UT Southwestern Harold C. Simmons Comprehensive Cancer Center | NCI Designated Comprehensive Cancer Center

CHEK2 Mutations

What You Should Know About *CHEK2* Mutations

Individuals with a mutation in the *CHEK2* gene have an increased risk for cancers of the breast, colon, prostate, and possibly thyroid and kidney. Our knowledge of *CHEK2* and the related cancer risk primarily comes from data on one specific mutation seen predominantly in individuals with Northern European ancestry (this mutation is called c.1100del). Mutations in other locations of the *CHEK2* gene may cause slightly different risks for cancer than those listed below.

Cancer Risks Associated with a *CHEK2* Mutation

- Breast Cancer: The estimated breast cancer risk for women with a *CHEK2* mutation is 23-48%. This risk varies depending on an individual's family history. Women with a *CHEK2* mutation who have already had breast cancer have up to a 29% risk to develop a second primary breast cancer. Men with *CHEK2* mutations have an increased risk to develop breast cancer with an estimated risk of 0.4-1.0%.
- Colorectal Cancer: Both men and women with a *CHEK2* mutation are thought to have an increased risk for colorectal cancer (compared to the general population risk of ~4%), but the specific lifetime risk is not known at this time.
- Prostate Cancer: The risk for prostate cancer in men with a *CHEK2* mutation is up to 27%. Similar to female breast cancer risk, this risk varies depending on an individual's family history of prostate cancer.
- Other Cancers: Kidney and thyroid cancers have also been observed more frequently in individuals with a *CHEK2* mutation, but true lifetime risks are unknown.

Risks to Family Members

Mutations in the *CHEK2* gene are inherited in an autosomal dominant fashion. This means that children, brothers, sisters, and parents of individuals with a *CHEK2* mutation have a 1 in 2 (or 50%) chance of having the mutation as well. Individuals with a *CHEK2* mutation may develop cancers of the breast, colon, prostate, thyroid, kidney, or none of the above. Both males and females can inherit a familial *CHEK2* mutation and both males and females can pass it on to their children.

Managing Cancer Risks

The following surveillance is recommended by the National Comprehensive Cancer Network (NCCN V1.2020).

Breast Cancer

- For women, an annual mammogram beginning at age 40 (or 5-10 years before the youngest breast cancer diagnosis in the family, but no later than age 40) is recommended. Women may also consider including an annual breast MRI with contrast. This decision should be made with their health care provider.
- Currently, there are no consensus management guidelines for male breast cancer. Men with a *CHEK2* mutation are encouraged to discuss family history of cancer and breast cancer surveillance options (i.e., clinical breast exam) with a physician to determine an appropriate surveillance regimen.
- There is insufficient evidence to support risk-reducing mastectomy based on having *CHEK2* mutation alone. Management of breast cancer risk should be based on personal risk factors for cancer as well as family history of cancer.

Colorectal Cancer

- Colonoscopy screening every 5 years (or more frequently based on findings) beginning at age 40, or 10 years prior to the earliest age of colorectal cancer diagnosis in a first-degree relative (i.e., parent, child, sibling), whichever comes first.

Prostate Cancer

- Discuss family history of cancer and prostate cancer surveillance options (i.e., PSA, digital rectal exam) with a physician to determine an appropriate surveillance regimen.

Other Cancers

- Currently, there are no management guidelines for other cancer risks. Individuals with a *CHEK2* mutation are encouraged to discuss these cancer risks, along with family history and personal risk factors, to establish an appropriate surveillance regimen.

Last updated 01/09/2020