Dear Alice,

My father's mother had breast cancer and died around the age of 45 - 50. Can I possibly get it through my father, or can you only contract it through heredity if it's passed on through females?

Answer

Dear Reader,

Family history, including specific genetic mutations and family lifestyle, is important in figuring out a person's risk for breast cancer. The good news is that lifestyles can be changed, and inheriting an altered or mutated gene that has been linked to breast cancer does not necessarily mean that breast cancer will develop. In fact, the American Cancer Society states that only "5% to 10% of breast cancer cases are hereditary as a result of gene changes (mutations)."

Certain mutated genes can be passed through the mother or the father. This is seen most commonly in the BRCA1 and BRCA2 (Breast Cancer 1 and 2) genes, which are found on chromosome #17 and #13, respectively. BRCA1 and BRCA2 are tumor suppressor genes. Because these genes are found on these particular chromosomes (and not sex chromosomes), a son or daughter can receive altered BRCA1 or BRCA2 genes from either the mother or the father (men can get breast cancer, too, but the risk of developing it is much lower).

Every person, regardless of whether or not s/he has or will have breast cancer, has two copies of the BRCA1 gene (one on each chromosome #17) and two copies of the BRCA2 gene (one on each chromosome #13). Mutations in one or both copies of either gene can increase the risk of developing certain types of cancer, including breast and ovarian cancer.

If a mother has a gene mutation that may increase her risk of developing breast cancer on a chromosome that is not a sex chromosome, then there is approximately a 50/50 chance that she will pass that gene mutation onto her son or daughter. If the son or daughter received a copy of the mutated gene, there is again about a 50/50 chance that s/he will pass it on to his/her son or daughter. If the son or daughter did not receive a copy of the mutated gene, it is unlikely that he or she will pass on a defective copy of the gene on to the next generation, unless that gene somehow becomes mutated.

If you have other questions or would like more information, you can check out the American Cancer Society.
[4] the National Cancer Institute [5], and Breastcancer.org [6].

Alice!
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