



**KENNEDY**

PHARMACY INNOVATION CENTER



UNIVERSITY OF  
**SOUTH CAROLINA**  
College of Pharmacy

# Implementation of a Pharmacogenomics Program at an Employer-Based Health Center

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## BACKGROUND

- The Food and Drug Administration (FDA) has pharmacogenomic information listed in the package labeling >250 medications.<sup>1</sup>
- >40% of patients achieve remission from depression with initial drug treatment<sup>2</sup>
- Those with an anxiety disorder are 3-5x more likely to go to the doctor and 6x more likely to be hospitalized for psychiatric disorders than those who do not suffer from anxiety disorders.<sup>3</sup>
- 85% of people who are diagnosed with major depressive disorder have ≥ 1 other chronic health conditions and nearly 30% have ≥ 4 other health conditions<sup>4</sup>
- A needs assessment at the health center identified a gap in services related to medication management. An analysis of medications prescribed and managed at the health center for treatment of mental health disorders indicated potential for significant patient impact and cost reduction through implementation of pharmacogenomics service.

## OBJECTIVES

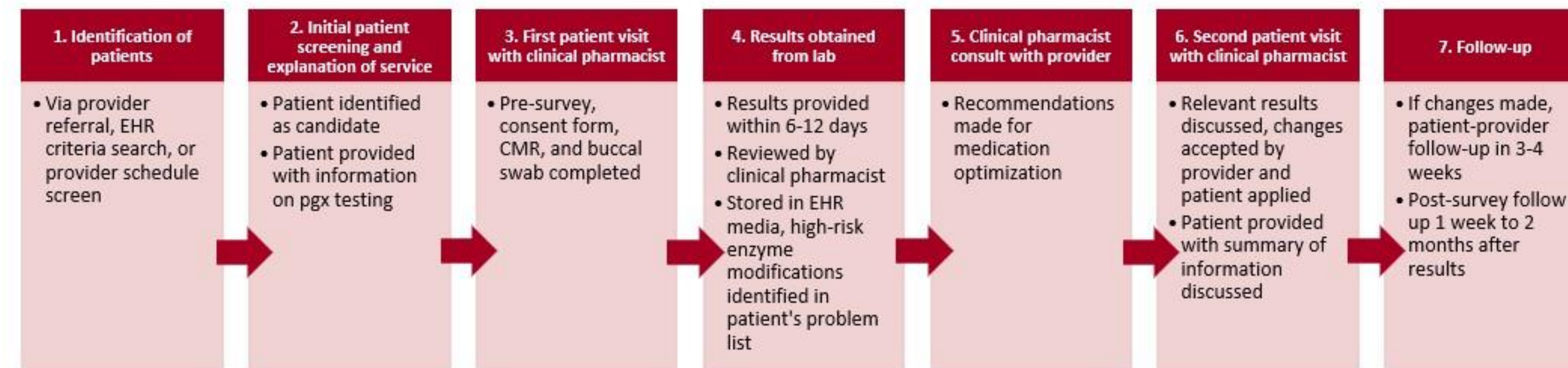
- Evaluate the impact of a pharmacogenomics service on identifying inappropriate drug therapies.
- Secondary objectives include tracking medication or dose changes based upon pharmacogenomic test results.

## METHODS

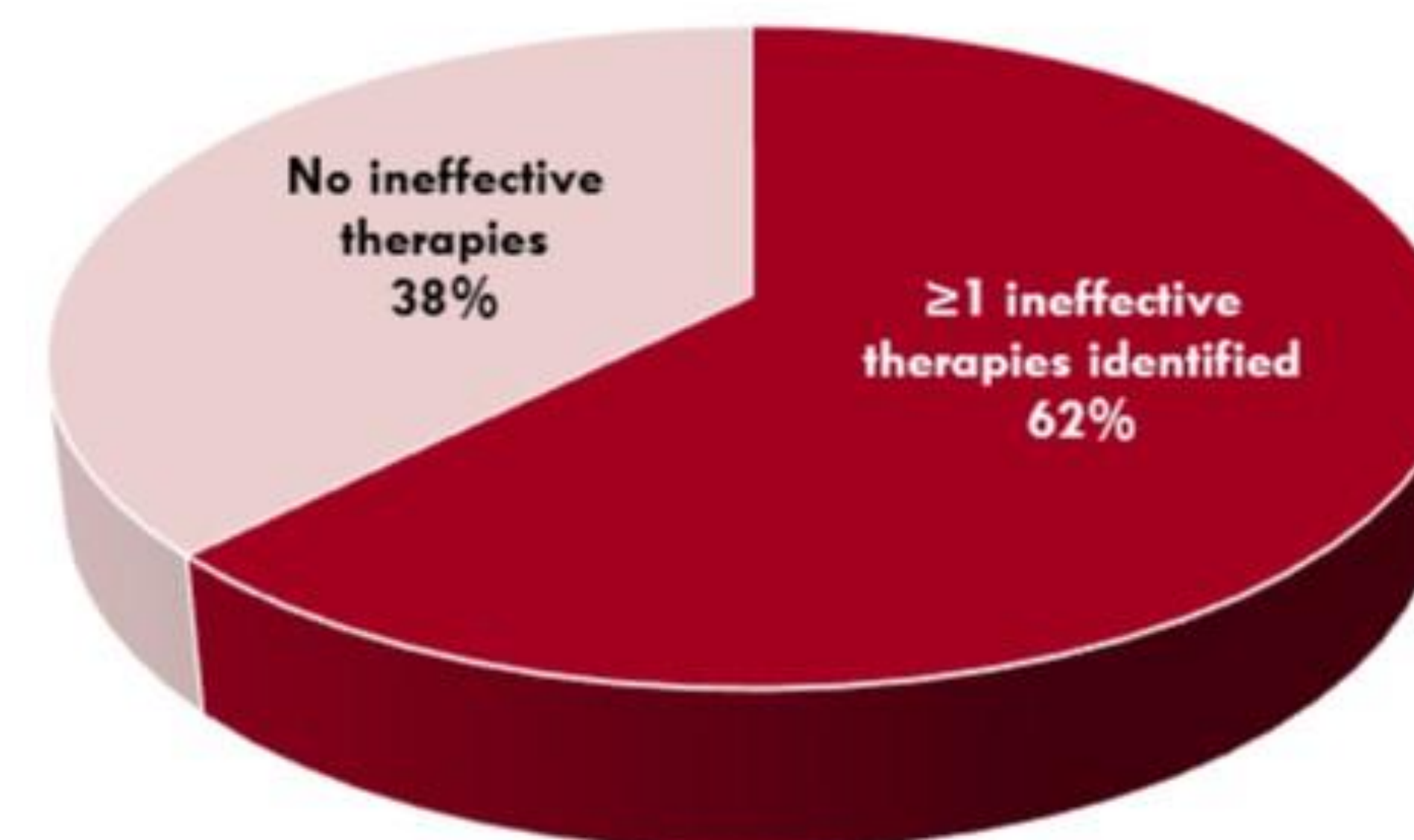
- Implementation period: August 2019-August 2020; Pilot period (40 patients): September 2020-February 2021
- An external provider of pharmacogenomics services was contracted with to provide team member training, testing, and reporting.
- Six clinical pharmacists completed a 16-hour continuing education course and platform training provided by pharmacogenomics company.
- Candidates met 1 or more of the following criteria: unmanaged mental health diagnosis, elevated PHQ-9 and/or GAD-7, history of non-response to treatment, history of adverse reactions to treatment
- Clinical pharmacists followed standardized process (Figure 1) for result interpretation, consultation with patient and provider, storage, and follow-up.
- Data aggregated and provided for 32 of 40 patients.
- Internal barriers: time for team member training, corporate-level decision making delays, debate over proper storage of results, and employer approval of pilot expense
- External barriers: considerations for protection of patient data and time for external contractor to develop site-specific materials

## RESULTS

**FIGURE 1: HEALTH CENTER WORKFLOW**

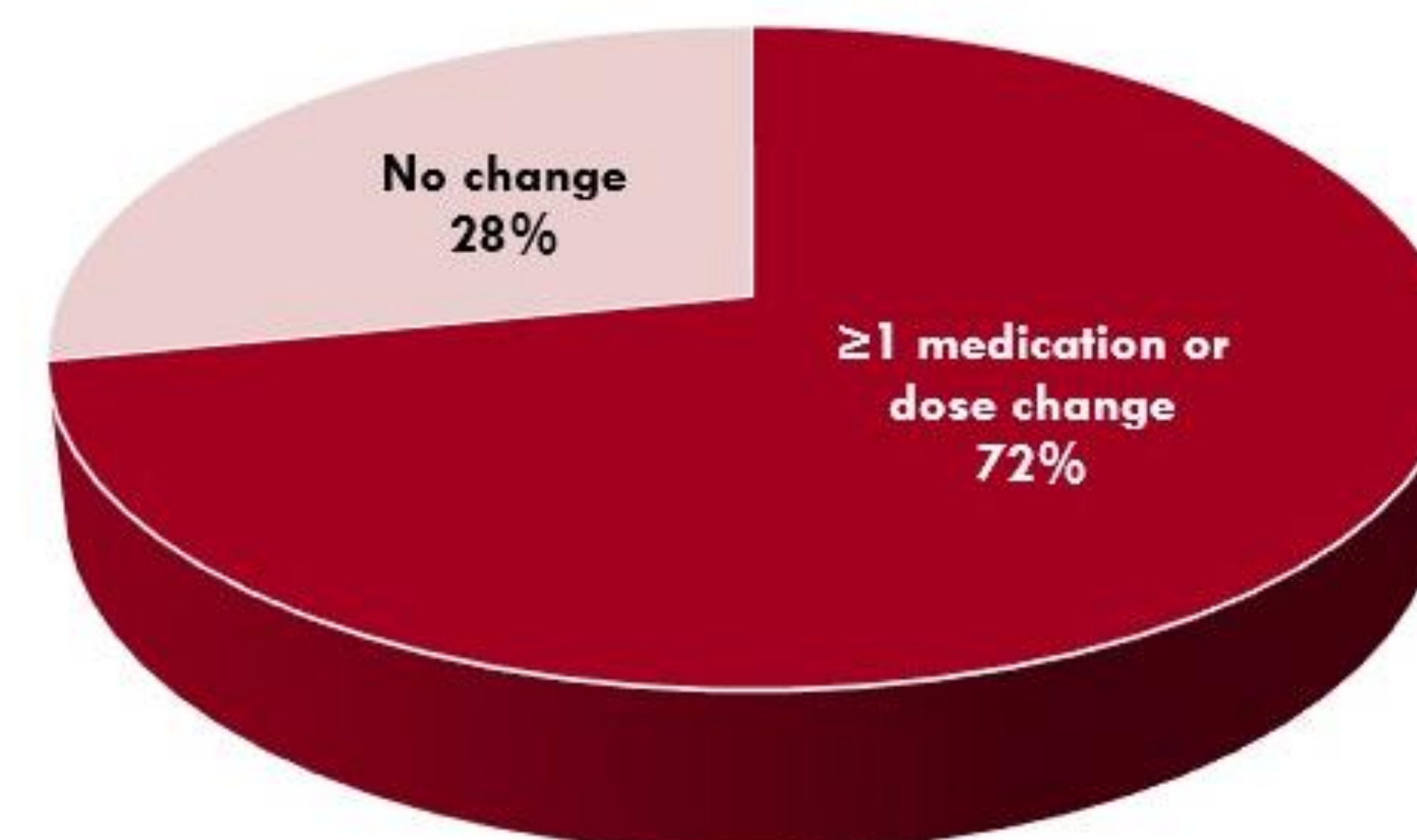


**FIGURE 2: PHARMACOGENETIC RESULTS IDENTIFYING ONE OR MORE INEFFECTIVE THERAPIES**



- Figure 2: ineffective therapies defined as increased or decreased response to a medication leading to potential adverse effects or non-response

**FIGURE 3: PHARMACOGENETIC RESULTS PROMPTING ONE OR MORE MEDICATION OR DOSE CHANGE**



**FIGURE 4: PREVALENCE OF ALTERATIONS TO ENZYME PHENOTYPES**

Enzyme	Patients with status other than normal (NM)
CYP2D6	47%
CYP2C19	56%
CYP2C9	28%

## DISCUSSION

- Pharmacists possess the necessary skills required to implement a pharmacogenomics service, including patient education and the ability to provide evidence-based medication optimization requests, but may require additional training in pharmacogenomics.
- Three enzymes were identified as being responsible for metabolizing commonly prescribed drugs, alterations were identified as providing a current or future risk of inappropriate response to drug therapy, these varying statuses were added to the patient's problem list. (Figure 4)
- Patients with unmanaged mental health disorders, elevated PHQ-9 and/or GAD-7, history of non-response to treatment, and/or history of adverse reactions to treatment may benefit from a pharmacogenomics service to optimize medication therapy.
- Moving forward, corporate leadership is considering whether this service will expand to additional patients.

## REFERENCES

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