Tab 1

Final Project Proposal

**Title of your project:** Addressing Essential Hypertension Management Deficiency

**Challenge your project addresses:** This project addresses the challenge of overwhelmed Hypertension Clinics by improving the management of hypertension in primary care to reduce unnecessary referrals and ensure timely, effective treatment.

## Locate the deficiency:

Using the Synthetic MGUH dataset, we will first establish a cohort of patients diagnosed with essential hypertension. This will include patients with documented encounters, procedures, care plans, or conditions with code/description as “Essential Hypertension” (SNOMED CT: 59621000). Additionally, we will identify those referred to a cardiologist in the Hypertension Clinic, using the procedures code for “Referral to hypertension clinic” (SNOMED CT: 183856001). Next, we will identify management deficiencies in our patient cohort by focusing on patients who were referred to the Hypertension Clinic without adequate prior management in primary care. Specifically, we will look for patients who lack prescriptions for key antihypertensive medications such as Lisinopril, Enalapril, Losartan, Amlodipine, and Metoprolol, identified using relevant RxNorm codes (e.g., 29046, 4023, 5640, 197313, 6918). We will also examine whether patients have documented care plans for lifestyle modifications, identified by the code for “Lifestyle education regarding hypertension” (SNOMED CT: 443402002).

## Addressing the Deficiency (OPEN EMR WORKFLOW):

The workflow begins when a clinician opens a patient’s chart during a hypertension-related encounter. The clinician checks the **Reminders Section** to determine referral eligibility for the Hypertension Management Clinic.

If no reminder is present, the clinician can proceed with the referral. If a reminder appears, the patient is ineligible, and the clinician is prompted to complete the next steps.

A passive **reminder** will appear in the reminder section if the **Hypertension Management Form** is incomplete. This form collects key data, including exercise habits, diet education, and medication use. If incomplete, the clinician sends the form to the patient via the portal. After submission, clinical staff review the form responses, update the chart, and reassess the patient’s eligibility. If all criteria are met, the reminder clears, enabling the clinician to make the referral.

## **3. Outcome Measures to Track:**

We will track the percentage of hypertension patients referred to the hypertension clinic without prior management in primary care. Specifically, we will measure if the patients have a completed hypertension management form, thereby meeting the referral criteria. The outcome will be measured by comparing unmanaged hypertension referrals before and after implementing the new workflow, with a **25% reduction** in unmanaged referrals and **50% adherence** to the new protocol by PCPs as the success criteria. Additionally, we will track improvements in **blood pressure**, the number of **patient follow-ups**, and **cost savings** from avoided referrals and reduced specialized care visits. We will also monitor **PCP compliance** to ensure adherence to the new protocol, including the completion of the hypertension management checklist.

## **4. Implementation design:**

The new workflow will be piloted in one primary care clinic, with another comparable primary care clinic serving as a control. While there may be potential confounding variables due to differences between the clinics, this design allows us to assess the effectiveness of the intervention in a real-world setting. To minimize bias, we will select clinics with similar patient demographics and case volumes, ensuring a fair comparison.

## **5. Staff Feedback:**

Using dashboards, we can visualize the percentage of hypertension patients whose providers have completed the required management checklist since the implementation of the workflow. We can also create **individual provider performance dashboards**, showing how many patients each provider has managed with complete hypertension care, which they can compare with that of other providers. Providers can login to OpenEMR and see their performance metrics, such as **80% checklist completion** (pie chart) and **10% improvement in patient blood pressure** (scatterplot with additional calculation). Furthermore, staff will have a structured way to provide feedback on the intervention through **OpenEMR feedback forms** or **weekly team meetings**.

## **6. Addressing implementation costs:**

The PCPs will need to be trained on how to use the hypertension management checklist in OpenEMR as well as the importance of lifestyle counseling, prescription management, and proper documentation of patient data within the form. Internal staff members who are familiar with OpenEMR such as experienced PCPs and IT specialists can conduct training to **reduce external consultant costs**. We will use OpenEMR’s existing infrastructure to **avoid the cost of purchasing a new software system**. We will continue to use Tableau to provide real-time reporting, which will pull from OpenEMR, **requiring minimal additional IT resources**.

## **7. Results presentation to management**

If the pilot project is successful, our presentation to management will focus on securing approval for wide-scale deployment by showcasing key outcomes. We will highlight baseline metrics, weekly trends, and final results, emphasizing improvements in hypertension management tied to financial benefits. Success will be demonstrated through a 25% reduction in unmanaged referrals, 50% PCP adherence to the new protocol, improved blood pressure control, increased follow-ups, and cost savings from reduced referrals and specialized care visits. Additionally, we will detail the technical controls, resources used, and a forecast of the broader impact, making a compelling case for expansion**.**

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Tab 2

### **Background:**

Hypertension, commonly known as high blood pressure, is a prevalent condition that significantly increases the risk of cardiovascular diseases, such as heart disease and strokes. It is a critical public health issue that requires timely management to prevent severe complications. The standard initial approach to controlling hypertension involves lifestyle modifications, such as dietary changes, increased physical activity, and weight loss. If these measures prove insufficient, pharmacological intervention with antihypertensive medications is recommended.

In most cases, hypertension is managed by internal medicine physicians as part of routine primary care. However, when hypertension is severe or remains uncontrolled despite standard interventions, patients are typically referred to specialized Hypertension Clinics managed by cardiologists.

Currently, our health system's Hypertension Clinic is overwhelmed due to a high volume of referrals, creating challenges in staffing and patient management. To address this strain, the health system aims to shift a greater proportion of hypertension management to primary care settings. This would ensure that patients receive appropriate medical interventions early on, reducing the need for specialist referrals.

The focus of this project is to analyze our health system's electronic medical records (EMR) to identify gaps in the management of patients with essential hypertension. Specifically, the project seeks to determine the total number of adults diagnosed with essential hypertension and assess how many of these patients are being referred to the Hypertension Clinic without receiving optimal medication management in primary care. Based on these findings, we will design targeted interventions to improve the management of hypertension in primary care, thereby reducing the burden on the Hypertension Clinic and enhancing overall patient outcomes.