

Data Validation and Implementation of Pharmacogenomics

Our Practice Advisories (OPAs) and Testing

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BACKGROUND:

- Pharmacogenomics (PGx) help to optimize dosing, enhance safety, and prevent serious or life-threatening adverse events.
- It is estimated that more than 98% of people may have a pharmacologically significant gene variant.¹
- The Clinical Pharmacogenetics Implementation Consortium (CPIC) guidelines assist providers in interpreting genetic test results and aid in incorporating PGx testing recommendations in the electronic health record (EHR).
- Preemptive PGx testing of six genes reduced the number of re-hospitalizations, ED visits, and composite number of re-hospitalizations plus ED visits at 60 days by 52%, 42% and 48% respectively.²
- Implementing PGx testing and recommendations in the EHR can reduce serious adverse effects from related medications, avoid ineffective therapy options, and generate cost savings across the health system.

SMARTER OBJECTIVE:

Access the value of implementing PGx alerts in the EHR using a medication use evaluation within the West Virginia University Health System (WVUHS).

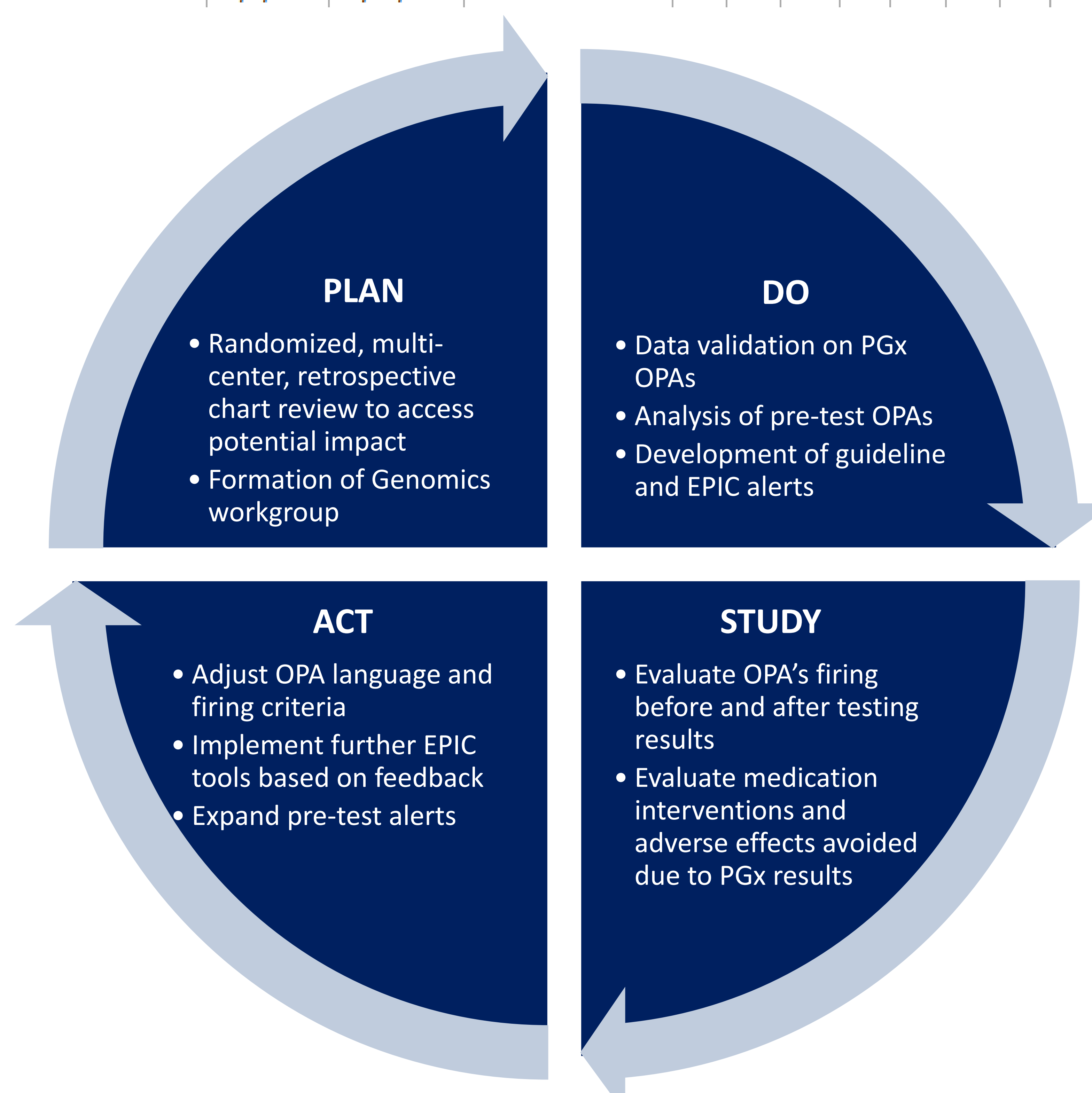
- Quantifying the incidence of potential adverse effects from medications with known gene-drug interactions
- Evaluating the potential cost savings from preventing medication-related adverse events and hospitalizations

IMPROVEMENT ACTION PLAN

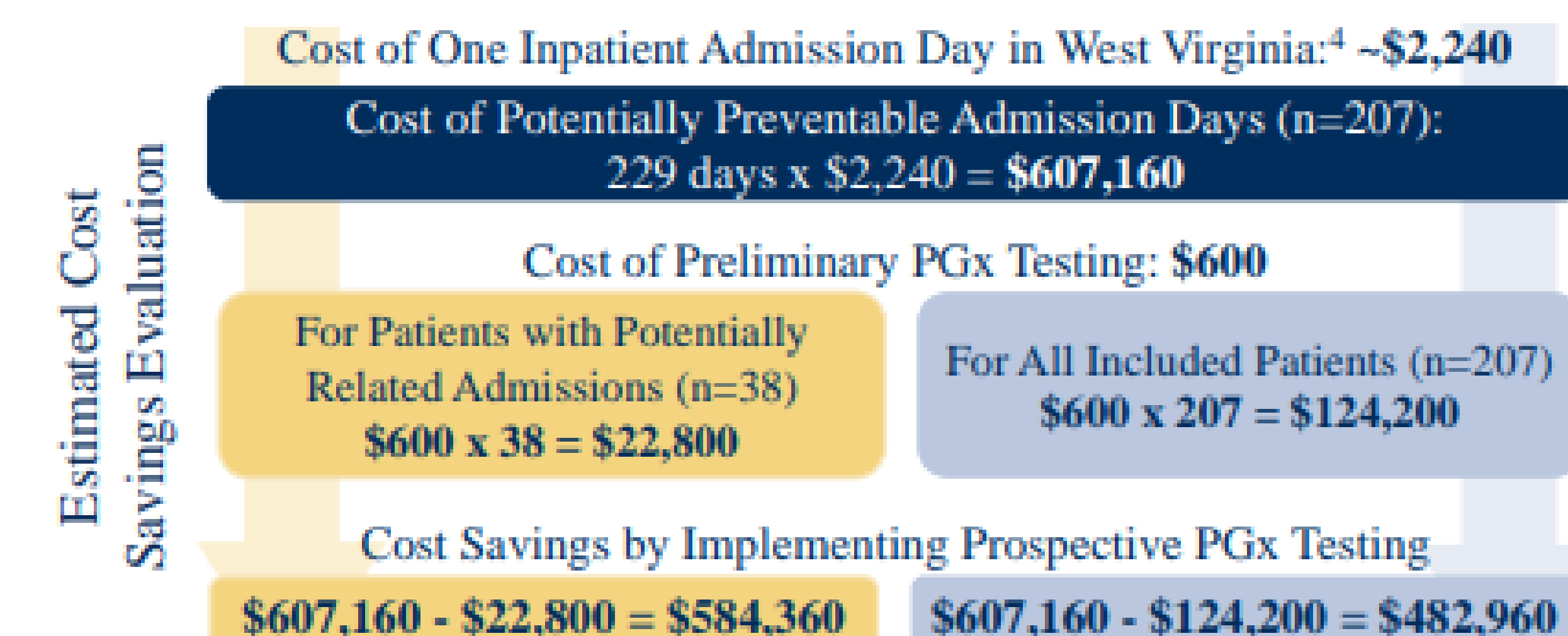
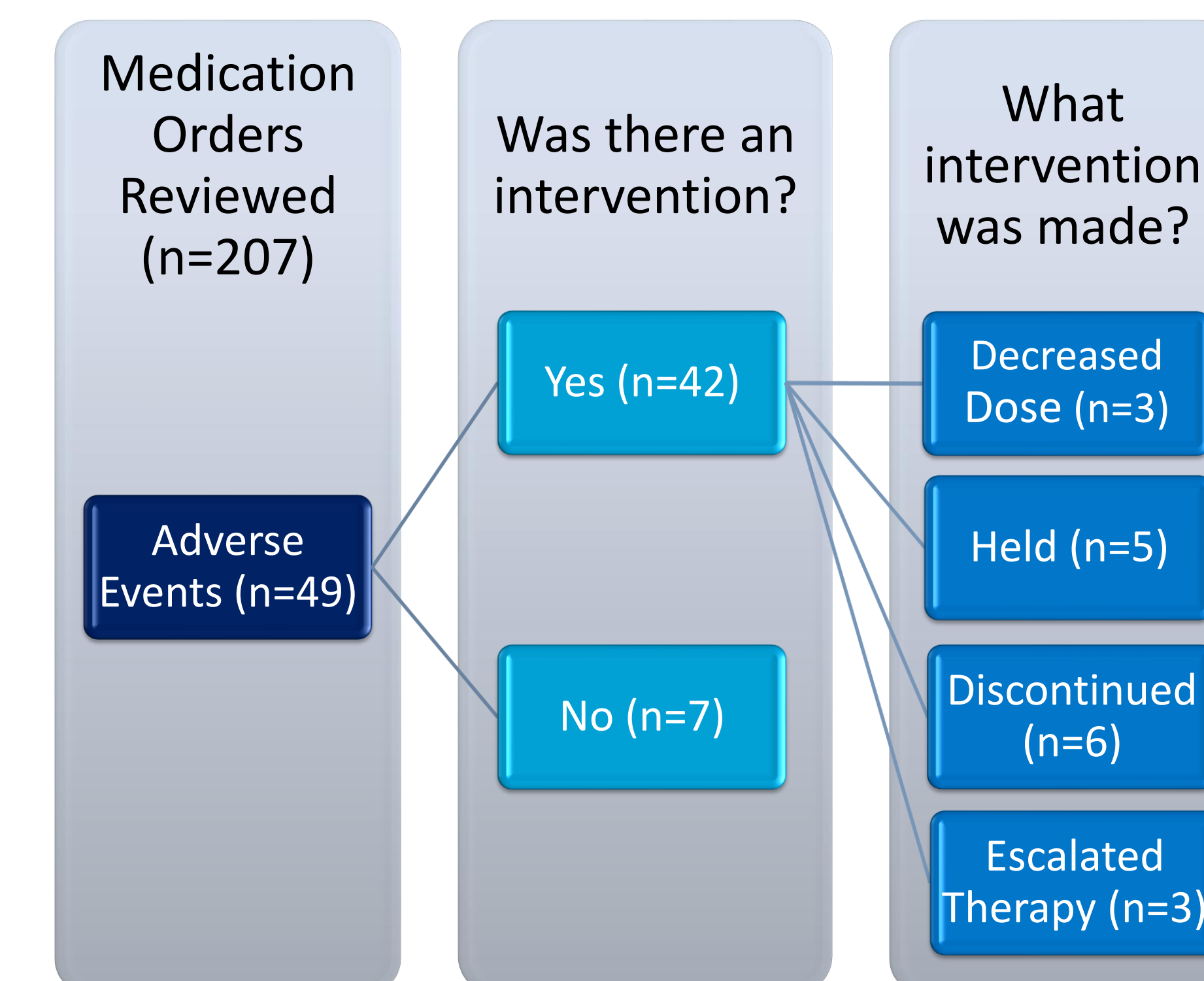
- Clinical specialists on the Enterprise Medication Use Team reviewed 38 guidelines, including 121 gene-drug interactions encompassing 21 genes.
- Maximized implementation in the EHR by determining when and how Our Practice Advisories (OPAs) will fire based on significance.
- Development of clinical practice guidelines and additional EPIC alerts related to PGx

RESULTS:

Task Name	Start Date	End Date	Percent Complete	2024						2025						
				July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Jun	
Medication Use Evaluation	7/11/2024	9/30/2024	100%	█	█	█										
Data Validation	9/1/2024	10/25/2024	100%			█	█									
Pre-Test Alerts	1/1/2025	2/6/2025	100%							█	█					
Go-Live	3/17/2025	3/17/2025	70%									█				
Post Implementation Review	6/1/2025	12/31/2025	0%													█



RESULTS: (CONT):



SCALE UP PLAN:

- Expand PGx testing to clarify the true impact of genetic differences
- PGx education and training of providers and other healthcare staff throughout the organization including all areas of care
- Additional studies including a larger number of patients to further validate and develop recommendations in the EHR

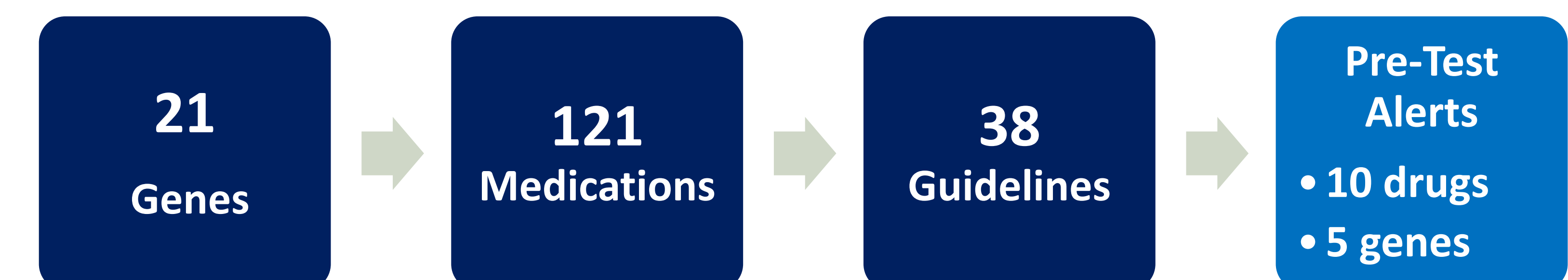
SUSTAINABILITY PLAN:

- Evaluation of number of OPA's that fire before and after testing results
- Evaluation of number of medication interventions due to PGx results
- Evaluation of adverse effects avoided due to PGx testing
- Pharmacogenomic team to continue to monitor and implement improvements

LESSONS LEARNT:

- It is essential to continue exploring the rapidly evolving field of PGx to develop and implement tools that more effectively address variations in medications metabolism among patients.

Gene	Medication	Recommendation
CFTR	Ivacaftor	Testing Required
G6PD	Pegloticase	
	Primaquine	
	Rasburicase	
HLA-B/HLA-A	Tafenoquine	Testing recommended with potential for early onset serious/fatal toxicities
	Abacavir	
DYPD	Carbamazepine	
	Capecitabine	
	Fluorouracil	



References:

- "Pharmacogenomics Fact Sheet." National Human Genome Research Institute, NIH, 2024, www.genome.gov/about-genomics/educational-resources/fact-sheets/pharmacogenomics.
- Elliott LS, Henderson JC, Neradilek MB, Moyer NA, Ashcraft KC, Thirumaran RK. Clinical impact of pharmacogenetic profiling with a clinical decision support tool in polypharmacy home health patients: a prospective pilot randomized controlled trial. PLoS One. 2017;12:e0170905. doi: 10.1371/journal.pone.0170905.