About *NBN* Gene Mutations

About Genes

Genes are in every cell in our bodies. Genes are made of DNA, which gives instructions to cells about how to grow and work together. We have two copies of each gene in each cell—one from our mother and one from our father. When genes work properly, they help keep cancer cells from developing. If one copy of a gene has a mutation, the gene cannot work correctly. This raises the risk for certain cancers.

The *NBN* gene has two main jobs. The first is to help fix DNA when it is damaged. The second is to help prevent cancer from forming.

If you have a mutation in one copy of the *NBN* gene, it cannot perform its jobs as it normally would. A person who inherits one mutation in *NBN* is at an increased risk for certain types of cancer.

NBN mutations are more common in people of Slavic ancestry, where about 1 in 150 individuals have a mutation in *NBN* that is thought to increase their risk for certain cancers.

NBN Mutations and Cancer Risks

BREAST CANCER

About 10 in 100 women will get breast cancer in their lifetime. Among women with mutations in *NBN*, about 20-30 in 100 may get breast cancer in their lifetime.

PROSTATE CANCER

About 15 in 100 men will get prostate cancer in their lifetime. Among men with mutations in *NBN*, this number is believed to be higher, but the exact risk is unknown at this time.

OTHER CANCERS

People with *NBN* mutations may have a small, increased risk for other cancers. Better data is still needed to understand these risks.

Recommendations

WOMEN

Women should practice breast awareness, which involves being familiar with their breasts and reporting any changes to their healthcare provider.

Starting at age 35: Clinical breast exams by a doctor yearly

Starting at age 40: Annual mammograms with consideration of breast MRI with contrast. Depending on family history, this may start earlier in life.

Women may also consider additional risk-reduction strategies, such as risk-reducing medications. These options should be discussed with a high risk cancer specialist.

MEN

Prostate cancer screening can be considered. This would include a digital rectal examination and prostate specific antigen (PSA). Options should be discussed with a doctor.

CHILDREN AND SIBLINGS

Siblings and children of people with a *NBN* mutation have a 1 in 2 chance of also having the mutation. Genetic counseling and testing are recommended for them after age 18.

If two people with *NBN* mutations have a child together, there is a 1 in 4 chance the child will have a condition called Nijmegen Breakage Syndrome (NBS). Signs of NBS include short stature, small head size, recurrent respiratory problems, immune deficiency, intellectual disability, and cancer risks. If only one parent has a mutation in *NBN*, their children are not at risk for NBS.

FAMILY MEMBERS WHO TEST NEGATIVE

Family members without the *NBN* mutation probably most likely do not have a higher risk of getting cancer. The family history of cancer and other risk factors may raise their risk somewhat. Family members who test negative for the *NBN* mutation should talk with their doctor or genetic counselor about the right cancer screenings.

It is important to know which side of the family carries the *NBN* mutation. This allows those relatives to know about their cancer risk. A genetic counselor can help you know who in your family should be tested.

Do you have questions about your risk for cancer? Our doctors and genetic counselors can help find the cancer screening plan you need. Call Huntsman Cancer Institute's Family Cancer Assessment Clinic to learn more: 801-587-9555. Huntsmancancer.org/fcac