

Pharmacogenomics in Action: Insights from UCSF's Clinical Implementation Program

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Abstract

Adverse drug reactions remain a leading cause of morbidity and mortality in the United States. Preemptive pharmacogenomic (PGx) testing has demonstrated efficacy in mitigating such events, including evidence from randomized controlled trials, and interest in widespread adoption continues to grow. Despite this, implementation of PGx in clinical practice remains limited.

In 2023, the University of California, San Francisco (UCSF) launched a preemptive PGx program that integrates testing into the electronic health record.(1) The program issues a pharmacogenomic testing prompt (PTP) whenever any of 15 targeted medications are prescribed and stores results for future application across 56 PGx-relevant drugs.

This presentation will: (1) describe the structure and scope of UCSF Health's clinical PGx program, including genes and medications covered; (2) summarize ordering trends and utilization patterns across the health system; (3) evaluate equity in PGx test ordering by examining patient access across clinical services; and (4) present preliminary clinical data on PGx-guided prescribing for azathioprine and proton pump inhibitors.

Collectively, these findings provide early insights into the adoption, equity, and clinical impact of a large-scale, preemptive PGx implementation at a major academic medical center.

References

1.Tamraz B, Shin J, Khanna R, Van Ziffle J, Knowles S, Stregowski S, Wan E, Kamath R, Collins C, Phunsur C, Tsai B, Kong P, Calanoc C, Pollard A, Sawhney R, Pleiman J, Devine WP, Croci R, Sashikanth A, Kroon L, Cucina R, Rajkovic A. Clinical implementation of preemptive pharmacogenomics testing for personalized medicine at an academic medical center. *J Am Med Inform Assoc.* 2025;32(3):566-71. Epub 2024/12/12. doi: 10.1093/jamia/ocae293. PubMed PMID: 39665424; PMCID: PMC11833476.