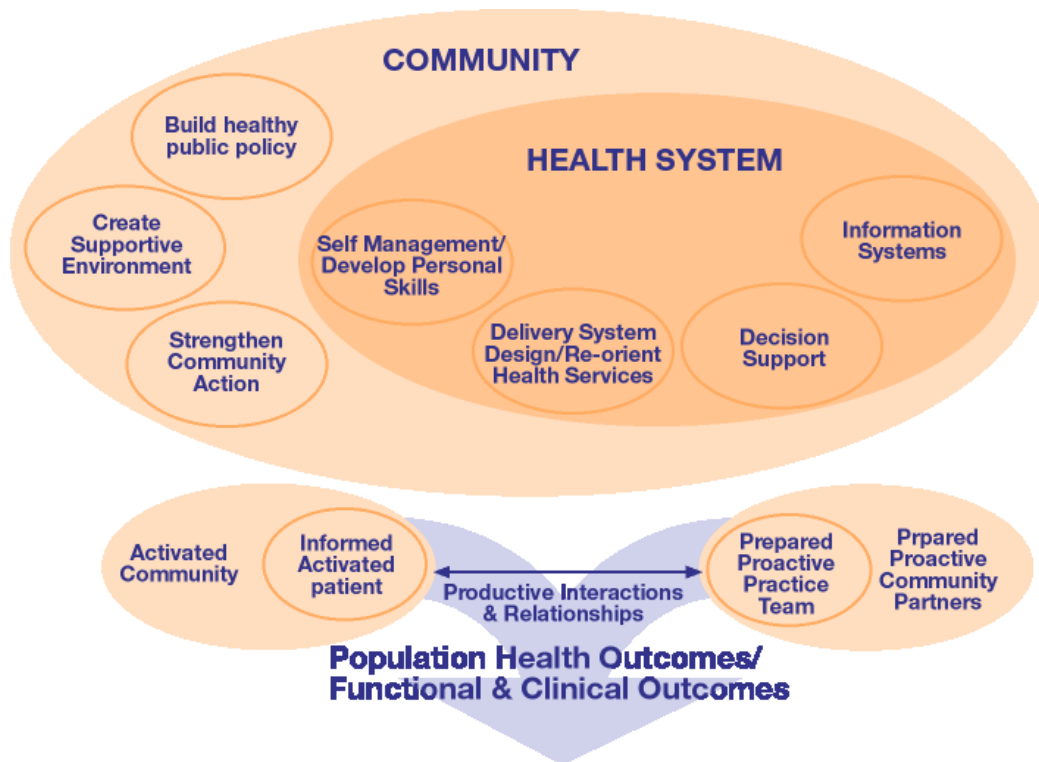
The Role of Quality Improvement in Optimizing Health of Patients with Diabetes and Hypertension

Quality improvement is a science. Per the Institute for Healthcare Improvement, the science of improvement is “...an applied science that emphasizes innovation, rapid-cycle testing in the field, and spread to generate learning about what changes, in which contexts, produce improvements.” Any health care practice or organization should learn the basics of quality improvement before launching any significant effort to improve care and patient health outcomes. The Institute for HealthCare Improvement offers a variety of free and low-cost learning resources and opportunities, particularly focused on the Model for Improvement; however, many health care organizations have adopted Lean Technology as a quality improvement and management system. Both approaches emphasize the importance of health information technology, setting measurable goals, and rapid-cycle testing of change ideas.

Getting Started with Quality Improvement:
<http://www.ihl.org/Topics/ImprovementCapability/Pages/GettingStarted.aspx>.

The Chronic Care Model

Any quality improvement effort to enhance outcomes in diabetes and hypertension care should start with the Chronic Care Model. The Chronic Care Model identifies the essential elements of a health care system that encourage high-quality chronic disease care.



Created by: Victoria Barr, Sylvia Robinson, Brenda Marin-Link, Lisa Underhill, Anita Dotts & Darlene Ravensdale (2002)
 Adapted from Glasgow, R., Orleans, C., Wagner, E., Curry, S., Solberg, L. (2001). Does the Chronic Care Model also serve as a template for improving retention? *The Milbank Quarterly*. 79(4), and World Health Organization, Health and Welfare Canada and Canadian Public Health Association. (1986). Ottawa Charter of Health Promotion.

These elements are the community, the health system, self-management support, delivery system design, decision support, and clinical information systems. Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise. The Model can be applied to a variety of chronic illnesses, health care settings, and target populations. The bottom line is healthier patients, more satisfied providers, and cost savings.

¹Chronic Care Model: http://www.improvingchroniccare.org/index.php?p=Model_Elements&s=18

Health Information Technology Driving Quality Improvement

At the heart of quality improvement is data, which requires health information technology (HIT). The following study highlights an example of how HIT as part of a multicomponent quality improvement initiative can lead to improvements in hypertension care and outcomes.

Technology-driven Intervention Improves Hypertension Outcomes in Community Health Centers

Summary

This study assessed the impact of an electronic medical record (EMR) with clinical Summary: decision support (CDS) and performance feedback on provider adherence to guideline-recommended care and blood pressure (BP) control compared with a standard EMR alone. Open Door Family Medical Centers, a federally qualified health center, implemented a tailored multicomponent CDS system, which included a BP alert, a hypertension (HTN) order set, an HTN template, and clinical reminders. The results showed that patients were 1.5 times more likely to have controlled BP post-intervention than pre-intervention.

There is evidence that the following four features of clinical decision support systems (CDSS), some of which were present in this study, are strongly associated with positive findings: 1) automatic provision of decision support as part of the clinical workflow; 2) provision of recommendations rather than just assessments; 3) provision of decision support at the time and location of decision making; and 4) computer-based decision support.

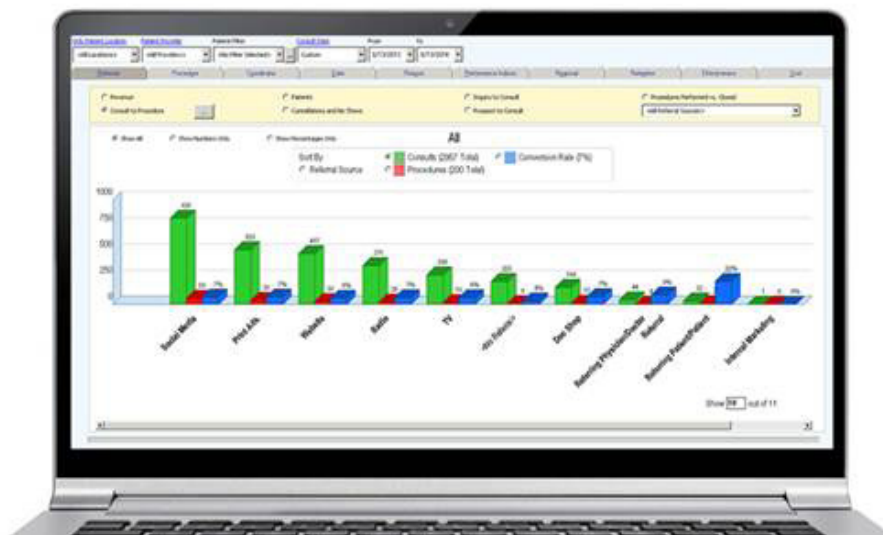
Finally, the CDSS provided opportunities for changes in the clinical team's responsibilities. Open Door's staff was trained to use the new CDSS to screen for adherence to medications, removing this task from the provider and engaging clinical support staff in this dimension of patient care.

<http://www.ncbi.nlm.nih.gov/pubmed/22216768>;

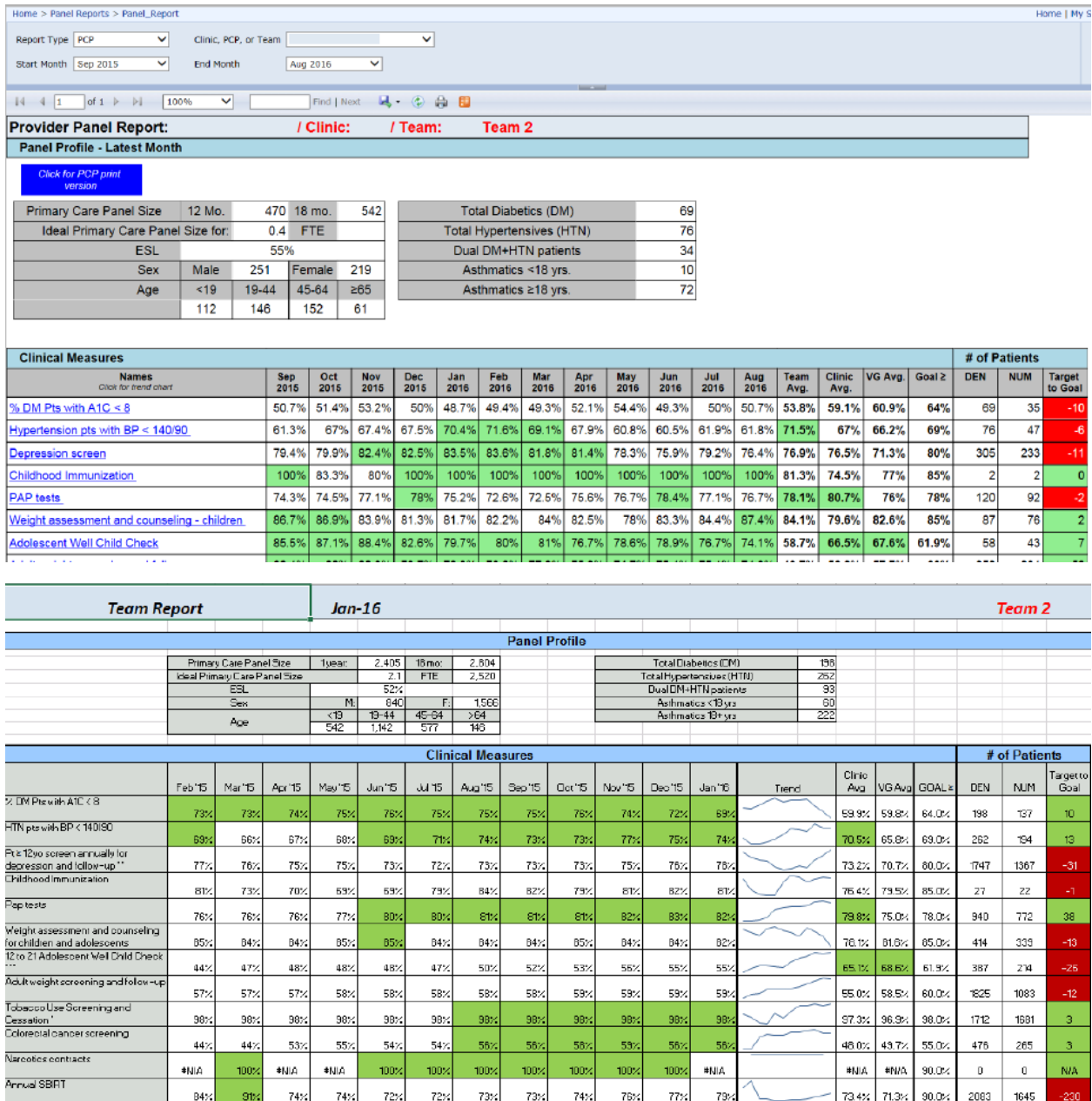
https://healthit.ahrq.gov/sites/default/files/docs/activity/2011_017167_kopal_pdf_3.pdf.

In addition to CDS via the EMR, another effective tool that applies use of data to drive improvement is a performance dashboard. Dashboards display individual provider or care team performance on prioritized clinical improvement metrics—e.g., HbA1c control—for that provider or care team's panel of patients. Dashboards can be effective drivers of improvement if shared frequently with providers and care teams. Providers and care teams tend to improve when they see data reflecting how well they are or are not meeting key quality metrics—especially if those data are shared transparently across the clinic, with patients, and the community.

Dashboards may be provided in various formats and levels of sophistication as noted in the examples below. The first example offers a reasonably sophisticated view into a population health dashboard mock up that provides views for patient compliance within specific conditions, in addition to diabetes and hypertension metrics in a non-graphical manner. This graph can consider one provider or many providers based on the parameters selected for viewing and offers everyone a view into the same data, including roles ranging from executive management to nurse practitioners. This caters to organizations being aligned throughout as to what goals must be achieved, how those goals are being met at any point in time and what the gap is in achieving the goals. In turn this offers the viewers the ability to work as a team to implement changes that may assist in closing gaps.



Below is another example of a simple provider dashboard.



Strategies to make dashboards effective include:

- Establish and communicate clear goals associated with the data shown on the dashboards.
- Provide high visibility by sharing data frequently (monthly or more often) and broadly with all providers/care-team members.

- Can quickly drill down from aggregated views into patient specific references that allow the care- team members to take action. For example, if providers don't know what 36% of their patient panel have uncontrolled blood pressure, the view into the dashboard is meaningless.
- Continue to improve accuracy, and ask providers and care- teams to let data staff know when they find inaccuracies.
- Focus on key performance metrics that matter to the organization and providers.
- Create dashboards that are simple and easy to understand from a quick glance.

The Role of Clinical Guidelines in Spreading High Quality Care

Health care practices and organizations that pursue quality must establish and monitor adherence to evidence-based clinical treatment guidelines. This involves adopting national guidelines such as the JNC-8 for hypertension (see link below), or the diabetes guidelines available from the Guideline Clearinghouse developed by the Agency for Healthcare Research and Quality at <https://www.guideline.gov/search?q=diabetes+clinical+guidelines>. Some practices adapt national guidelines to the unique provider practice style and needs of the patient population.

The following examples of clinical guidelines for managing hypertension include a national clinical guideline, a comprehensive system-wide protocol, a template for provider organizations to use in creating their own clinical guidelines and protocols, and a proven medication algorithm that, when incorporated into a population health management program, has led to a 60% drop in heart attacks and strokes for participating members of Kaiser Permanente.

Summary

Kaiser Permanente's program, Preventing Heart Attacks and Strokes Every Time (PHASE), has led to a 60% reduction in heart attacks and strokes for patients on the three-drug regimen. It is a population-based approach to chronic care management that has proven successful at ensuring effective secondary prevention of coronary events. Developed more than a decade ago by Kaiser Permanente, PHASE uses a three-drug regimen and lifestyle changes to tackle cardiovascular disease (CVD). There is very strong evidence that the three-drug regimen— aspirin, ACE-inhibitors, and statins—substantially reduces CVD events in patients.

JNC-8 hypertension guidelines: <https://www.guideline.gov/search?q=diabetes+care>

New York City Health and Hospitals Hypertension Protocol:
https://millionhearts.hhs.gov/files/NYC_HHC_Hypertension_Protocol.pdf

Million Hearts Template for Hypertension Protocol:
<https://millionhearts.hhs.gov/files/Hypertension-Protocol.pdf>

PHASE Hypertension Medication Algorithm:
https://continuingphase.files.wordpress.com/2015/06/phase_medication_algorithm-2014.pdf

Team-Based Care

One key tenet of the Chronic Care Model is team-based care. Team-based care for managing hypertension is defined as a “health systems-level, organizational intervention that incorporates a multidisciplinary team to improve the quality of hypertension.” Teams comprise the patient, the patient’s primary care practitioner, and other clinicians and care-team staff, such as nurses, pharmacists, social workers, health coaches, and community health workers. Each health team member is tasked with using his or her skills and training to enhance hypertension care by performing activities such as providing information and following up with patients, helping to manage patient medications, and helping patients adhere to their treatment regimen, such as monitoring blood pressure, taking medications, reducing sodium intake, and exercising. Evidence from the review of 80 studies by the Community Services Preventive Task Force shows *that patients who received care from a team of professionals were more likely to have improved blood pressure compared to patients who received care from a single physician.*²

Team-Based Care: Nurses and Pharmacists Effective at Treating Hypertension

Review of Research:

Summary

A 2012 review of research studies on team-based care documents a strong body of evidence that teams are effective in treating hypertension. The review focused specifically on the value of nurses and pharmacists as chronic care-team members. Specifically, the authors propose the following roles:

- A nurse with hypertension expertise to provide education, counsel patients, perform case management, and modify medications and dosages
- A pharmacist to counsel patients about proper medication use, administration, storage, and adverse reactions that might occur, as well as assist with medication management and adjustments in medication for patients not at goal

Few cost-effectiveness analyses have been performed but generally have found favorable costs for team-based care when considering the potential to reduce morbidity and mortality.

https://www.cdc.gov/dhdsp/pubs/docs/science_in_brief_hypertension_team.pdf ;
<http://onlinelibrary.wiley.com/doi/10.1111/j.1751-7176.2011.00542.x/epdf>

²<http://www.pcori.org/assets/2013/12/PCORI-Hypertension-Workgroup-Topic-Briefs-120413.pdf>

Implementing Best Practices in Chronic Care Management: Health Care System Redesign

Among the evidence-based practices that provider practices and health care organizations can implement to improve outcomes for patients with diabetes or hypertension are the following:

1. Health Coaching:

Health coaching is a patient-centered approach to delivering care. Research has shown that half of patients leave medical visits without understanding the clinicians' advice. In only 10% of visits are the patients involved in making the decisions, and patients who are not involved in decision-making traditionally do not follow the clinician's advice. This can lead to poor health outcomes for the patient and frustration for the clinician. Health coaching helps patients build the knowledge, skills, and confidence required to manage their chronic conditions and improve their health. Health coaches empower patients to play a central role in clinical encounters and to engage in self-management activities at home, work, and schools, where they spend most of their lives. Anyone on the care-team can conduct health coaching.

A recent review of the literature found that health coaching for those with diabetes is an effective intervention for improving glycemic control, which may be of greater benefit when offered in addition to existing diabetes care.³ Health coaching has been shown to be more effective at promoting positive healthy lifestyle outcomes, such as smoking cessation or obesity and diabetes management, than traditional health education.⁴ As opposed to health education, which is more of a one-way vehicle to deliver information to patients, health coaching involves an interactive dialogue that provides information AND engages and empowers patients to manage their own health.

Health coaching applies key skills to engage and empower patients to manage their own health, such as Ask-Tell-Ask (also known as Teach-Back), Action Planning (also known as collaborative goal-setting), and Motivational Interviewing. Several research studies provide evidence that these techniques are effective in improving outcomes for people with hypertension and diabetes.⁵

The Center for Excellence in Primary Care at the University of California, San Francisco, provides resources and training on health coaching.⁶

- a. **Panel Management:** Panel management is a proactive way to ensure that patients get all of their preventive care, and those with chronic diseases like hypertension and diabetes receive extra help. For example, panel management identifies patients with diabetes who are due for their regular 3-6-month chronic care visit, an eye exam, or who have lab numbers that are high—and ensures they receive that needed care. Medical assistants, health workers, and nurses play a critical role in providing panel management. Recent studies demonstrate the power of panel management in reducing blood pressure and ensuring that elderly patients get needed care.^{7 8}

³[http://www.canadianjournalofdiabetes.com/article/S1499-2671\(15\)00847-3/pdf](http://www.canadianjournalofdiabetes.com/article/S1499-2671(15)00847-3/pdf)

⁴Cinar AB, Schou L., *Health promotion for patients with diabetes: Health coaching or formal health education?* *Int Dent J* 2014;64:20–6

⁵Schillinger et al, *Arch Intern Med* 2003;163:83-90; Naik et al, *Arch Intern Med*. 2011;171:453-439; Two Feathers et al, *Am J Public Health* 2005;95:1552-1560; Greenfield et al, *J Gen Intern Med*. 1988;3:448–457

⁶<http://cepc.ucsf.edu/health-coaching>

⁷Chuang, Elizabeth, et al. "Implementing panel management for hypertension in a low-income, urban, primary care setting." *Journal of primary care & community health* (2013): 2150131913516497

⁸Loo, Timothy S., et al. "Electronic medical record reminders and panel management to improve primary care of elderly patients." *Archives of internal medicine* 171.17 (2011): 1552-1558.

Panel management is proactive because clinic staff identifies and contact patients about care that they may not know that they need. When staff call, or send letters to patients who do not have an upcoming appointment or have not been seen at the clinic recently, this is called **outreach panel management**. Clinical staff can also alert patients about care gaps when they are in the clinic receiving care for an issue not related to the care gap in a process known as **inreach panel management**.

The Center for Excellence in Primary Care at University of California, San Francisco, provides resources and training on panel management.⁹

2. Group Visits:

The group medical care model (or group visit) is an important inter-disciplinary care delivery innovation to complement the individual medical visit that has become increasingly popular. A group visit brings together a group of patients with similar medical needs or conditions for medical care in an extended appointment with a health care provider. Groups have been used for patients with a range of medical conditions such as diabetes.

Putting Group Visits into Practice

Summary

Patients with diabetes seen in group visits have shown improved adherence to standards of care, higher trust in their providers, significant improvements on clinical measures such as lowered glycosylated hemoglobin (HbA1c) levels, increased self-efficacy, increased satisfaction with care, and lower hospitalization rates. Medical group visits have also been linked to increased quality of life, increased diabetes knowledge, and decreased use of hypoglycemic agents.

To develop successful group visits, each practice must balance the needs of their target patient population with the resources, strengths, and staff available at each practice. While there are generalizable best practices, there is no magic formula for how best to deliver group visits in all cases. This report reviews the current state of group visits and provides a summary of experiences from those who have experimented with group visits in a variety of Mass General- affiliated practices. Overall, group visits can be useful for any practice group, regardless of medical or surgical specialty, and is especially robust in the primary care setting.

Group Visit Implementation Guide:

http://www.massgeneral.org/stoecklecenter/assets/pdf/group_visit_guide.pdf

⁹<http://cepc.ucsf.edu/panel-management>

Financial Impact of Diabetes Prevention Programs

According to the American Diabetes Association the total estimated cost of diagnosed diabetes in 2012 was \$245 billion, including \$176 billion in direct medical costs and \$69 billion in reduced productivity.¹⁰ It is estimated that people with diabetes incur over 20% of U.S. healthcare costs.¹¹ The high cost of treating diabetes is driven in-part by inpatient care, medications, and office visits. Diabetes prevention programs are a tool being utilized and promoted across the country to reduce the incidence of diabetes and educate patients with significant risk factors. But what are the cost benefits and budgetary impacts of such programs?

To help address this question, the California Technology Assessment Forum (an Institute for Clinical and Economic Review (ICER) program) conducted a comparative review of published literature that has examined the economic value of diabetes prevention programs in the U.S. with full or pending recognition from the CDC Diabetes Prevention Recognition Program.¹²

A key finding of the Forum's review is that (in general) group based diabetes prevention programs result in the greatest cost savings. The literature shows programs provided in a group setting have "little or no apparent loss in effectiveness relative to individual coaching". Cost savings were quantified 'in cost per quality-adjusted life-year (QALY) gained' and compared across studies. One study reviewed estimated individual lifestyle intervention (using individual coaching) to cost \$32,000 per QALY gained. Whereas group based intervention is estimated to cost \$9,000 per QALY gained. Another study estimated that the group based "program would be cost-saving over a lifetime, even if effectiveness were reduced by 50%, as downstream savings from reduced diabetes incidence would still be greater than the cost of the group intervention".

It may be inferred from the Forum's report that both individual and group based lifestyle interventions are effective means to improve patient outcomes and reduce risk for progression to diabetes. From a cost perspective group based programs are less expensive to administer and therefore are observed to generate cost savings.

Cost Savings of Population Health and Disease Management

As clinical guidelines and quality improvement efforts are considered by your organization, the cost of care and savings generated from disease management is an important topic to keep in mind. Disease management is defined as a set of activities aimed at improving the health and clinical outcomes of a population of patients, defined by a chronic medical illness.¹³ Depending upon the effectiveness of the program, savings may be realized by reducing utilization of healthcare resources because of better disease management¹⁴. In other instances, a good disease management program may help to bend the cost curve of treating a disease by mitigating upward cost trends¹⁵.

¹⁰<http://www.diabetes.org/advocacy/news-events/cost-of-diabetes.html?referrer=https://www.google.com/>

¹¹http://care.diabetesjournals.org/content/36/4/1033?ijkey=bf8152b1e3dc05e5e7b5bed79d9fc4322cdd0976&keytype2=tf_ipsecsha

¹²https://icer-review.org/wp-content/uploads/2016/05/CTAF_DPP_Draft_Evidence_Report_050916-1.pdf

¹³<http://www.aafp.org/about/policies/all/disease-management.html>

¹⁴<https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/HealthCareFinancingReview/downloads/05summerpg1.pdf>

¹⁵<http://content.healthaffairs.org/content/23/6/63.full>

Return on Investment in Disease Management: A Review

Summary

The results of 44 studies investigating financial impact and return on investment (ROI) from disease management (DM) programs for asthma, congestive heart failure (CHF), diabetes, depression, and multiple illnesses were examined. A positive ROI was found for programs directed at CHF and multiple disease conditions. Some evidence suggests that diabetes programs may save more than they cost, but additional studies are needed. For more information on this study, visit the following link:

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/HealthCareFinancingReview/downloads/05summerpg1.pdf>

Can Disease Management Reduce Health Care Costs by Improving Quality?

Summary

This study illustrates the potential for disease management as one of multiple factors that may reduce the costs of care. Kaiser Permanente Medical Group in Northern California has implemented extensive disease management programs and while the predicted reduction in real costs did not occur, the study concluded that the rationale for disease management programs should rest on their value and effectiveness. By this assumption, we could conclude that without disease management, costs for the Coronary Artery Disease (CAD) population would have increased 28 percent rather than 19 percent from 1996 to 2002. Disease management arguably saved \$77 million for this condition in 2002 alone (\$1,100 per patient × 69,615 patients). Using this method for all four conditions, we can conclude that disease management saved more than \$200 million in 2002. For more information on this study, visit the following link:

<http://content.healthaffairs.org/content/23/6/63.full>

The literature agrees that additional studies are needed to define DM Return on Investment (ROI) and to better describe cost savings and/or cost avoidance. A 2011 study by The Cameron Institute suggests that cost savings may be realized to the greatest extent in populations with significant co-morbidities and advanced illness¹⁶. In another study, of PepsiCo's workplace Healthy Living Program, reductions in healthcare costs were realized resulting from fewer hospitalizations.¹⁷ PepsiCo estimated a \$3.78 savings for every dollar invested into the program.

Multiple resources exist to assist organizations in building robust DM programs. Programs in the studies above include the following: physician-driven, employer-driven, lifestyle change programs, and patient self-management. The commonality across the studies above suggests that effective DM improves outcomes and may in turn lead to cost reductions in the long-term.

¹⁶<http://www.fightchronicdisease.org/sites/default/files/docs/Main%20Report%20-%20The%20effectiveness%20of%20DMPs%20in%20the%20Medicaid%20Pop%202011.pdf>

¹⁷<http://content.healthaffairs.org/content/33/1/124.full>

Conclusion

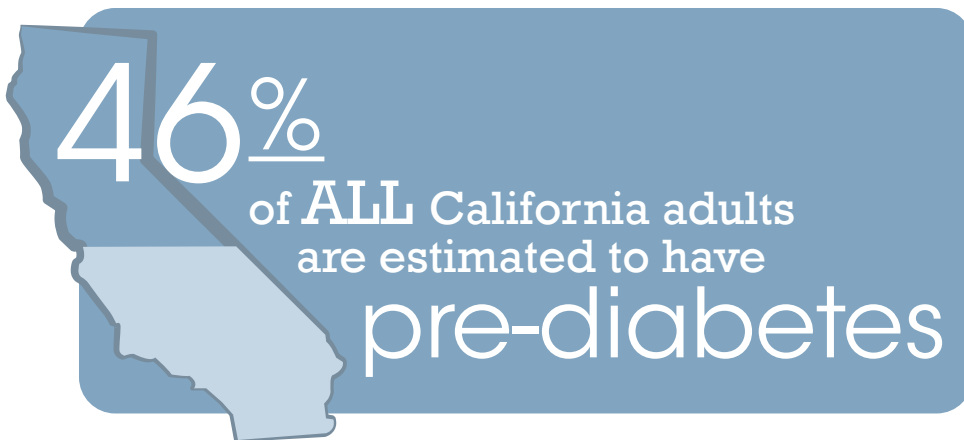
In conclusion, provider practices and health care organizations are under increasing pressure to demonstrate high quality care, as evidenced by improved outcomes for patients with diabetes and hypertension. Doing so requires a dedication to adopting the foundational elements of quality improvement such as health information technology, setting measurable goals and rapid-cycle testing of change ideas.

Once a provider practice or health care organization adopts a quality improvement approach, there is no shortage of proven interventions to improve outcomes for patients with hypertension or diabetes that can be adapted to local circumstances, including: clinical guidelines, electronic medical records and clinical decision support, team-based care, health coaching, panel management, and group visits.

The benefits of delivering high quality care go beyond patient outcomes. Cost savings and cost avoidance captured by programs such as group based diabetes prevention and robust disease management are measurable and proven. Although seemingly daunting, implementing such programs with an incremental approach can help organizations realize the many benefits of quality improvement.

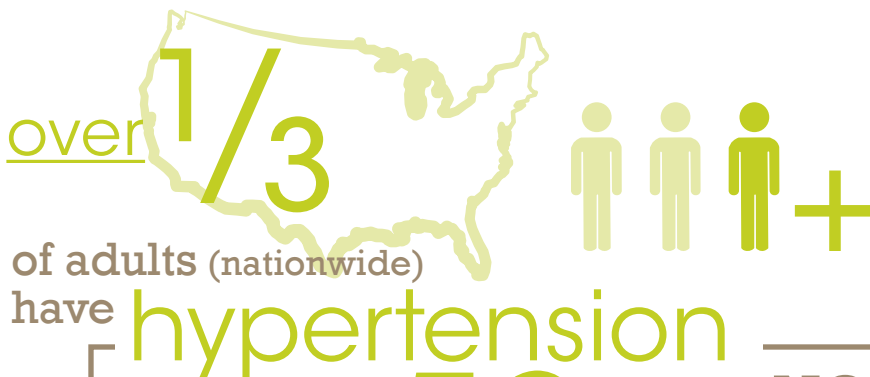
Lifetime of Wellness

The Lifetime of Wellness program is part of a national initiative, funded by the Centers for Disease Control and Prevention through California Department of Public Health, designed to support comprehensive approaches to preventing chronic disease, specifically focusing on diabetes prevention and hypertension. This initiative includes 15 distinct evidence-based strategies.



over 1/2

of the adult population
has either pre-diabetes
or diabetes.



over one-third of
adults with hypertension
DO NOT KNOW
they have it

yet MORE
than **50%** are **NOT** being
treated

While each of these chronic conditions appear different, the factors contributing to them and strategies to prevent them are very similar.

The **1st** group of strategies are focused on changing the community environment to support healthier lifestyles and behaviors.

1. **Supporting healthier food policies** in places that distribute foods such as the Emergency Food Bank, and congregate meal sites like Catholic Charities and the Human Services Agency.
2. **Employee wellness programs** that promote exercise, healthy diet, and general wellness in the workplace.
3. **Refresh San Joaquin** is a collaborative program geared to make healthier options available at corner markets in communities that do not have other healthy and affordable options.
4. **Promoting walkable communities** by working with city officials and other interested organizations/ groups to create communities that promote walking and other means of active transportation for people of all ages and abilities. Last year we hosted Making Safe Strides: Walking for Older Adults Symposium 2016 that has generated interest in several cities to improve their walkability, thus promoting more physical activity among older adults.
5. **Launching the National Diabetes Prevention Program (DPP)** – a CDC-recognized lifestyle change program that enables at-risk participants to adopt healthier behaviors that can lead to the prevention of Type 2 Diabetes.

The **2nd** set of strategies are focused on improving medical care practices and strengthening community-clinical linkages to prevent high risk adults from getting diabetes, and to identify and treat undiagnosed hypertension clients.

1. **Increase provider use** of health information technology to support early detection and referral of pre-diabetic patients into lifestyle change programs, and to identify patients with undiagnosed hypertension. We have developed protocols, clinic guidelines and offer technical support to SJGH and CMC, and other providers who are interested.
2. **Support self-monitoring** of blood pressure among adults by training and equipping staff at community-based organizations and churches to show clients how to take their own blood pressure.
3. **Train pharmacists** to improve medication adherence with software that generates user-friendly, low literacy patient information sheets in 22 different languages.
4. **Training community health workers** to reach out to communities to provide valuable education, linkages, and connections with health care services. Through the Community Health Connector/ Community Health Worker Network meetings, Public Health Services in collaboration with other organizations will support efforts that promote the use of and professional development of community health workers throughout San Joaquin County.
5. **Improve tracking and referral** of pre-diabetic and hypertensive adults into appropriate services. We will generate reports to track the prevalence of pre-diabetes and hypertension through the San Joaquin Community Health Information Exchange.