Utilization and Findings of a Rapid Turnaround Laboratory Process for Hereditary Breast Cancer

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Background

- Breast cancer surgical decisions may be directly impacted by germline genetic testing results.
- Time from diagnosis to surgery is typically within 3-4 weeks.
- Average turnaround-time (TAT) for BRCA1/2 and/or breast cancer panels is 10-21 days.
- To expedite the delivery of results, we developed an accelerated “STAT” panel. Here we examine findings and utilization of this panel of breast cancer risk genes.

Methods

Using an IRB-approved protocol, we analyzed 4406 consecutive orders from de-identified patients tested with a two- to nine-gene (BRCA1, BRCA2, CDH1, PALB2, PTEN, STK11, TP53, ATM, CHEK2) STAT panel at a commercial laboratory between July 2016 and March 2017 (Figure 1). Genes selected for inclusion on this panel were based on overall breast cancer risk and impact on imminent surgical and/or therapeutic management.

The STAT workflow includes:
- parallel lab processes
- preemptive variant confirmation
- tightly scheduled interpretation, reporting, and signout shifts

The rate of pathogenic (P) and likely pathogenic (LP) findings, ordering indications, and requisition practices were analyzed.

Results

Indications for testing included personal history of breast cancer (87.5%), ovarian cancer (1.4%), pancreatic cancer (0.5%), or prostate, colorectal, gastric cancers, and melanoma (all < 0.5%) (Figure 2). Family history of breast and/or ovarian cancer alone was reported in 7.1%. Of the 4406 STAT orders, 337 (7.6%) were P/LP, most commonly in BRCA1/2 (5.0%), CHEK2 (1.8%), ATM (1.2%), and PALB2 (1.0%) (Figure 3). Approximately half of the orders (53.6%) were re-requisitioned, and an additional 121 (5.1%) patients had P/LP findings (Figure 4). The average turnaround time for the initial order was 7 days, compared with 15 for non-STAT.

Conclusions

- Implementation of a novel STAT laboratory workflow produces results in 5-12 days (7 days on average).
- Over half of STAT orders were re-requisitioned for additional genes, suggesting STAT panels with flexible options are key for ordering providers.
- It is advantageous to receive specific P/LP results that can change urgent management decisions without eliminating the option of re-requisitioning to a larger panel.

References