

New study provides BRCA mutation carriers guidance for when surgery has greatest impact

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Of the women who carry the mutated BRCA1/2 genes, 45-65 percent will develop breast cancer, and 15-39 percent will develop ovarian cancer in their lifetimes. Many women, especially those who have experienced the death of family members to these cancers, elect to undergo preventive surgeries that can significantly increase life expectancy, but require extensive recovery time and can impact later fertility and quality-of-life. However, few guidelines exist that shed light on the optimal age to undergo these procedures, and in what sequence. A new study in the INFORMS journal *Decision Analysis* provides insight to help enable physicians and patients make better-informed choices.

The study, "Was Angelina Jolie Right? Optimizing Cancer Prevention Strategies Among BRCA Mutation Carriers," was conducted by Eike Nohdurft and Stefan Spinler of the Otto Beisheim School of Management, and Elisa Long, of the UCLA Anderson School of Management.

"Following Angelina Jolie's revelation in 2013 that she carries a BRCA1 mutation and candid discussion of her own decision to undergo a preventive BM and BSO two years later, studies have reported an "Angelina Jolie effect" with referrals for genetic testing increasing twofold and rates of preventative bilateral mastectomies also more than doubling," said Eike Nohdurft.

The procedures that BRCA mutation carriers can choose to undergo include a bilateral mastectomy (BM), which involves surgically removing both breasts and reduces the lifetime risk of breast [cancer](#) by 95 percent. An additional procedure, a bilateral salpingo-oophorectomy (BSO), the removal of both ovaries and fallopian tubes, reduces risk of [ovarian cancer](#) by 80 percent and reduces breast cancer risk by an additional 60 percent. While the impact on [life expectancy](#) is significant, these invasive procedures are associated with a number of possible complications, including hormonal side effects and fertility implications.

The researchers developed a decision-analytic model that provides a timetable for women who carry these gene [mutations](#) regarding which procedures to undergo, in what order they should be conducted, and at what age they will have the greatest positive impact. According to the study results, for female carriers of a BRCA1 gene mutation, a BM is recommended between the ages of 30 and 60, followed by a BSO after the age of 40. For BRCA2 carriers, the optimal age for a BM is between 40 and 46 years and after age 49 for a BSO.

The study was motivated by one of the author's, Elisa Long, own battle with [breast cancer](#) and subsequent discovery that she carries a BRCA1 genetic mutation. After completing treatment in 2015 and discussing whether to undergo additional preventive surgery with her doctors, she observed that no comprehensive decision-support tool existed to help patients make these difficult decisions. She partnered with Stefan Spinler and Eike Nohdurft, a visiting doctoral student, to build an evidence-based model and help fill this gap.

"This new insight will allow women to make a more informed decision for their long-term approach to cancer prevention and other mitigating factors such as family planning," said Nohdurft.

More information: Eike Nohdurft et al. Was Angelina Jolie Right?

Optimizing Cancer Prevention Strategies Among BRCA Mutation Carriers, *Decision Analysis* (2017). [DOI: 10.1287/deca.2017.0352](https://doi.org/10.1287/deca.2017.0352)

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