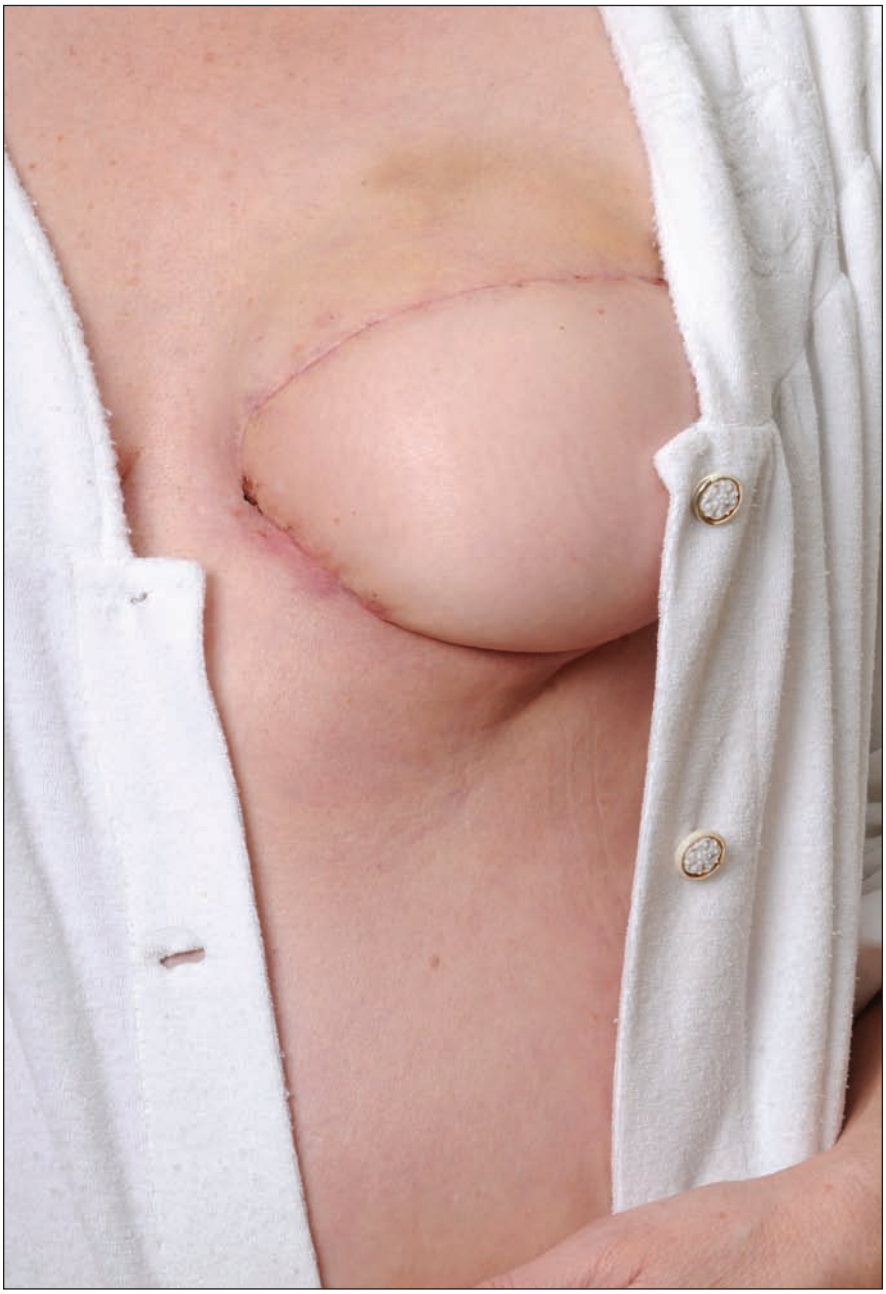
Young women with breast cancer genes face tough choices

Lindsay Avner never met her grandmother or her great-grandmother. Before she was born, breast cancer claimed them both, the latter at age 58, the former on the cusp of turning 40. The disease also struck her mother, as did ovarian cancer, though she survived both. In 2005, a genetic test revealed that Avner, like three generations of her family before her, would likely develop breast cancer during her lifetime, so she made a difficult decision. Though only 23 years old, she underwent a bilateral prophylactic mastectomy.

"At that point, I was one of the youngest people in the country to make that decision," says Avner, founder and executive director of Bright Pink, a Chicago, Illinois–based nonprofit organization that provides education and support to young women at high risk of developing breast and ovarian cancer (brightpink.org).

As genetic testing increases in accessibility and popularity, more young women are facing the same decision, after discovering they carry a mutation in one or both of the so-called breast cancer genes: *BRCA1* (BReast CAncer gene one) or *BRCA2* (BReast CAncer gene two). The mutations are associated with increased risk of breast and ovarian cancer, leaving the young women affected with three choices: increased surveillance, chemoprevention or prophylactic surgery. Unfortunately, the most radical choice — removing healthy breasts — is the one that offers the most protection from cancer.

"People who have a mutation have a high risk of developing cancer. We know that. Also, we know that the most effective way to reduce risk is to go for prophylactic surgery," says Maria Katapodi, an assistant professor at the University of Michigan School of Nursing in Ann Arbor.



Prophylactic surgery is viewed by many experts as being the most effective way to reduce risks associated with breast cancer.

In the general population, the cumulative lifetime risk of breast cancer in women is 12% and the risk of ovarian cancer is 2%. But for a woman with a *BRCA1* mutation, those risks can exceed 80% and 40%, respectively. Mutation carriers can reduce their risk of developing breast cancer by 90% or more through bilateral prophylactic mastectomy (*J Natl Cancer Inst* 2001; 93:1633-7). Though awareness of genetic testing has increased substantially in recent years — accompanied by a large increase, in the United States at least, in the number of "previvors" who opt for prophylactic mastectomies (*J Clin Oncol* 2007;25:5203-9) —

many women remain unaware of their high-risk status.

In her research, Katapodi has found that many women at high risk of breast cancer underestimate that risk and fail to receive adequate screening (*Oncol Nurs Forum* 2009;36:306-14). Poor communication between relatives from a family with a genetic heritage of breast cancer also contributes to poor uptake of genetic testing (*Oncol Nurs Forum* 2011;38:572-81).

"I would say we still do not screen enough people. Once you find a mutation carrier, you need to go to first-, second- and third-degree relatives," says Katapodi. "We only see 50% of the people we need to see. We miss about half of the high-risk people."

But even women considered high-risk should not be made to feel that they have no choice but to undergo *BRCA* testing, says Dr. Ellen Warner, a medical oncologist at Sunnybrook Health Sciences Centre in Toronto, Ontario. "The first rule is that they must want to be tested," says Warner, adding that some young women are pressured into taking the test by their families. "I know a 16-year-old who got tested."

For those who do seek testing and discover they have a mutation, several factors influence their decision whether to undergo preventive surgery. A family history of breast and ovarian cancer is, by far, the most influential factor (*Clin Genet* 2008;73:474-9). Women who have no personal experience with cancer, on the other hand, tend to struggle in deciding which option to pursue (www.nursinglibrary.org/vhl/handle/10755/159752). Cultural attitudes regarding prophylactic surgery also come into play, as evidenced by the greater popularity of preventative mastectomies in North American than in Europe (*J Clin Oncol* 2008;26:1093-7).

Women who carry the mutation may also sometimes be persuaded into choosing surgery over other options by medical professionals whose primary concern is avoiding legal troubles. "If you don't tell a patient to have her breasts removed and they get cancer, you might get sued. The most litigation-averse way to avoid the problem is to recommend surgery," Warner says.

Instead of guiding patients in a manner designed to avoid litigation, physicians should refer women who are potentially at high risk to genetic clinics to receive personalized risk assessments and information on the benefits, risks and limitations of genetic testing, Warner and colleagues stated in a recent *CMAJ* practice article (www.cmaj.ca/lookup/doi/10.1503/cmaj.111670). "People who are not at high risk, either because they do not meet the criteria for testing or because their tests were negative for a known family mutation, can be reassured," the paper states. "People who have a *BRCA* mutation, or who are at high risk based on family history but have an uninformative test result, will receive management recommendations."

Pressure to undergo surgery can also come from peers, Warner adds, citing an example of a woman who decided against mastectomy until joining a support group whose members had all undergone the procedure. "The support group basically guilted her into having her breasts taken off."

The reasons often cited for foregoing surgery include a desire to breast-feed children and hopes that cancer will remain at bay long enough for a better solution to present itself. Some women have also expressed concern about the effects of mastectomy on their appearance and sex lives, though recent improvements in breast reconstructive surgery have allayed some of those fears. Other women, while grateful for warning of their elevated risk for cancer, mourn the loss of the blissful ignorance they enjoyed before learning of their *BRCA* mutations.

In 2005, television writer Jessica Queller, whose mother had died from ovarian cancer, discovered she carried the *BRCA1* mutation. In an essay, the then-35-year-old expressed thanks for knowledge that could save her life, despite feeling "weighed down by the burdensome information" of her genetic legacy (www.nytimes.com/2005/03/05/opinion/05queller.html). "It's akin to Eve taking a bite of the apple," wrote Queller, who eventually chose to undergo a double mastectomy. "Once you have the knowledge, there's no turning back."

Of course, no one enjoys living under the dark cloud of disease, waiting for cancer to invade their bodies — hoping it will take decades, fearing it will strike tomorrow. Taking a genetic test for breast cancer risk takes a certain measure of courage, says Avner. The alternative, however, is hardly attractive. "Knowing your risk is better than knowing you have cancer," says Avner. "I look at this information as a blessing, not a burden. This information was not available to my grandmother or my great-grandmother." — Roger Collier, *CMAJ*

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Editor's note: Eighth of a multipart series on genetic testing.

Part 1: **Separating hype from reality in the era of the affordable genome** (www.cmaj.ca/lookup/doi/10.1503/cmaj.109-4143).

Part 2: **Popping the genetics bubble** (www.cmaj.ca/lookup/doi/10.1503/cmaj.109-4142).

Part 3: **Who should hold the keys to your DNA?** (www.cmaj.ca/lookup/doi/10.1503/cmaj.109-4141).

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Part 5: **Race and genetics in the doctor's office** (www.cmaj.ca/lookup/doi/10.1503/cmaj.109-4134).

Part 6: **Predisposed to risk but not change** (www.cmaj.ca/lookup/doi/10.1503/cmaj.109-4157).

Part 7: **Unhealthy behaviours influenced by genes and environment** (www.cmaj.ca/lookup/doi/10.1503/cmaj.109-4162).