

# **Data Validation and Implementation of Pharmacogenomics Our Practice Advisories (OPAs) and Testing** Jeanette Rich, PharmD and Julie Sibbesen, PharmD Enterprise Medication Use Team; West Virginia University Health System

## **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.<sup>1</sup>
- The Clinical Pharmacogenetics Implementation Consortiur (CPIC) guidelines assist providers in interpreting genetic te results and aid in incorporating PGx testing recommendations in the electronic health record (EHR).
- Preemptive PGx testing of six genes reduced the number re-hospitalizations, ED visits, and composite number of rehospitalizations plus ED visits at 60 days by 52%, 42% and 48% respectively.<sup>2</sup>
- 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 usin 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
- $\succ$  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 wh and how Our Practice Advisories (OPAs) will fire based on significance.
- Development of clinical practice guidelines and additional EPIC alerts related to PGx



### **References:**

1."Pharmacogenomics Fact Sheet." National Human Genome Research Institute, NIH, 2024, www.genome.gov/about-genomics/educational-resources/fact-sheets/pharmacogenomics. 2.Elliott LS, Henderson JC, Neradilek MB, Moyer NA, Ashcraft KC, Thirumaran RK. Clinical impact of pharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool in polypharmacogenetic profiling with a clinical decision support tool with a clinical decision support tool with a clinical decision support with a clinical decision support tool with a clinical decision support with a clinical decision support tool with a clinical decision support with a clinical decision 10.1371/journal.pone.0170905.

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Data validation	9/1/2024	10/25/202	JZ4 100%												
Pre-Test Alerts	1/1/2025	2/6/202	25 100%												
GO-LIVE Post Implementation Review	3/1//2025 v 6/1/2025	3/1//202	025 70%				_								
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	PLAN				D	0									
<ul> <li>Randomized, multi- center, retrospective chart review to access potential impact</li> </ul>				<ul> <li>Data validation on PGx</li> </ul>											
				OPAs Anolucio e functo de ODA											
				<ul> <li>Analysis of pre-test OPAs</li> <li>Dovolonment of guideline</li> </ul>											
<ul> <li>Formation of Gend</li> </ul>			mics	and EPIC alerts											
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•	<ul> <li>Adjust OPA language and</li> </ul>				<ul> <li>Evaluate OPA's firing</li> </ul>										
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				adverse effects avoided due to PGx results											
	Gono			ation		Pacammandation									
	CETR		Integlication			Recommendation									
	CLIW		Pegloticase												
Pre-Test			Primaquine			Testing Required									
Alerts	G6PD		Rasburicase												
• 10 drugs			Tafenoquine												
• 5 genes	HI A-R/H	ΙΔ-Δ	Abacavir												
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			Capecitabine			les	stin	g re	com	mer	nde	a wi	th po	oter	

Fluorouracil

lesting recommended with potential for early onset serious/fatal toxicities

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- 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
- 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
- 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.



## **WVU**Medicine

## **RESULTS: (CONT):**



Cost of One Inpatient Admission Day in West Virginia:<sup>4</sup> ~\$2,240 Cost of Potentially Preventable Admission Days (n=207): 229 days x \$2,240 = \$607,160

Cost of Preliminary PGx Testing: \$600

For Patients with Potentially Related Admissions (n=38) \$600 x 38 = \$22,800

For All Included Patients (n=207) \$600 x 207 = \$124,200

Cost Savings by Implementing Prospective PGx Testing 607,160 - 22,800 = 584,360607,160 - 124,200 = 482,960

## **SCALE UP PLAN:**

## **SUSTAINABILITY PLAN:**

## **LESSONS LEARNT:**