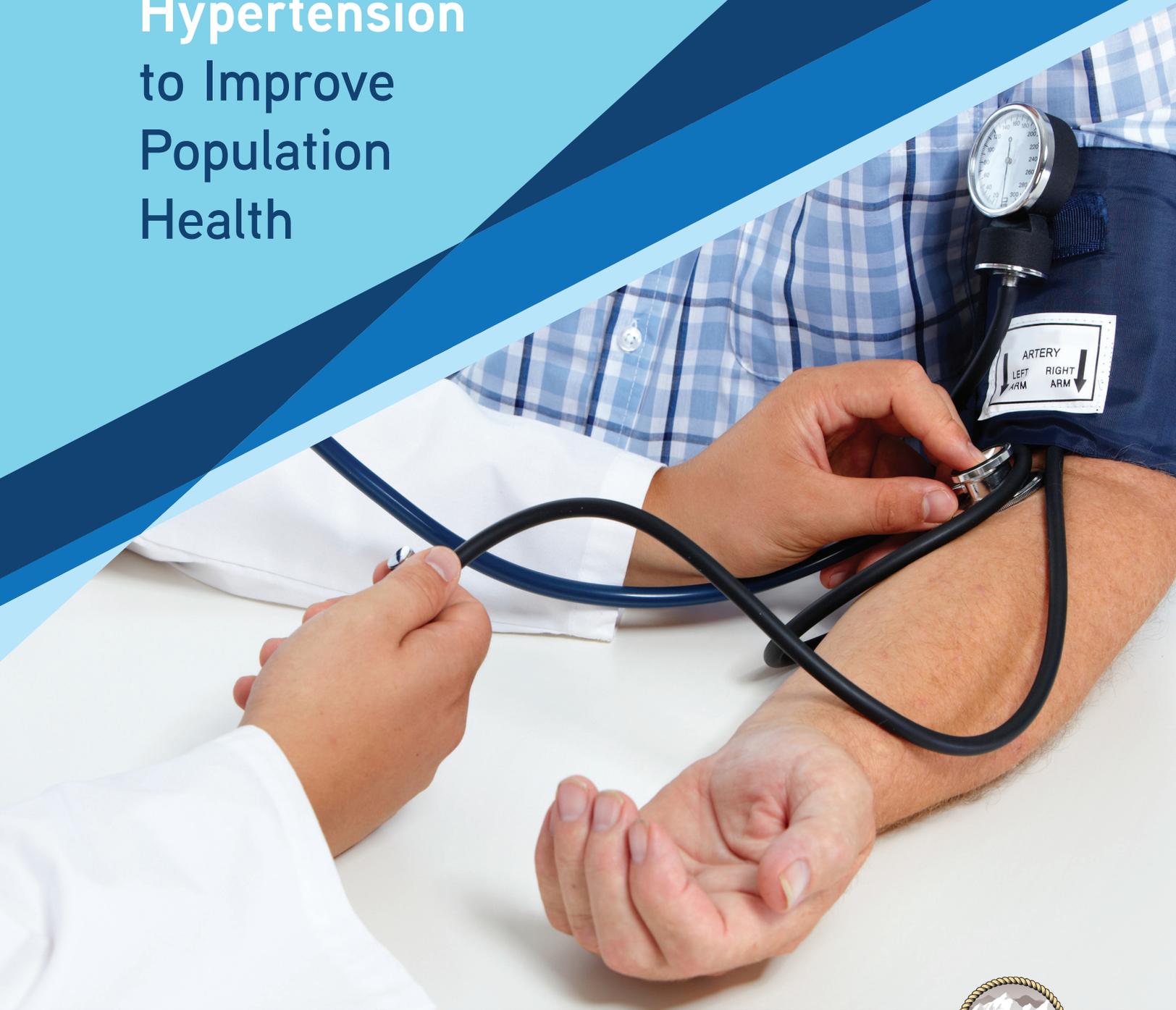
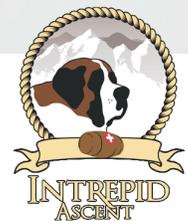


# Identifying Patients with Undiagnosed Hypertension to Improve Population Health



SAN JOAQUIN COUNTY  
**Public Health Services**  
*Healthy Future*



# 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 stroke<sup>1</sup>, with an estimated 13 million U.S. adults with hypertension, not even aware they have the condition and are not being treated<sup>2</sup>. Many of these patients reportedly have health insurance and see their providers at least twice per year but remain undiagnosed<sup>3</sup>. 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. 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 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.

<sup>1</sup> Nwankwo T, Yoon SS, Burt V, Gu Q. Hypertension among adults in the US: National Health and Nutrition Examination Survey, 2011-2012 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.

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

<sup>3</sup> 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  $\geq 140$ mmHg SBP or  $\geq 90$ 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?

## Implementing Steps to Impact the Patient Population

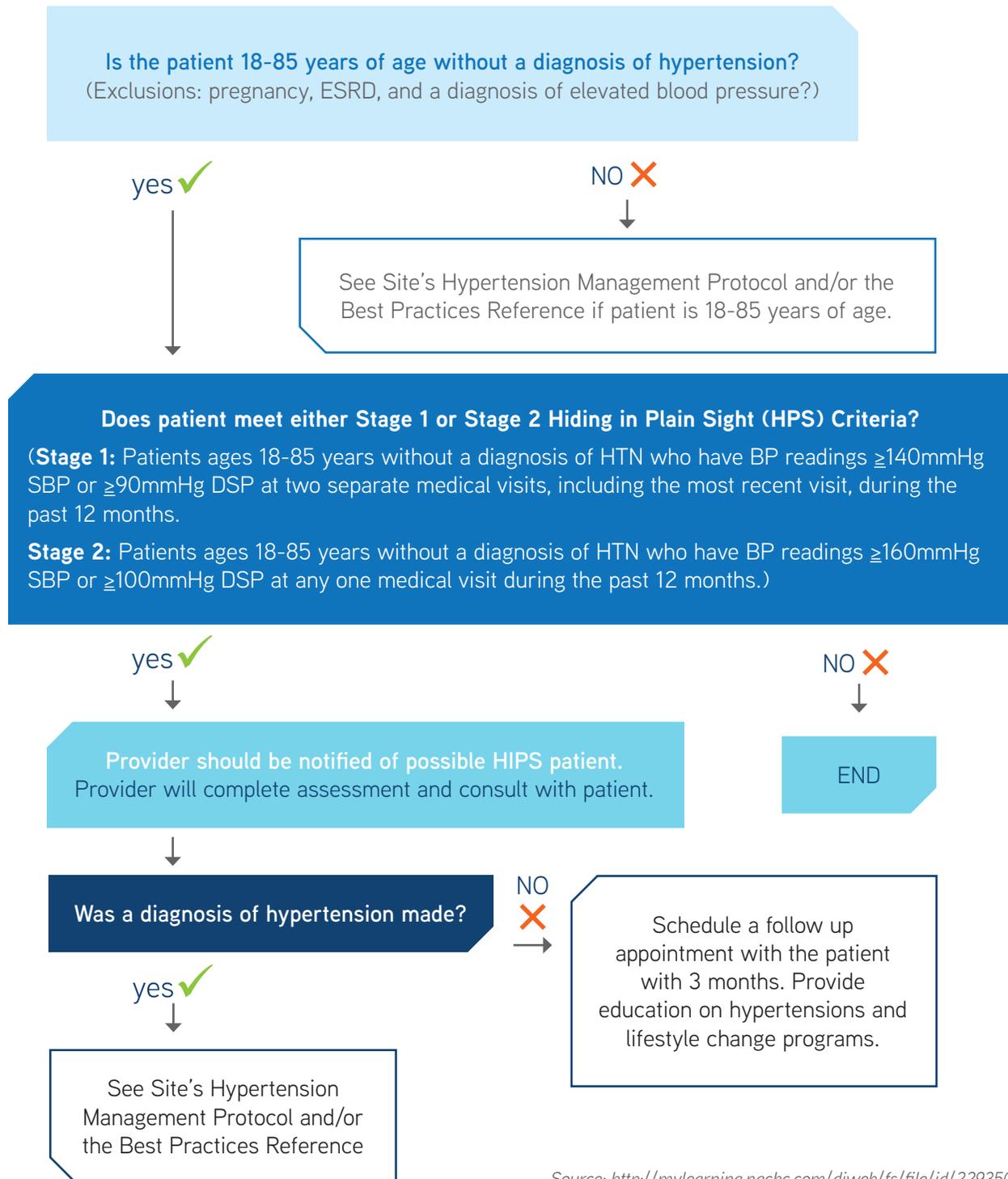
**Step 1:** Utilize national or provider-specific guidelines to screen individuals at the point-of-care for possible undiagnosed hypertension

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<sup>4</sup>” (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.

---

<sup>4</sup><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)<sup>5</sup> 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  $\geq 140$ mmHg SBP or  $\geq 90$ 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  $\geq 160$ mmHg SBP or  $\geq 100$ mmHg DSP at any one medical visit during the past 12 months.

---

<sup>5</sup><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  $\geq 140$  mm Hg or a mean DBP  $\geq 90$  mm Hg and reading at the most recent encounter was SBP  $\geq 140$  or DBP  $\geq 90$  mm Hg
2. Patients whose 3 most recent encounters yielded a mean SBP  $\geq 140$  mm Hg or a mean DBP  $\geq 90$  mm Hg and reading at the most recent encounter was NOT SBP  $\geq 140$  or DBP  $\geq 90$  mm Hg
4. Patients satisfying algorithm 1 or having a reading at the most recent encounter of SBP  $\geq 180$  or DBP  $\geq 100$  mm Hg
3. Patients who had 3 encounters with a SBP  $\geq 140$  or DBP  $\geq 90$  mm Hg within 12 months before their most recent encounter
4. Patients satisfying algorithm 4 or having an encounter with a SBP  $\geq 180$  or a DBP  $\geq 100$  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  $\geq 140$  or 2 diastolic measures  $\geq 90$ ).

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  $\geq 18$  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 Management<sup>6</sup> 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.

---

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

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

# 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.

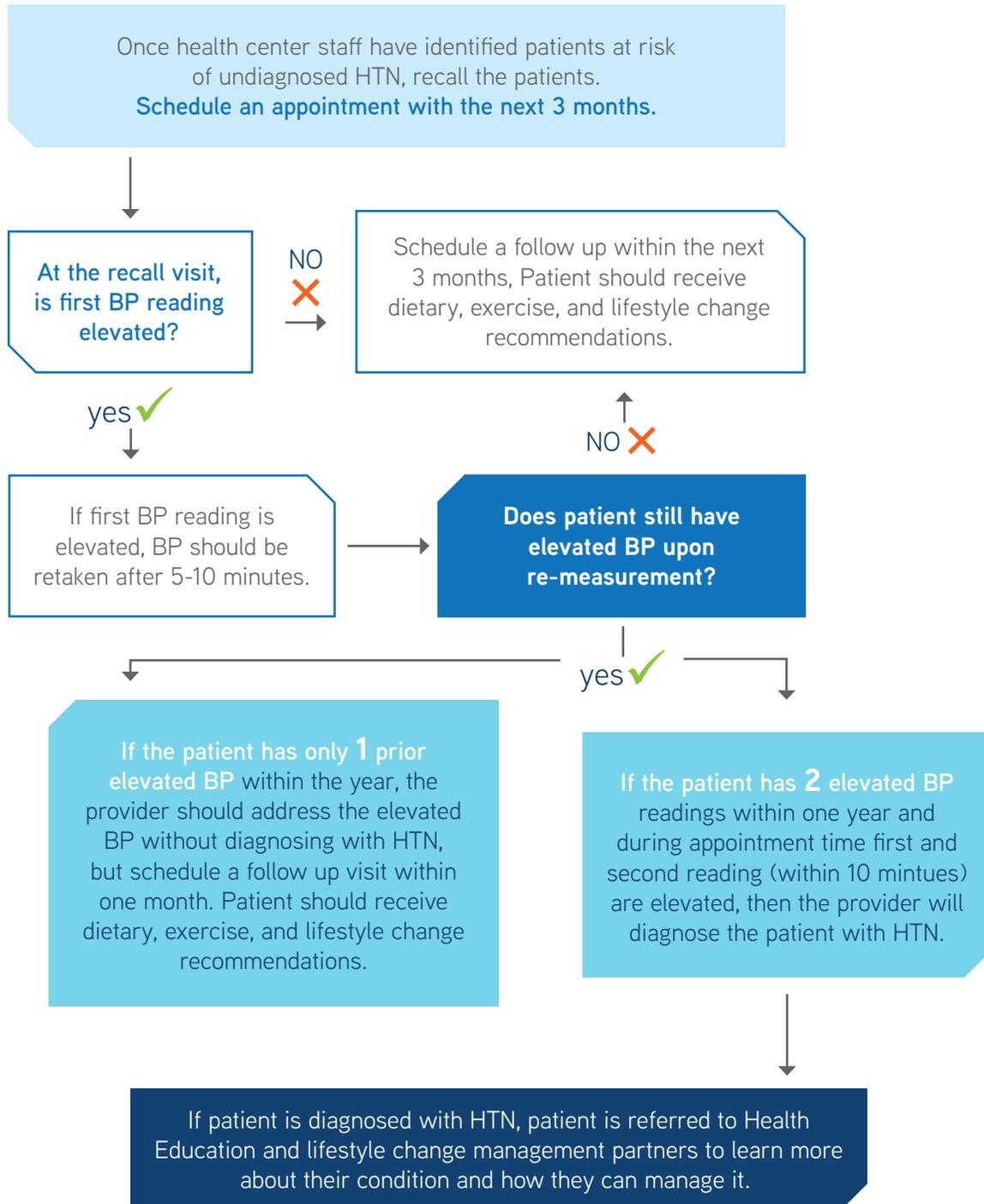
**Outreach/recall**, refers to reaching out to assigned patients who do not have scheduled visits. For example, a data analyst can provide a list to the panel manager of patients assigned to a provider’s panel who have care gaps—i.e., need a preventive screen or are overdue for a chronic care management 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>