



Multidisciplinary Approach to Enhance Control of Blood Pressure in Essential Hypertension patients

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Author and co-authors that they do not have any conflicts of interest.



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01 Problem

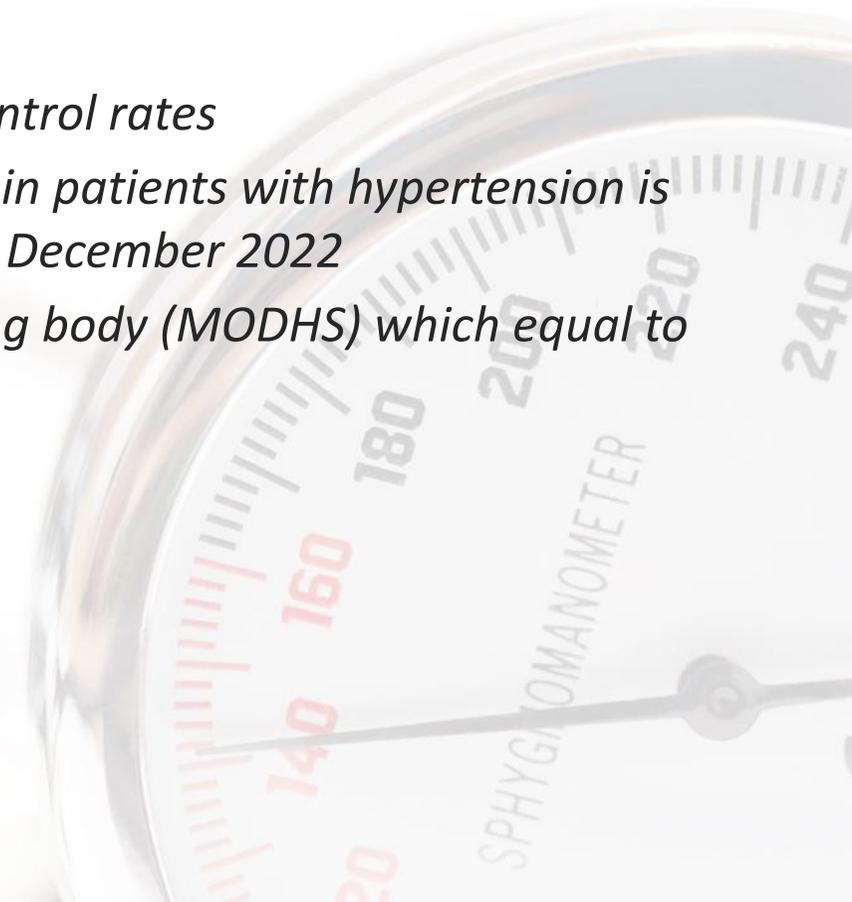
1. Hypertension complications
2. Controllable condition
3. Associated with an economic loss





Problem

- *Appropriate hypertension management results in fewer health consequences for patients and a lighter load on the healthcare system*
- *It is frequently underdiagnosed, undertreated, or poorly controlled*
- *Its frequency among adults has been increasing*
- *Hypertension is a highly prevalent disease in Saudi Arabia with poor control rates*
- *We found in our hospital that the average of controlled blood pressure in patients with hypertension is fluctuating between 55% to 63% during the period from July 2022 to December 2022*
- *This level of performance is falling below the target set by our governing body (MODHS) which equal to $\geq 68\%$.*



02

Available Knowledge

1. Quality of health care
2. Saudi Vision 2030
3. The Health Sector Transformation Program
4. The definition
5. Statistics of Hypertension
6. Prevalence of HTN





Available Knowledge

- *Improving patient care has become a priority for all health care providers with the overall objective of achieving a high degree of patient satisfaction*
- *On April 2016 the government of Kingdom of Saudi Arabia announced Saudi Arabia's Vision 2030*
- *The vision 2030 was built on three pillars that draw on KSA's intrinsic strengths Vibrant Society, Thriving Economy and An Ambitious Nation*
- *Vibrant society with fulfilling and lives which include living healthy, being healthy Improve healthcare service, Promote a healthy lifestyle, Improve livability in Saudi cities*
- *The Improve healthcare service include three objectives which is*
 - **Ease the access to healthcare services,**
 - **Improve value of healthcare services**
 - **and Strengthen prevention against health threats.**



The Health Sector Transformation Program

- *The Health Sector Transformation Program was established to contribute to the realization of the “Vibrant Society”, one of the main pillars of the Kingdom’s vision 2030*
- *The program will work to achieve improved health and healthcare services and also work to complete the implementation of the four strategic objectives*
- *The strategic objectives are:*
 - Facilitating access to health services,
 - Improving the quality of services
 - Improving of efficiency of services,
 - Promoting prevention of health risks



The background of the slide is a dark blue-tinted image showing a medical professional's hands using a stethoscope. In the foreground, there is a blurred image of several white, oval-shaped pills. On the right side, a portion of a silver sphygmomanometer is visible, with its dial showing pressure readings in mmHg. The dial has markings for 140, 160, 180, 200, 220, and 240. The needle is positioned between 140 and 160. The word 'SPHYGMOMANOMETER' is printed on the dial.

Improve quality and efficiency of healthcare services

- *This objective focuses on enhancing the quality and efficiency of healthcare services and free insurance for citizens by supporting the sector's response to the health needs and expectations of the community, and by promoting safe, effective and financially sustainable health coverage.*



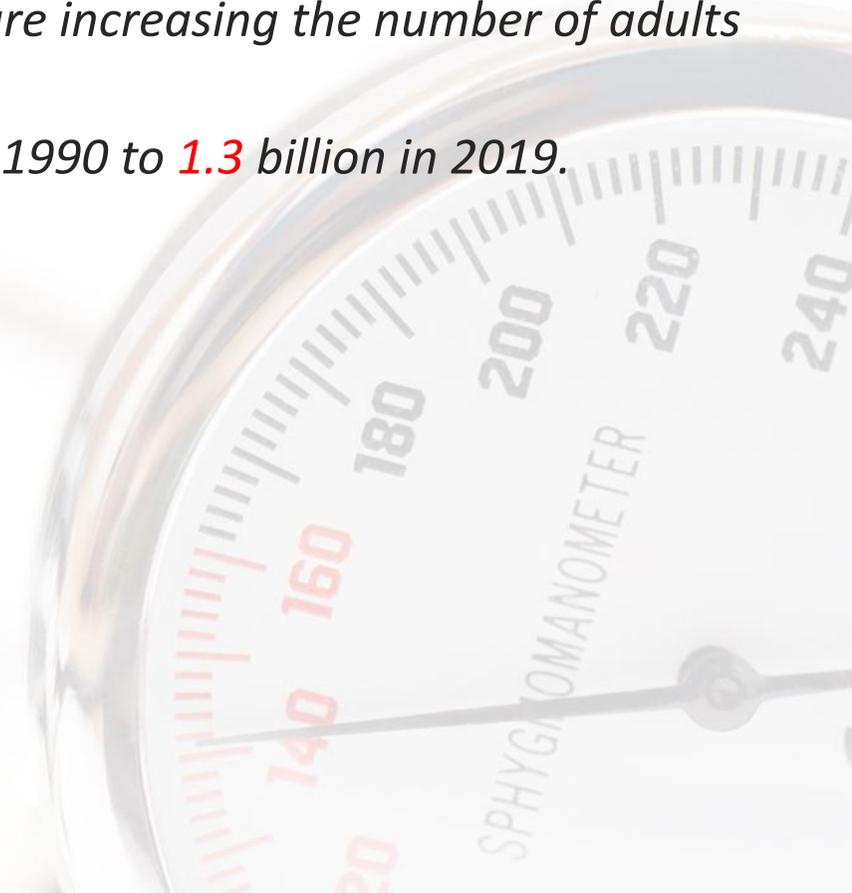
Hypertension

- *Hypertension is defined as having (SPB) ≥ 140 mmHg or (DPB) ≥ 90 mmHg or taking medication for hypertension.*
- *Uncontrolled hypertension is when SBP ≥ 140 mmHg or DBP ≥ 90 mmHg.*





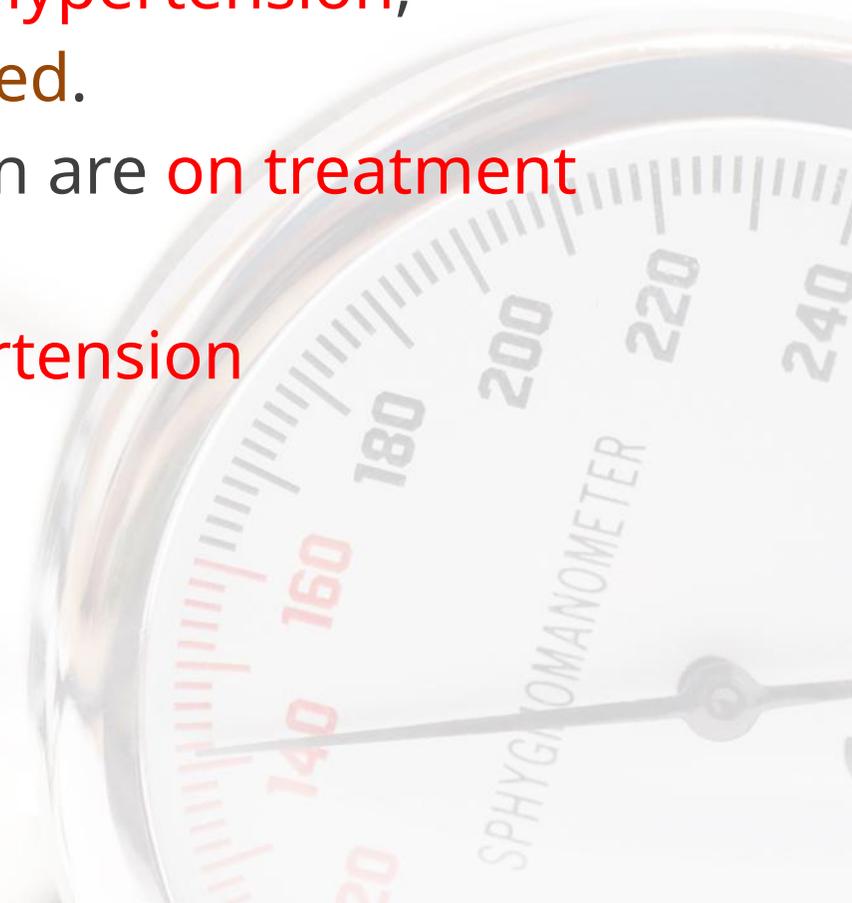
- The **total number of adults in the world is increasing** as a result of population growth and because the age structure of the population is shifting, with older groups accounting for a larger proportion of the total population.
- Since the rate of hypertension **increases with age**, these two trends are increasing the number of adults aged 30–79 years with hypertension.
- The number of adults with hypertension **doubled** from **650** million in 1990 to **1.3** billion in 2019.





Prevalence of HTN

- Hypertension is a highly prevalent disease in Saudi Arabia with poor control rates.
- According to WHO report about hypertension
 - 34% of the population of Saudi Arabia have hypertension,
 - 51% of them diagnosed and 49% undiagnosed.
 - 41% of patients with diagnosed hypertension are on treatment
 - 10% untreated,
 - for those on treatment 21% controlled hypertension



03

Rationale & Specific Aim

1. Rationale

2. Specific Aim





Rationale

- *Significant problem with controlling hypertension due to we are the below of the target set up by the governing body. (MODHS)*
- *The percentage of controlling blood pressure continues fluctuating below the target between 55% and 63%.*
- *We hypothesized that there was insufficient time for the health care provider due to the increased number of family medicine clinics and increased patients following in family medicine clinics with wide range of the diseases and multiple task required to be done in the clinics by the health care provider.*
- *We theorized that implementation of a multidisciplinary approach and intervention to apply would result in substantial improvement controlling hypertension*



Specific Aim

- *Increase the percentage of controlled blood pressure of adult patient age from 18 years to 85 years with Hypertension to $\geq 68\%$ in patients following in Family Medicine Clinics in Prince Mansour Military Hospital (PMMH) by the end of September 2023.*



04 Context

1.PMMH

2.Accurate measurment

3.Early Detection of HTN and management

4.Cardiovascular risk





PMMH

- *Prince Mansour Military Hospital (PMMH) is governmental hospital in the Kingdom of Saudi Arabia.*
- *It is also the first military hospital for the Saudi armed forces in the Kingdom, which was built in 1371 AH and opened in 1372 AH corresponding to 1952 AD.*
- *The Prince Mansour Military Hospital located in the heart of Taif city.*
- *The hospital provides the health care for patients at family medicine clinic and consider as primary health care center.*
- *The family medicine clinics in Prince Mansour Military Hospital (PMMH) provide health care for more than 200,000 patients per year*





- *The starting point for living well with hypertension is early diagnosis. The longer a person lives with undiagnosed and inadequately treated hypertension, the worse the health outcomes are likely to be.*
- *Easy and sustained access to basic validated automated blood pressure measuring devices in primary health care facilities is therefore essential, and diagnosis should be available in primary health care settings.*
- *Blood pressure measurements should be conducted by a trained staff member in a standardized way, with an appropriate cuff and the patient comfortably seated with their back supported, an empty bladder and legs uncrossed.*
- *It is efficient and acceptable to conduct two blood pressure readings at first and use results of the second reading to guide decisions about the need to schedule a follow-up visit to complete the diagnostic work-up.¹⁰*

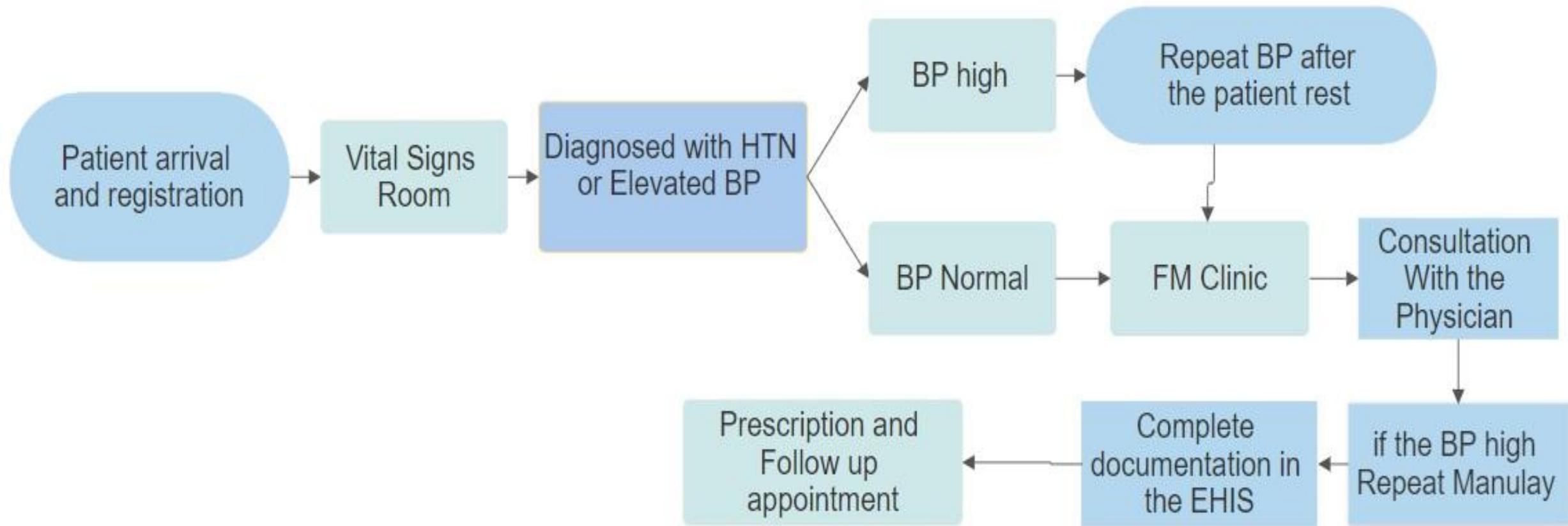




- *An important first step for reducing cardiovascular risk is accurately identifying patients with elevated BP, allowing prescription of interventions for reducing BP.¹³*
- *Because it is usually asymptomatic, hypertension has appropriately been labeled the “silent killer”; unless their blood pressure is measured, most people will be unaware of their condition until they have a clinical complication such as a heart attack, stroke or kidney failure.¹⁰*



Patient flow during the visit in Family medicine clinics



05 Interventions

1. Increase Awareness

2. Standardize the care

3. Reminder

4. Monitoring the Equipment



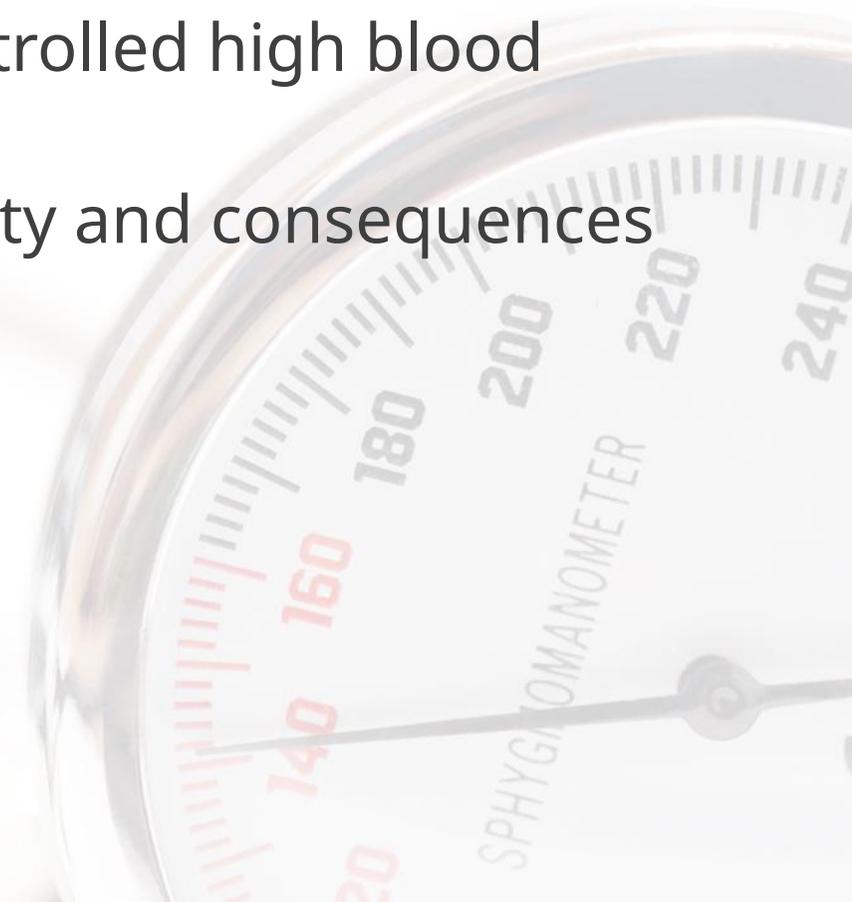


- *The improvement project was conducted in 2023, focusing mainly on controlling of high blood pressure by using multidisciplinary team*
- *The main objective is to increase the percentage of patients with controlled blood pressure by*
 - monitoring and calibration the equipment,
 - reminder the staff if high blood pressure,
 - standardization of the care
 - and increase awareness of patients and staff



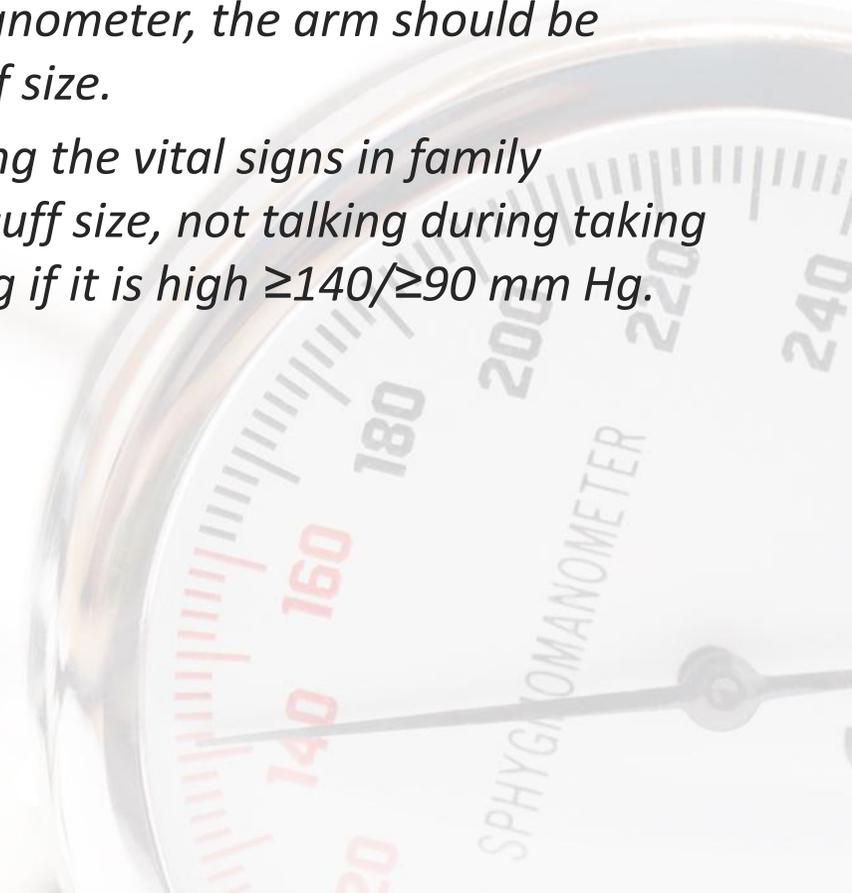


- *The change packages will utilize the guidelines and best practices that have been proven successful.*
- *The project will be implemented on the patients with high blood pressure in family medicine clinics departments with*
 - short-term objectives : of improving the controlled high blood pressure in patients with Hypertension
 - long-term objectives: of decreasing morbidity and consequences of uncontrolled High blood pressure.





- *The project concentrates to increase the percentage of controlled Blood pressure in patient with Hypertension by improving the process of care.*
- *First evaluate equipment and exam rooms by available of blood pressure equipment validated and calibrated well, comfortable chair positioned next to the sphygmomanometer, the arm should be supported at heart level and there are an adult and a large adult cuff size.*
- *Second accuracy of BP reading and technique when the nurse is taking the vital signs in family medicine clinics by making sure the patient is sitting well , accurate cuff size, not talking during taking BP measurement , right position of the patient and repeat BP reading if it is high $\geq 140/\geq 90$ mm Hg.*





- *Our intervention to use the hypertension form during the visit of patient to the family medicine clinic*
- *Register the BP reading in the hypertension form (which contains two sections; one section fill by the nurse, the other section fill by the physician) and in the electronic health information system (EHIS) by nurse.*





Hypertension form

Hypertension						
By Nurse	Patient Name:			Medical Record #:		
	Physician name & code					
	Date	VITAL SIGNS				
		BP Target: < 140/90 (diabetes or kidney disease < 130/80)	Temp	Pulse	Pain	O2
	R	2 nd reading if High				
	L			/10		
By Physician	CV Risk Factors	Modifiable : <input type="checkbox"/> Diabetes <input type="checkbox"/> Dyslipidemia <input type="checkbox"/> Hypertension <input type="checkbox"/> Smoking <input type="checkbox"/> BMI > 25 <input type="checkbox"/> Lifestyle sedentary				
		Non-modifiable: <input type="checkbox"/> Family history CHD <input type="checkbox"/> Personal history CHD <input type="checkbox"/> Age: Female > 65 Male > 55 <input type="checkbox"/> ESRD				
	Patient on statins in last 12 months <input type="checkbox"/> Yes <input type="checkbox"/> No			ASCVD Risk %		
	eGFR= Target > 60 mL/min					



- *The hypertension form modified during our intervention of the project to make it simple and effective for our goal.*





The modified Hypertension Form

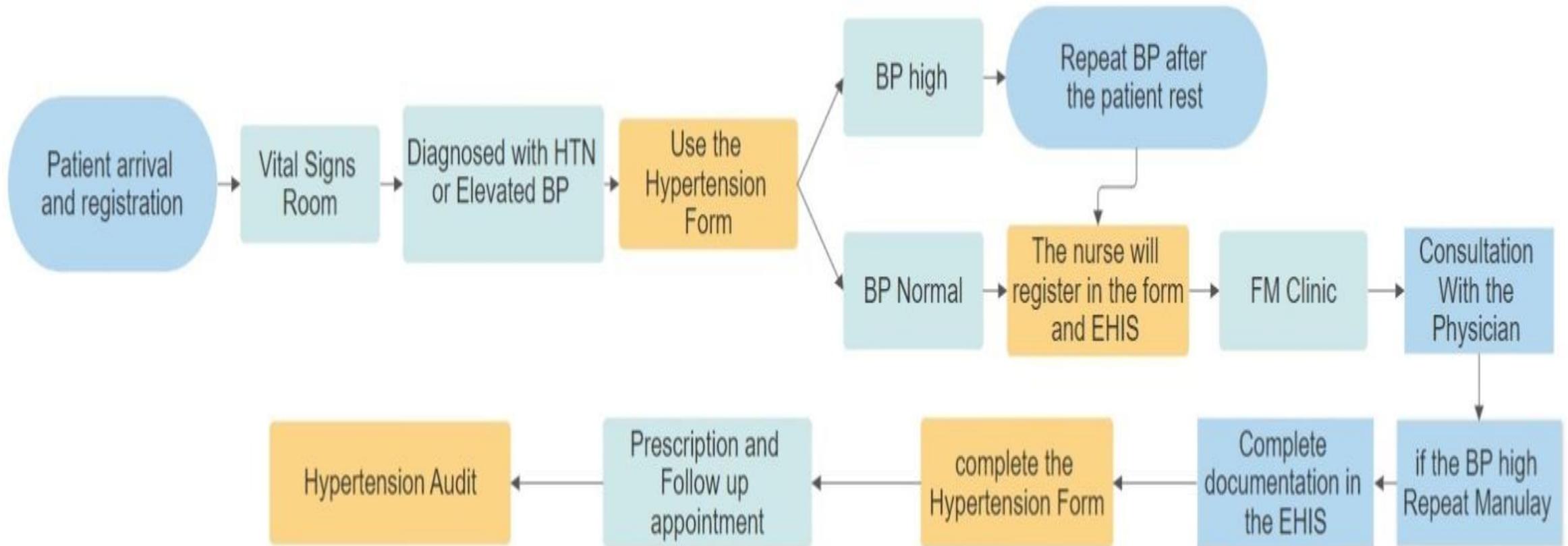
Hypertension						
By Nurse	Patient Name:			Medical Record #:		
	Physician name & code					
	Date	VITAL SIGNS				
		BP Target: < 140/90 (diabetes or kidney disease < 130/80)	Temp	Pulse	Pain	O2
	R	2 nd reading if High				
	L			/10		
By Physician	Management	Intensification : <input type="radio"/> Done <input type="radio"/> Not Done				
		healthy lifestyles given : <input type="radio"/> Yes <input type="radio"/> No				
	Follow up after:					



- *The project will increase awareness of patients by involvement of the care and sharing with them the plan, educate them about the important of controlling BP, the nature of the disease, self-assessment of blood pressure, physical activity and healthy diets.*

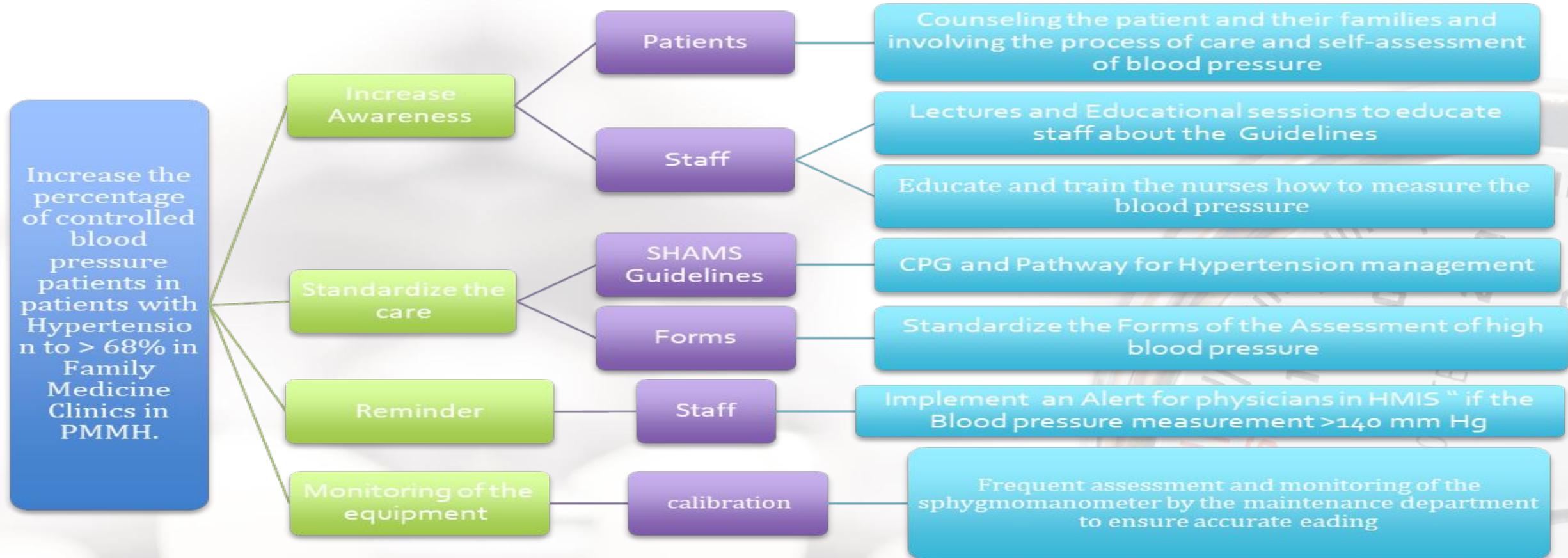


The patient flow after our intervention during the visit





The ideas for initial tests of change



Implementing New Techniques

Innovative Techniques for Hypertension Management



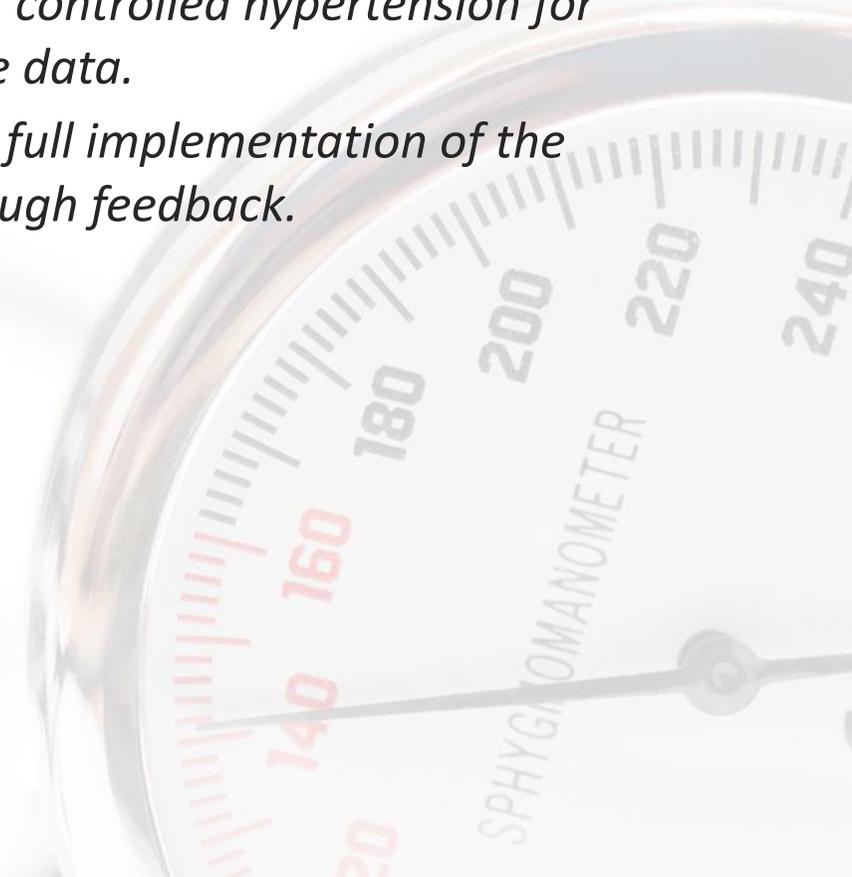
This timeline highlights key advancements in hypertension management techniques.





Study of the Intervention

- *We use a quasi-experimental study design that compared retrospective data pre-intervention to prospective data post-intervention.*
- *Our study design enabled us to assess whether the observed outcomes were due to the interventions or some other causes (internal validity) by comparing the Percentage of controlled hypertension for patients aged 18 to 85 years after intervention with the retrospective data.*
- *Monthly reporting with the healthcare team permitted us to test the full implementation of the planned interventions and their impact on the system outcomes through feedback.*



06 Measures

1. Outcome Measure

2. Process Measures

3. Balancing Measure





Outcome Measure

- *The impact of the interventions was assessed using a comprehensive measurement system.*
- *The percentage of patients with controlled blood pressure in family medicine clinics age from 18 to 85 years.*
- *This measure was directly related to our aim and enabled us to gauge the success of our improvement efforts. For data collection, we adopted the operational definition for this measure that was endorsed to us by MODHS (our governing body).*





Process measures

- *Our Process measures evolved with the progress of the project and they were specifically designed for the purpose of our initiative.*
 - The percentage of trained physicians on guidelines and pathways of management of high blood pressure,
 - The percentage of trained nurses on accurate measuring the blood pressure,
 - The percentage of patients screened for high blood pressure in family medicine clinics
 - The compliance rate of physicians to the notification of High blood Pressure
 - The compliance on the guidelines on management of hypertension



These process measures allow us to not only assess the effectiveness of our educational and standardization efforts but also ensure that our physicians and nurses are following the guidelines





Balancing Measure

- *The number of patients with signs or symptoms of hypotension who complain of dizziness and hypotension after intensification of medication.*





Analysis

- *Descriptive analyses of the quantitative measures collected over time were reported as run charts. The data were analyzed by using Microsoft Excel. We employed a run chart to analyze the Percentage of controlled hypertension for patients aged 18 to 85 years.*
- *We also utilized the T-test Paired Two Sample for Means to check any statistically momentous difference in the Percentage of controlled hypertension pre and post-intervention. P value was calculated and the significant level was adjusted at 5% (P value < 0.05 means statistically substantial difference).*
- *The presentation of data of process measures as well as our balancing measure by means of bar graphs enabled us to analyze our performance in relation to these parameters. Trend lines were adopted to monitor the progress in performance pertaining to the later set of measures.*

07 Results

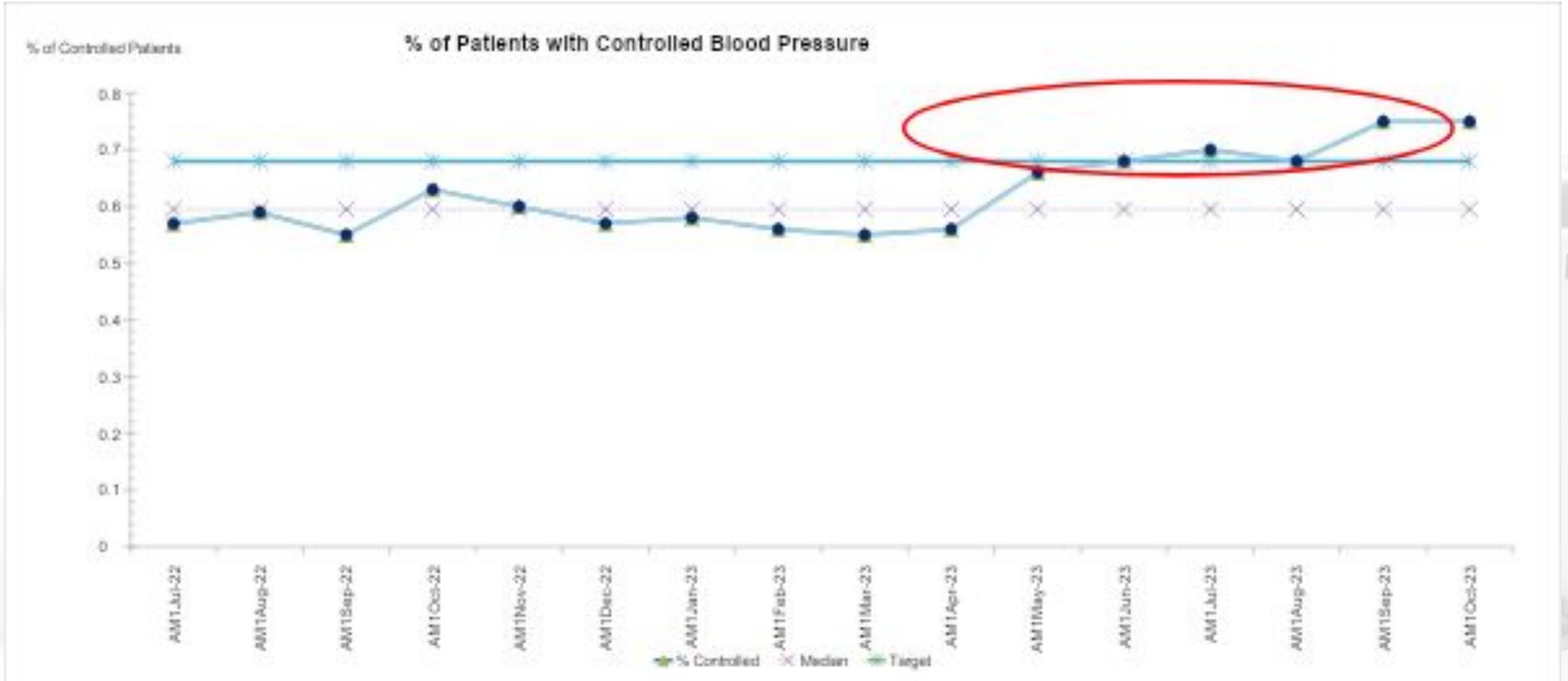




Results

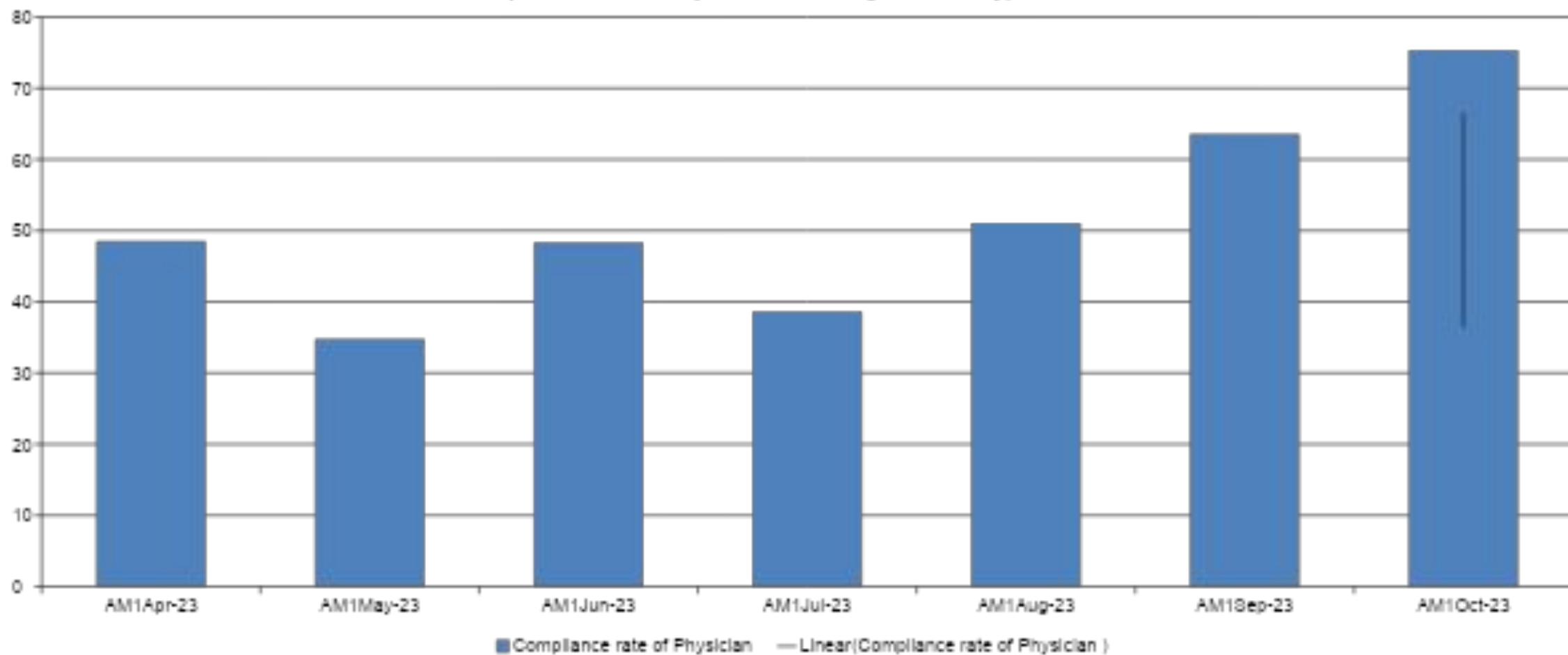
- *Regarding the outcome of our interventions, we collected data on the percentage of patients with controlled blood pressure in family medicine clinics age from 18 to 85 years.*
- *Results were not satisfactory during the January-April 2023.*
- *Improvement started in May 2023 and improving in up trending May 2023 as well as the sustainability phase May-October 2023 at better levels as compared before April.*
- *The target $\geq 68\%$ was achieved in May 2023 and maintained through October 2023 which reach 75% of the controlled hypertension*
- *Analysis of the results using a run chart showed a shift with 6 consecutive data points above the median during the period from May to October 2023 which indicates a special cause variation that could be linked to our intervention.*
- *P value was 0.032 which means that the Percentage of patients with controlled blood pressure results post-intervention are significantly different from pre-intervention results which could be also linked to the success of our interventions.*

The percentage of patients with controlled blood pressure



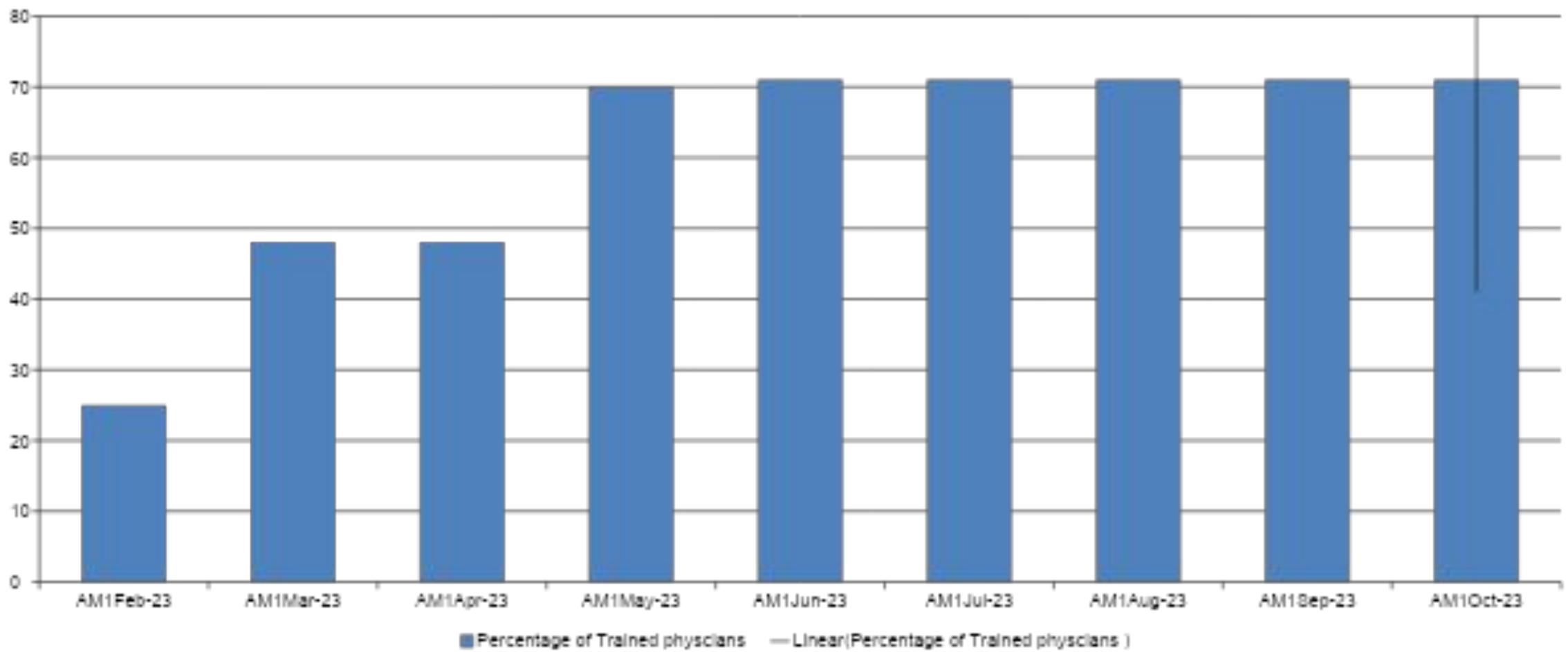


Compliance rate of Physician on Management of Hypertension



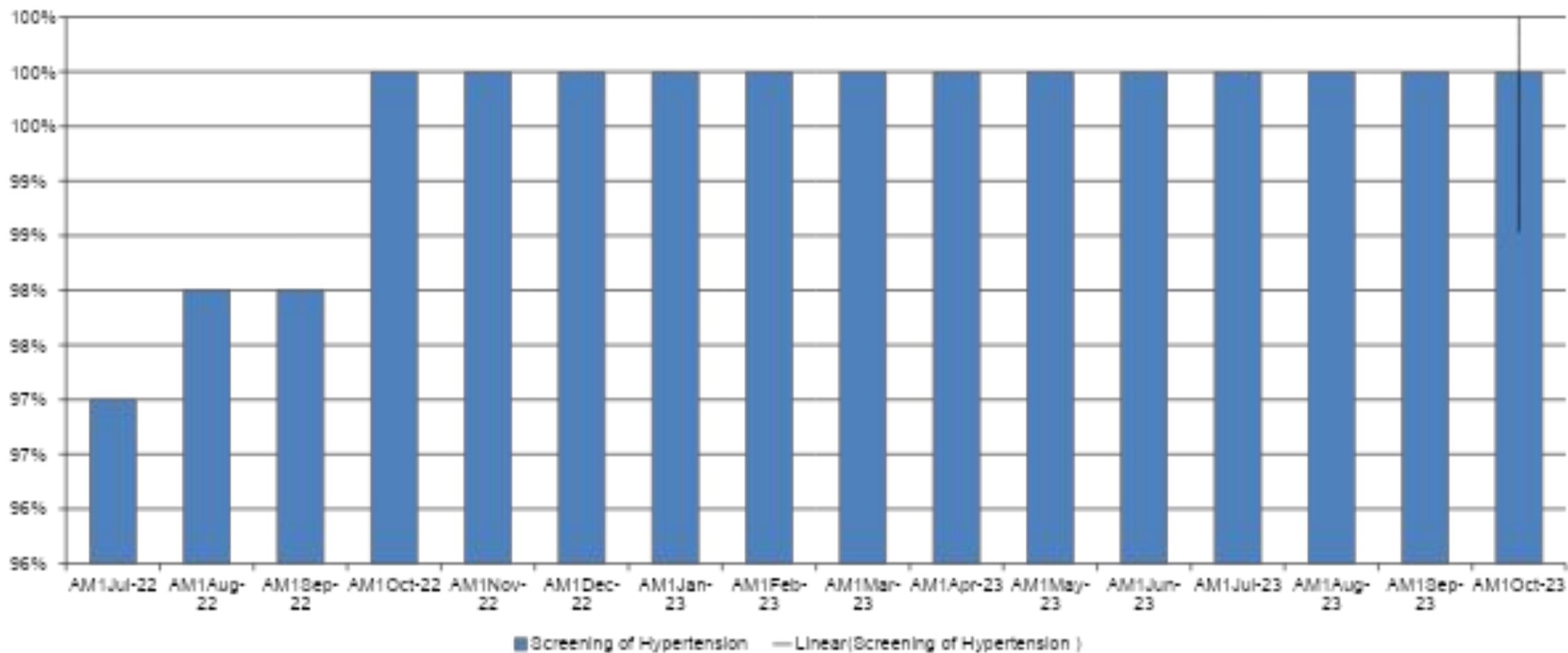


- *Data on the compliance rate of physicians on management of hypertension showed progressive improvement as indicated by the upward trendline.*
- *The target of provision of compliance rate of physicians on management of hypertension is 90% of the targeted physician wasn't achieved by the end of September 2023.*
- *By the end of October 2023 we achieve 71% .*
- *This could be correlated with the improvement in our outcome measure that occurred in May 2023 and was maintained during the sustainability phase*





- *Similarly, Data on the percentage of trained physicians on guidelines and pathways of management of high blood pressure showed progressive improvement as indicated by the upward trendline*
- *This could be also correlated with the improvement in our outcome measure that occurred In May 2023 and was maintained during the sustainability phase.*





- *Despite we didn't achieve the target of controlled hypertension until June 2023, the percentage of screening of hypertension reached our 100% target in October 2022, before our starting of our intervention in the beginning of the year 2023 and was maintained until October 100%.*
- *The percentage of trained nurse on accurate measurement of blood pressure is 100% from May 2023 and maintained until October 100%.*
- *Our balancing measure which is the number of patients with signs or symptoms of hypotension remain Zero until October 2023.*



Summary

- *Our quality improvement project aims to optimize the controlling of hypertension through increased the percentage of controlled blood pressure of adult patient age from 18 years to 85 years with Hypertension.*
- *Recognizing the importance of minimizing the risk of serious complications, reducing morbidity and mortality, and mitigating financial impacts on healthcare facilities, we addressed the challenge of achieving controlled hypertension in outpatient family medicine clinics in secondary hospital.*
- *Our project demonstrates a feasible clinical process for achieving and sustaining of the percentage of controlled hypertension from 55% to 75%. By multidisciplinary team approach, we are committed to improving the overall of controlled hypertension, contributing to enhanced patient outcomes, and alleviating the burden on healthcare facilities.*

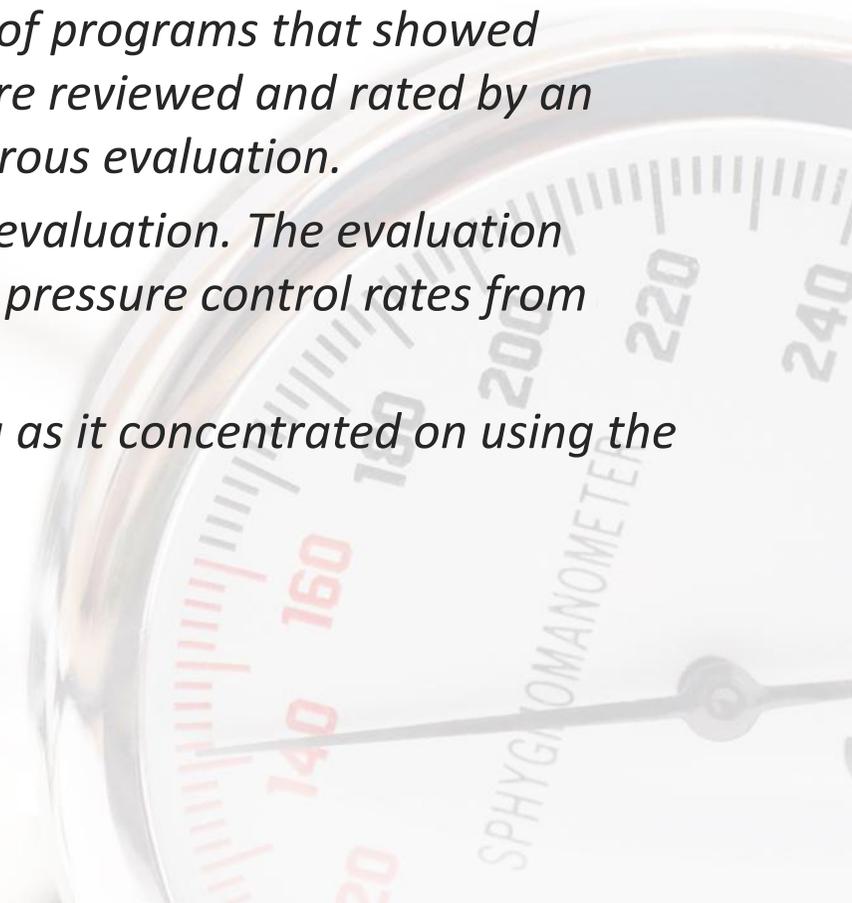


Interpretation

- *Results for the percentage of controlled hypertension for patients aged 18 to 85 years during the period from July 2022 to December 2022 was fluctuating from 55% to 63% , falling below the target of our governing body which is $\geq 68\%$.*
- *After we using the form and establish of the intervention, there is an improvement and continuity of the percentage of controlled hypertension started in April 2023, despite previously that it is fluctuating didn't achieving the target.*
- *Our approach involved to remind the health care provider using hypertension form and alert if high blood pressure leads to effective management and focusing on standardized care.*
- *By focusing on education, increase awareness, standardize the care, reminder of the healthcare provider and frequent monitoring the equipment, we are committed to improving the for the percentage of controlled hypertension , contributing to enhanced patient outcomes, and alleviating the burden on healthcare facilities.*

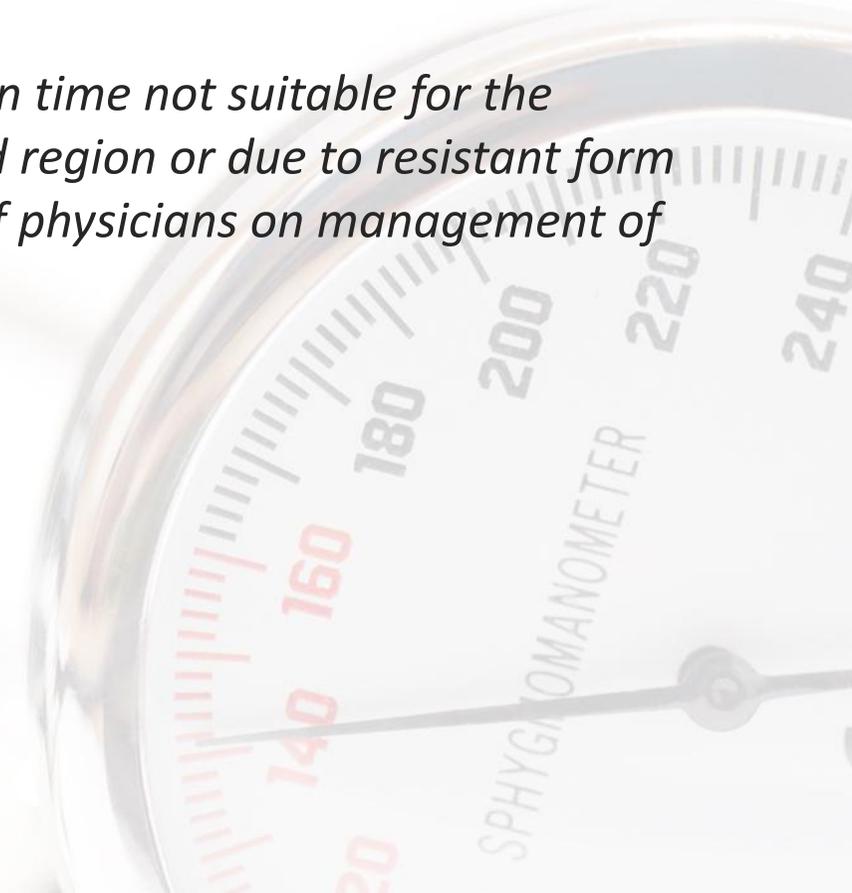


- *One of the effective strategies for increasing of controlled hypertension is The Hypertension Management Program (HMP) is modeled after Kaiser Permanente Colorado's (KPCO) Hypertension Management Program and packaged by CDC.*
- *The program was identified through a 2009 evaluability assessment of programs that showed promise in the area of hypertension management. The programs were reviewed and rated by an expert panel to determine the promise and readiness for a more rigorous evaluation.*
- *The KPCO HMP was determined to be well-equipped for an in-depth evaluation. The evaluation demonstrated that the program improved health system-wide blood pressure control rates from 61% in 2008 to 78% in 2010 and 83% in 2012.¹²*
- *In our intervention, we used a similar strategy, but a different setting as it concentrated on using the hypertension form and standardize the care.*





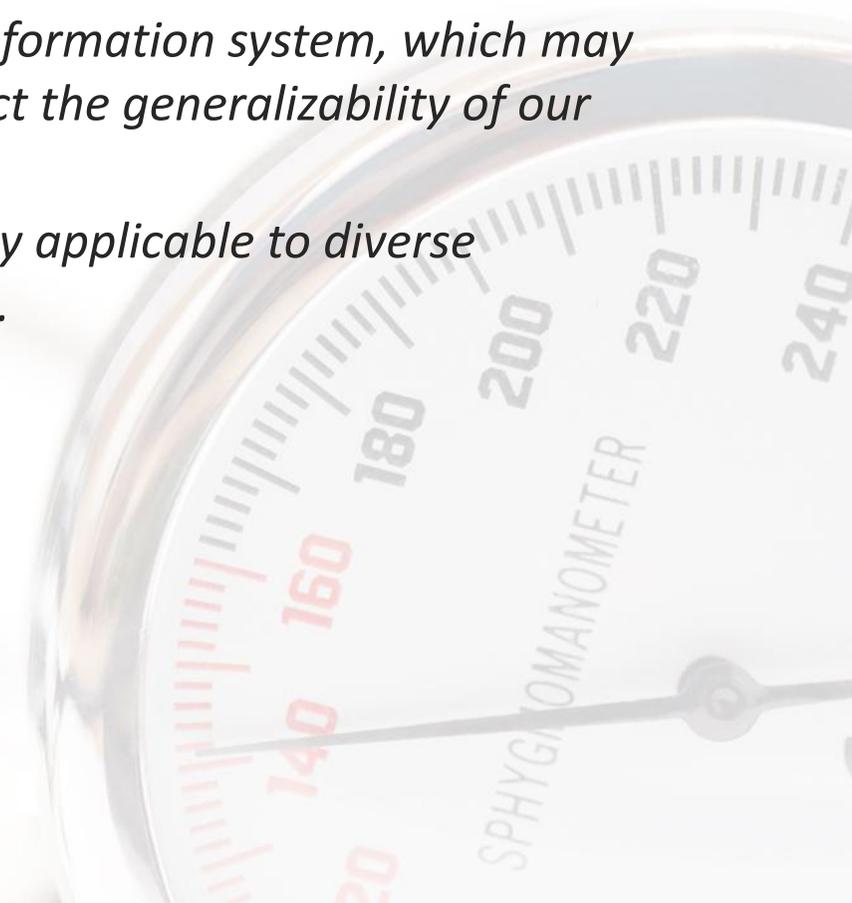
- *Most of the physician and nurse not satisfied using the hypertension form, they considered it as extra load on their work and take time to complete it.*
- *We didn't achieve our target on the percentage of trained physicians on guidelines and pathways of management of high blood pressure which is 100%.*
- *We achieve 71% in June 2023 , may be this due to the training session time not suitable for the physician , we have some physician covering outside the hospital and region or due to resistant form the physician as we didn't reach our target on the compliance rate of physicians on management of hypertension.*





Limitations

- *As our improving project done in outpatient family medicine of secondary governmental hospital who has a ability and facilitating our intervention to implement the change.*
- *Also the balancing measure could be insufficient data to be collected because there is recall bias.*
- *It's important to note that the reliance on an electronic healthcare information system, which may not be universally available in other healthcare facilities, could impact the generalizability of our interventions.*
- *Therefore, the interventions detailed in our study might not be readily applicable to diverse healthcare settings with distinct human resources and infrastructure.*





Conclusions

- *Establishing a multidisciplinary approach has significantly improved the percentage of control of blood pressure in patient with essential hypertension, reducing morbidity and mortality.*
- *The project will be sustainable by refreshing educational session and reminding the staff and frequent monitoring and auditing for hypertension, also frequent assessment, calibration and monitoring of the sphygmomanometer by the maintenance department to ensure accurate reading*
- *Our next step is to establish database of patients with high blood pressure reading and following them regularly.*
- *Development of a cross function agreement with other specialty to ensure patients receive effectively and consistent care.*
- *Establish a clinic in family medicine for those has resistant hypertension.*

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THANK YOU

