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Importance of clinically actionable results in genetic panel testing for cancer

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While advances in technology have made multigene testing, or "panel testing," for genetic mutations that increase the risk of breast or other cancers an option, authors of a review published today in the *New England Journal of Medicine* say larger studies are needed in order to provide reliable risk estimates for counseling these patients. The international consortium of authors, including researchers at the Basser Center for BRCA at the University of Pennsylvania's Abramson Cancer Center, acknowledges that panel testing can make a useful contribution to predicting a woman's risk of breast cancer, but says clinicians need to be aware of the limitations. The note of caution comes following news of low-cost genetic testing solutions for breast and ovarian cancer mutations.

Panel testing can cover more than 100 genes, 21 of which are cited as increasing a patient's risk of breast cancer. However, recent studies suggest that because there is a lack of information about many genetic variants, multiplex testing may cause undue anxiety and stress over findings which may turn out to be benign. In addition, some researchers are concerned that positive results for genetic mutations may lead patients to take significant and potentially unnecessary risk-reducing or screening interventions based on very limited information.

The review considers evidence for specific genes where there is some reported association with an increased risk of breast cancer. For many - such as RAD51C, RAD51D, and BRIP1 which show clear evidence of association with ovarian cancer - the association with breast cancer is

limited. In most instances, the evidence does not reach the level of evidence threshold proposed by the authors.

"While there is clear evidence between some genetic variants and an increased risk of breast cancer - such as BRCA1 and BRCA2, for which there is an overwhelming body of evidence - risk estimates for many other mutations are far too imprecise at this stage and require further investigation," said co-author Susan M. Domchek, MD, director of the Basser Center for BRCA, and the Basser Professor of Oncology in Penn's Abramson Cancer Center and Perelman School of Medicine. "Until we have a better understanding of associated risks of the range of genes found on these panels, individuals who are undergoing panel testing need to be informed of the potential for uncertainty regarding results."

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