Strategies for *DPYD* Testing Prior to Fluoropyrimidine Chemotherapy in the United States

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INTRODUCTION

- Patients with dihydropyrimidine dehydrogenase (DPD) deficiency are at high risk for severe and fatal toxicity from fluoropyrimidine (FP) chemotherapy[1]
- Pre-treatment *DPYD*/DPD testing is standard of care in many countries but not the United States (US)[2]
- <u>Objective:</u> Assess current pre-treatment *DPYD* testing implementation approaches in the US

METHODS

- Respondents
  - US sites that have implemented pre-treatment *DPYD* testing or plan to implement soon
- Survey
  - 22-item online survey distributed via relevant organizations (MASCC, PGRN, CPIC) and social networks from August through October 2023
  - Asked about the site's *DPYD* testing program, including test ordering, interpreting and reporting
- Data Analysis
  - Data from 24 unique sites were analyzed using descriptive analysis

RESULTS

- 67% of sites tested only selected patients who were prescribed FP chemotherapy (Figure 1)
  - Selection criteria included type of cancer and clinician preference
- Only ~50% of sites had a systematic test ordering process (Figure 2)
  - Others require clinician to remember
- 54% of sites used commercial testing laboratories (Table 1)
  - OneOme used most frequently (29%)
- 67% of sites used a multi-gene panel (Figure 3)
  - 86% tested ≥4 actionable *DPYD* variants

SUMMARY

- Implementation approaches vary, and many sites lack robust, institution-wide systems to maximize testing effectiveness
- These findings underline the need for best practices to guide *DPYD* testing implementation

Fig 1: Patient Selection for Testing

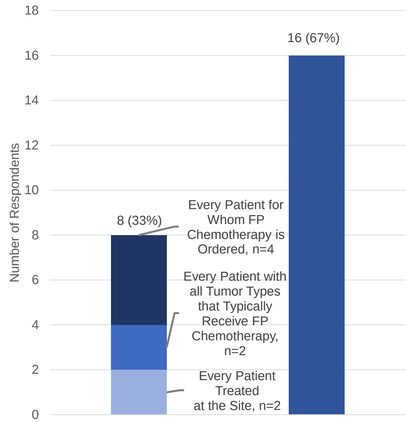


Fig 2: How Testing is Initiated

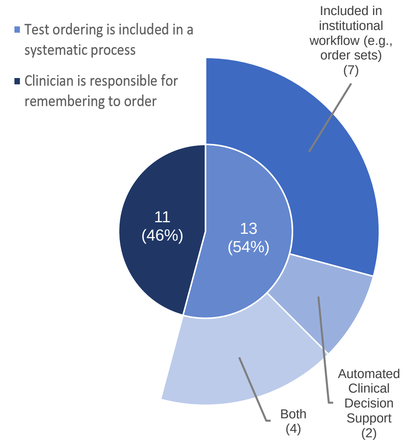
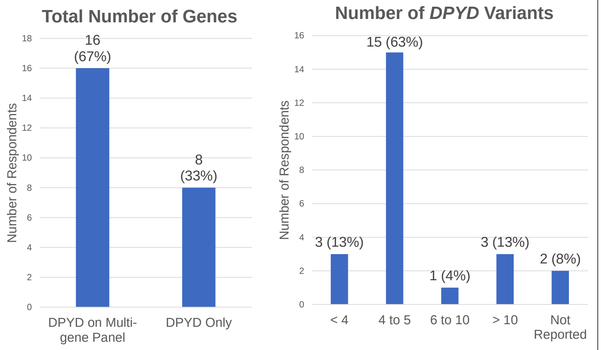


Table 1: Most Frequently Used Commercial Testing Laboratories

Genetic Testing Laboratory	Mean TAT (range) [days] [a]	Number of *DPYD* Variants Tested	Total Number of Genes Tested	Sites Using this Lab [n (%)]
OneOme	8 (5-12)	5	27	7 (29%)
Mayo Labs	7 (5-10)	9	1	3 (13%)
LabCorp	9 (7-10)	5	1	2 (8%)

[a]: Time spans were included in the average by using the median days in the span (e.g., 7-10 days=8.5 days); TAT=turnaround time

Fig 3: *DPYD* Testing Panels [a]



[a]: n=24; If sites used multiple laboratories, only the laboratory testing for the highest number of genes was included in this analysis

WORK CITED

[1] Deac AL et al. A systematic review on the importance of genotyping and phenotyping in fluoropyrimidine treatment. *Medicine and Pharmacy Reports*. 2020;93(3):223-230.

[2] Varughese LA et al. DPYD and UGT1A1 Pharmacogenetic Testing in Patients with Gastrointestinal Malignancies: An Overview of the Evidence and Considerations for Clinical Implementation. *Pharmacotherapy*. 2020;40(11):1108-1129.