Groundbreaking study supports germline genetic testing for all cancer patients

INVITAE

In a study published in *JAMA Oncology*, Mayo Clinic and Invitae researchers provided genetic testing and counseling to patients as part of their standard cancer care.

The INTERCEPT study

- The largest known multicenter study of universal testing of patients with cancer
- Published in *JAMA Oncology*
- Includes 2,984 patients with a new or active cancer diagnosis, across a broad mix of solid tumor cancer stages and types

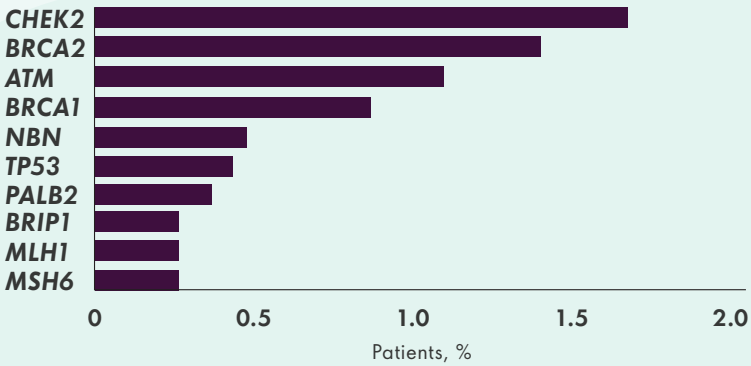
The study found:

1 in 8 **patients with cancer had an inherited cancer-related genetic variant**

28% of patients with the highest risk cancer genes had **changes to medical management**, including chemotherapy and surgical decisions

48% of **patients with inherited variants** were missed by existing testing guidelines

Most common pathogenic and likely pathogenic variants in high and moderate risk genes:



Don't miss actionable findings. Invitae makes it easy to test all of your cancer patients.

- Institutional contracts and patient self-pay options
- Test all blood relatives of patients with positive results
- Genetic counselors available on-demand to answer any questions

Simplify. Identify.

Study supports germline genetic testing for all cancer patients

Study takeaways

- All patients with a cancer diagnosis should be offered genetic testing
- Standard guidelines miss nearly half of patients with inherited variants
- Genetic testing can change medical management and treatment decisions

Overview

Identification of a germline predisposition in patients with cancer can have important implications for treatment decisions, risk-reducing interventions, cancer screening, and cascade testing of family members. Patient selection for genetic testing is traditionally based on certain clinical or family history factors stipulated in clinical practice guidelines. This large study, conducted by the Mayo Clinic (at its Cancer Center sites) and Invitae, sought to determine prevalence and potential clinical impact of pathogenic germline variants (PGVs) in cancer patients using a universal testing approach compared to targeted testing based on clinical guidelines and the uptake of cascade family testing.

Study design

Prospective multi-center study of germline genetic alterations among solid tumor cancer patients receiving care at Mayo Clinic cancer centers (Rochester, MN; Jacksonville, FL; Phoenix, AZ) and a community practice (Eau Claire, WI) between April 1, 2018 and March 31, 2020. Patients were not selected based on cancer type, disease stage, family history of cancer, ethnicity, or age. Germline sequencing was done via Invitae's >80 gene next-generation sequencing panel.

Relevant findings

Of 2,984 patients included in the study, PGVs were found in 1 in 8 (13.3%), 48% of which would not have been detected using standard guidelines. Of the 397 total PGVs, 282 were in moderate and high penetrance cancer susceptibility genes. Variants of uncertain significance (VUS) were found in 47% of patients. Only a younger age of diagnosis (<50 years old) was associated with the presence of PGV.

192 patients (6.4%) had clinically actionable findings that would not have been detected by clinical or family history-based testing criteria. 28% of patients with a high penetrance PGVs had modifications in their treatment or management based on the finding, including surgery, targeted therapy or enrollment in a clinical trial. Despite the availability of no-cost cascade testing, only 70 patients (18%) with PGVs had family members access this option.

Cancer type	P/LP rate	Cancer type	P/LP rate
Breast	12%	Prostate	13%
CNS/brain	12%	Renal	13%
Colorectal	15%	Bladder	14%
Pancreas	15%	Ovarian	20%
Biliary	14%	Endometrial	13%
Esophageal/gastric	14%	Head/neck	10%
Hepatocellular	16%	Lung	14%
Small bowel	25%	Sarcoma	8%

HEADQUARTERS | 1400 16th Street, San Francisco, CA 94103 | ONLINE | www.invitae.com | CONTACT | www.invitae.com/contact