



## The What- *Pharmacogenomics*

Clinical **pharmacogenomics (PGx)** is the application of genetics to predict risk of **pharmacokinetic changes, adverse reactions, and medication response** on an individual patient level. Clinical pharmacogenetics is being implemented in clinical practice through single gene tests, exome/genome sequencing and more commonly as genetic panels and is rapidly expanding outside of pioneering academic medical centers to become standard of practice.<sup>1</sup> Despite PGx evidence being strongest for use in specialties such as oncology, behavioral health, cardiology, organ transplant and pain, health systems are opting for system wide implementation as medications with PGx implications are pervasive across specialties and patient populations.<sup>1</sup>

## The Why

It is estimated that **99% of patients have an actionable variant** and **more than half** of primary care prescriptions **have at least one actionable PGx variant.**<sup>2-4</sup>

FDA has incorporated PGx based information on **over 350 medication labels** as well as publishing a Table of Pharmacogenetic Associations in 2020 to help support therapeutic management recommendations based on PGx results.<sup>5-7</sup>

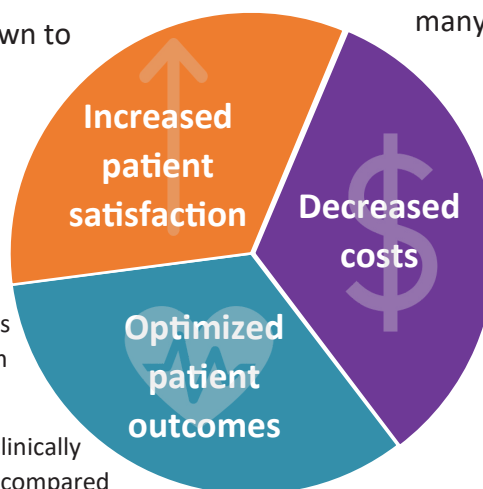
The **Clinical PGx Implementation Consortium (CPIC)** is the national source for guideline driven PGx recommendations that currently **has 26 guidelines representing 23 genes and over 65 drugs.**<sup>5,7</sup>

## The Impact

Using PGx guided medication therapy management has been shown to **increase patient satisfaction** as well as **medication adherence.**<sup>9</sup>

PGx-guided therapy has been shown to **optimize clinical outcomes** in behavioral health, oncology, and pain.<sup>1,12-15</sup>

- With PGx-guided care, patients were 70% more likely to achieve remission from depression
- PGx-guided dosing of fluoropyrimidines reduced the risk of severe toxicity from 77% to 18%
- 24% of PGx-guided patients reported clinically meaningful reduction in pain intensity compared to 0% with usual care



PGx guided dosing has been shown to be **cost effective** by **avoiding expensive adverse drug reactions** and **preventing rehospitalizations** in many disease states.<sup>10-12</sup>

- PGx guided care in home health patients decreased 60-day readmission by 52% and ED visits by 42% with a cost savings estimated at \$4382 per patient
- PGx-guided antiplatelet therapy showed cost avoidance of cardiovascular events was \$42,198 at one year
- PGx-guided therapy for behavioral health showed 40% decrease in ED visits and a cost reduction of \$1948



## The Top Barriers

### Information technology

EHR interfaces, clinical decision support tools and integration of PGx results are some the **most cited implementation barriers** as most health systems don't currently use the infrastructure needed for this type of health information.<sup>16</sup>

### PGx testing

PGx assay selection, timing, gene analysis, clinical utility and drug-gene pair selection are frequently listed as barriers to implementation often **requiring expert guidance.**<sup>16,17</sup>

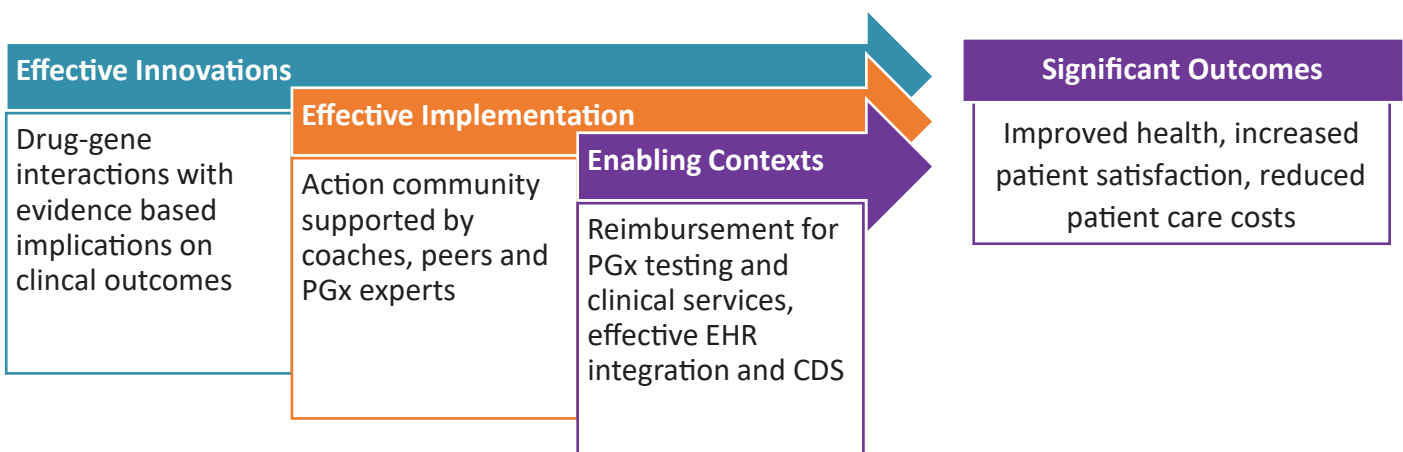
### Education

Understanding of PGx spans overall awareness to expert knowledge and are all **necessary for PGx implementation.** Education is a necessary complement of implementation for patients, health care staff and providers.<sup>16</sup>

## The Solution- *PGx Accelerator*

The Pharmacogenomics Accelerator is a 12-month collaborative experience with an **all-teach, all-learn approach** targeting the most common implementation barriers, supported by implementation science framework, and **facilitated by PGx experts and implementation coaches.** The vision of the Pharmacogenomics Accelerator is to improve the health of millions across the U.S. **by personalizing medication therapies** based on an individual's pharmacogenomic profile by **catalyzing implementation** into health care.<sup>14</sup> The PGx Accelerator aims to increase implementation efficiency through **organized, targeted health system implementation**, and by providing **access to PGx experts** and the PGx community, overall accountability and **PGx specific implementation tools.**

By using a plan built on implementation science, we are **catalyzing health care change through PGx implementation.** Well-implemented evidence-informed interventions yield **significantly better outcomes** than those that have been poorly implemented and prepares the intervention for replication, **sustainability and scale up** as PGx interventions within health care will only continue to expand.





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