

# Empowering Patients: Establishment of a Pharmacist-Led Pharmacogenomics Clinic at St. Jude Children's Research Hospital

Allison W. Bragg, Pharm.D.<sup>1</sup>; Kayla M. Thibodaux, Pharm.D., MBA<sup>1</sup>; Alberto S. Pappo, M.D.<sup>2</sup>; Kristine R. Crews, Pharm.D.<sup>1</sup>; Cyrine E. Haidar, Pharm.D.<sup>1</sup>  
<sup>1</sup>Department of Pharmacy and Pharmaceutical Sciences; <sup>2</sup>Department of Oncology, St. Jude Children's Research Hospital, Memphis, TN

## BACKGROUND

- Pharmacogenomic test results have life-long implications for medication therapy.
- Since 2011, over 7500 patients have undergone preemptive pharmacogenomic testing after consenting for enrollment on the **PG4KDS** clinical trial ([www.stjude.org/pg4kds](http://www.stjude.org/pg4kds)).
- In a survey conducted among **PG4KDS** participants and families in 2020, 75% of respondents reported that they did not share their St. Jude pharmacogenomics results with non-St. Jude providers. Additionally, 89% reported that they did not share their results with non-St. Jude pharmacists.
- In person return of pharmacogenomic results may increase patient understanding of their results, facilitate sharing of test results with other healthcare providers, and promote gene-based prescribing by outside providers.
- In November 2023, a pharmacist-led pharmacogenomics clinic was established at St. Jude Children's Research Hospital (St. Jude) to offer individualized gene-based medication counseling and educational resources to patients and families.

## PROCESS

- Patients at St. Jude undergo preemptive pharmacogenomic testing via single-gene tests or panel testing through the **PG4KDS** clinical trial.
- Results for up to 16 genes are returned and placed in the electronic health record (EHR).
- A pharmacogenomics clinic appointment is scheduled when high-risk pharmacogenomic results are received, at the request of patients, or at the request of clinicians.
- A pharmacogenomics pharmacist creates personalized education summaries explaining the basic principles of pharmacogenomics, the patient's genotype and corresponding phenotype results, as well as provide recommendations for pharmacotherapy (Figure 3).
- Pharmacogenomic test results and the personalized education summaries are posted in the EHR, and viewable in the electronic patient portal (Figure 4).

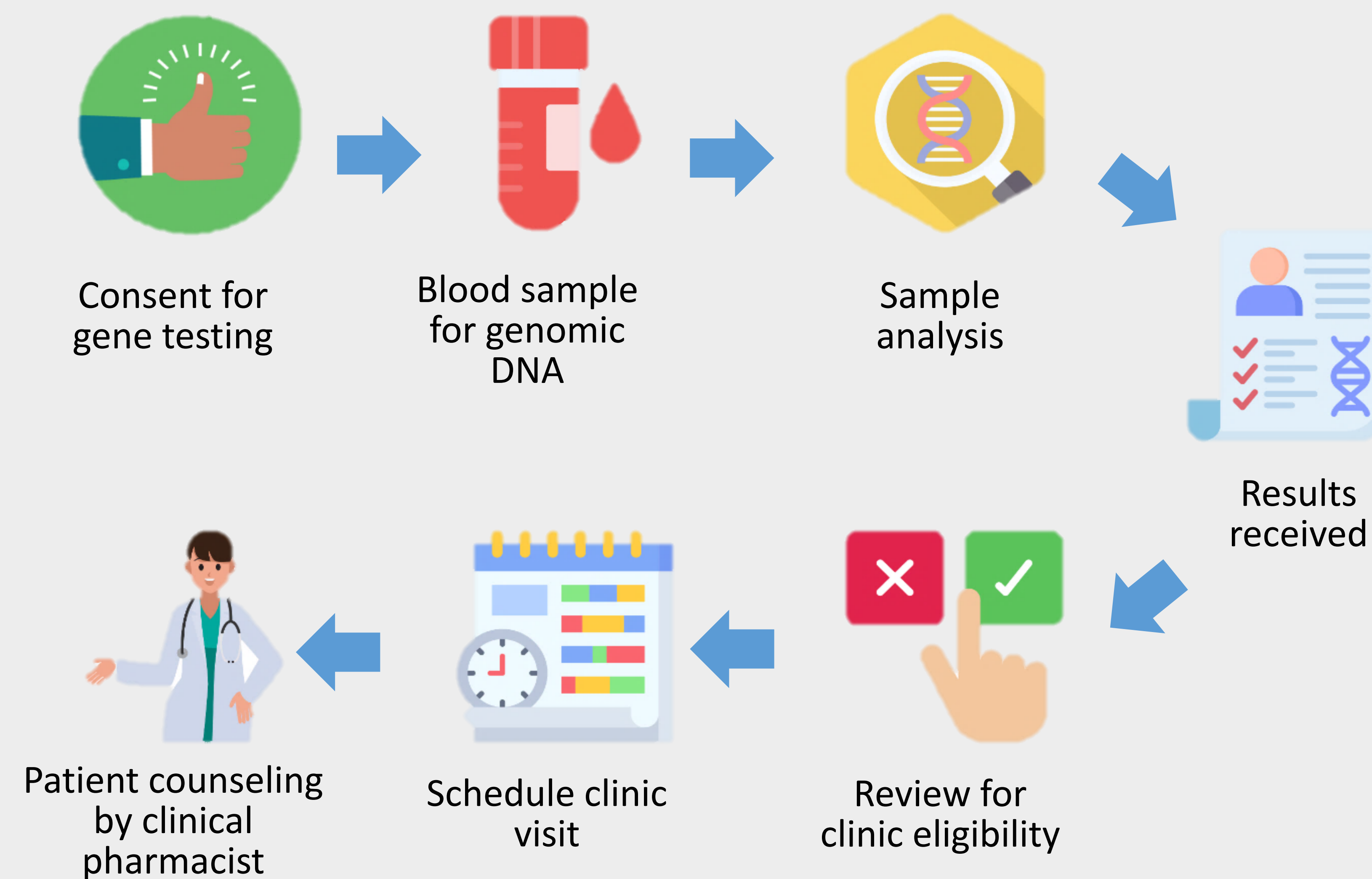


Figure 1: Process for Returning Results in the Pharmacogenomics Clinic at St. Jude

## RESULTS

Age, years (median, range)	7.6 (0.4-22.9)	Pharmacist Time Per Clinic Encounter, minutes (median, range)	25 (10-50)
<b>Gender (Patient Reported)</b>		<b>Number of High-Risk Phenotypes per patient (median, range)</b>	3 (1-8)
Male	52 (58%)		
Female	37 (42%)		
<b>Visit Location</b>		<b>Type of Testing</b>	
Inpatient	6 (7%)	Single Gene	10 (11%)
Outpatient Clinic	83 (93%)	Panel	79 (89%)
<b>Primary Service</b>		<b>Patients Receiving Actionable Medications at Time of Counseling (Recommended Therapy Modification)</b>	
Hematology	2 (2%)	Amitriptyline (monitor for efficacy)	1
Infectious Diseases	1 (1%)	Irinotecan (monitor for neutropenia/diarrhea)	1
Leukemia/Lymphoma	29 (33%)	Mercaptopurine (30% dose reduction)	5
Neuro Oncology	25 (28%)	Voriconazole (monitor serum concentrations)	1
Radiation Oncology	4 (4%)		
Solid Tumor	23 (26%)		
Transplant and Cellular Therapy	5 (6%)		
<b>Race</b>		<b>Reason for Visit Initiation</b>	
Asian/Asian Indian	4 (5%)	Patient/Family Request	5 (6%)
Black or African American	23 (26%)	Prescriber Request	3 (3%)
Pacific Islander	1 (1%)	Scheduled by Pharmacogenomics Team	81 (91%)
White	60 (67%)		
Other	1 (1%)		

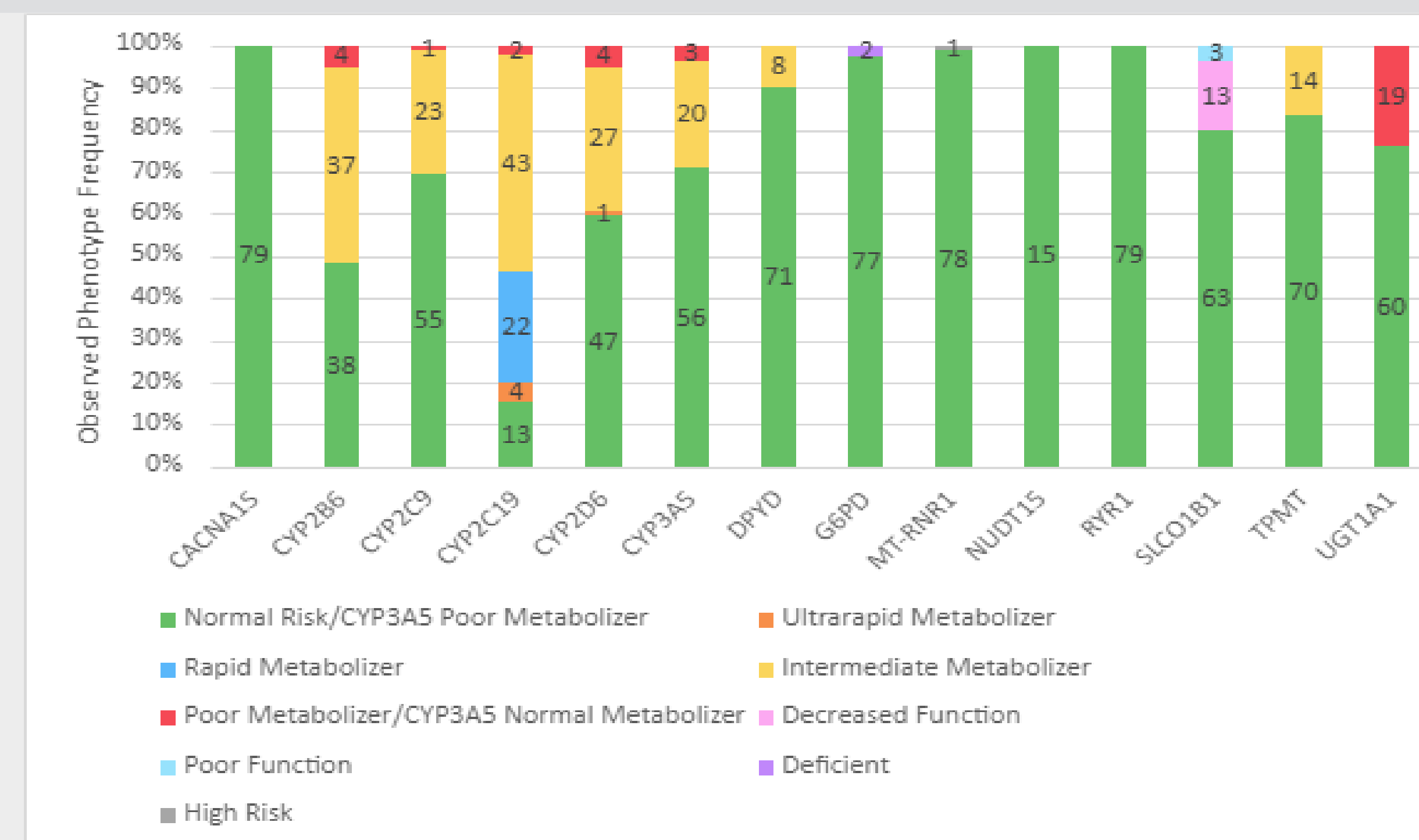


Figure 2: Frequency of High-Risk Pharmacogenomic Phenotypes by Individual Gene Returned in the 89 Patients Seen in the Pharmacogenomics Clinic

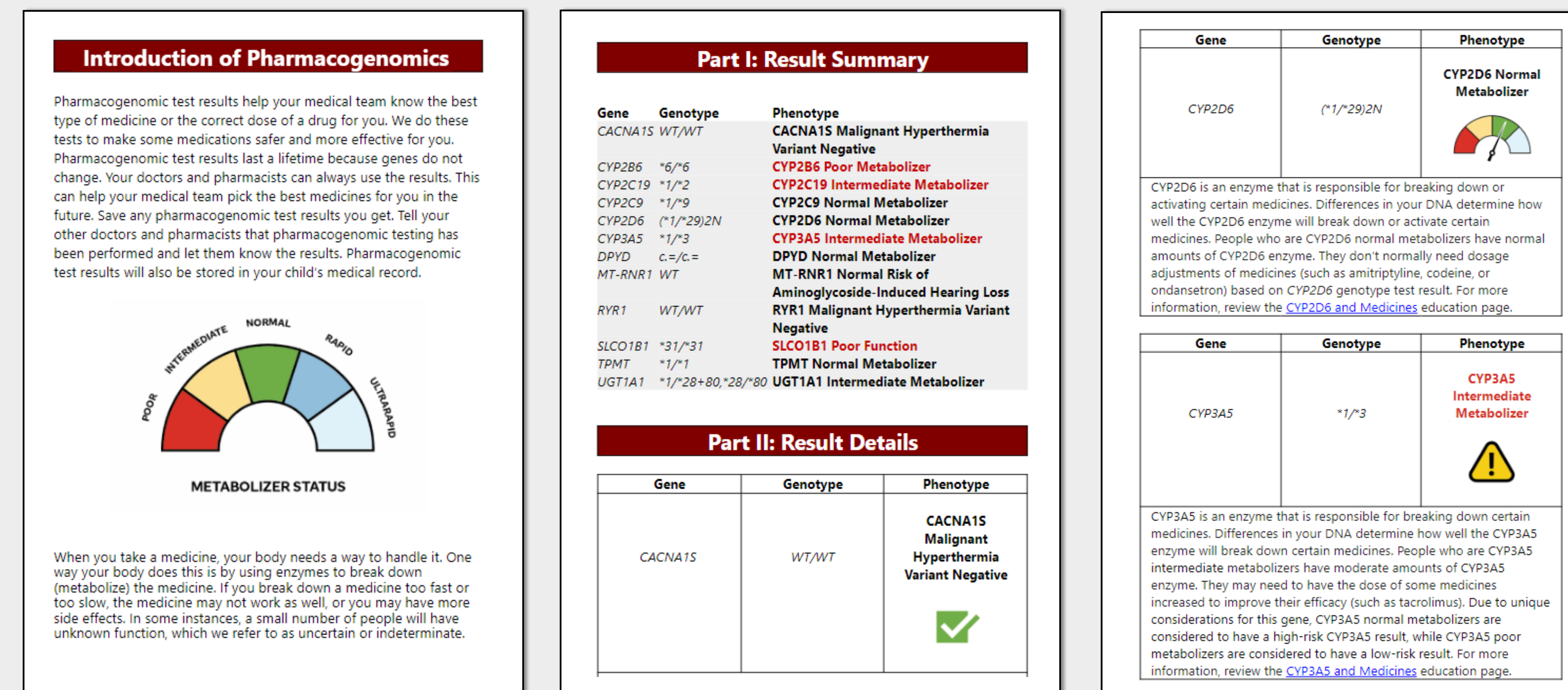


Figure 3: Sample Pharmacogenomic Patient Education Summary

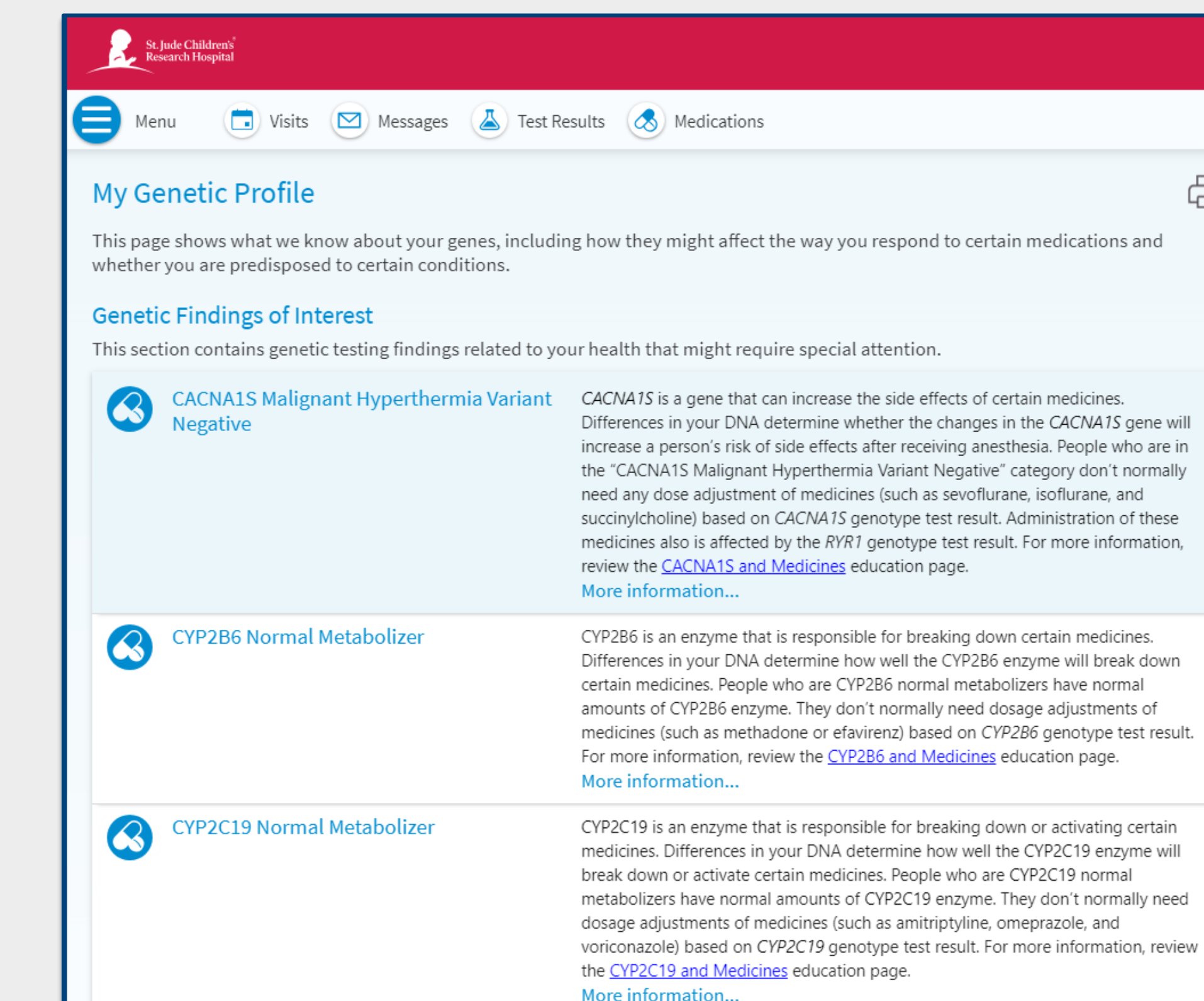


Figure 4: "My Genetics" Section Viewable in the Electronic Patient Portal

## CONCLUSIONS

- We have demonstrated the feasibility of returning pharmacogenomics test results within a pharmacist-led pharmacogenomics clinic.
- Patient education is an important component for the integration of pharmacogenomics into clinical practice.
- Eight of the patients seen in clinic were receiving a high-risk medication indicating the need for close monitoring or dose modification.
- This return of results model for pharmacogenomics incorporates a variety of patient education modalities such as personalized education summaries, the electronic patient portal, and face-to-face teaching to promote understanding.

## REFERENCES

- Hoffecker G, Cayabyab M, Varughese LA, Asher SB, Bajaj A, Tuteja S. Establishing a patient-centered, multidisciplinary pharmacogenomics clinic in an academic health system: Successes, challenges, and future direction. *J Am Coll Clin Pharm.* 2024; 7(3): 234-243. doi:10.1002/jac5.1868
- Haidar CE, Crews KR, Hoffman JM, Relling MV, Caudle KE. Advancing Pharmacogenomics from Single-Gene to Preemptive Testing. *Annu Rev Genomics Hum Genet.* 2022;23:449-473. doi:10.1146/annurev-genom-111621-102737

## FUNDING/GRANT SUPPORT

Supported, in part, by the National Institutes of Health Cancer Center Support (CORE) grant P30 CA021765 and the American Lebanese Syrian Associated Charities (ALSAC).

## MORE INFORMATION

