UT Southwestern
Harold C. Simmons
Comprehensive Cancer Center

NCI
Designated
Comprehensive
Cancer Center

ATM Mutations

What You Should Know About *ATM* Mutations

Individuals with an *ATM* mutation have an increased lifetime risk for breast, pancreatic, prostate, and possibly other cancers. Exact lifetime cancer risks for individuals with one mutation in this gene are not fully understood, but more specific information becomes available with ongoing research. Individuals who inherit only one mutation in the *ATM* gene are said to have *ATM*-associated cancer risks.

When an individual inherits two *ATM* mutations (one from each parent), this causes a syndrome called Ataxia Telangiectasia (AT). This is a recessive genetic condition that affects the nervous system, immune system, and other body systems.

Cancer Risks Associated with an *ATM* Mutation

Females with one *ATM* mutation have up to a 38% lifetime risk of breast cancer. Having more relatives with breast cancer may further increase these risks.

Males who have one *ATM* mutation may be at an increased risk for prostate cancer compared to the ~11% risk in the general population. The lifetime breast cancer risk for males with an *ATM* mutation is not thought to exceed 1%.

Males and females with one *ATM* mutation may also be at an increased risk for pancreatic cancer compared to the general population risk of ~1.6%. The exact lifetime pancreatic cancer risk for *ATM* mutation carriers has not yet been established. The risk for other types of cancer may also be increased, but exact risks are unknown.

Risks to Family Members

Mutations in the *ATM* gene are inherited in an autosomal dominant fashion. This means that children, brothers, sisters, and parents of individuals with an *ATM* mutation have a 1 in 2 (50%) chance of having the mutation as well. Individuals with an *ATM* mutation may develop cancer, or they may not at all. Both males and females can inherit a familial *ATM* mutation and can pass that it on to their children.

Rarely, individuals inherit two ATM mutations (one from each parent) and have Ataxia Telangiectasia (AT).

- AT significantly effects childhood development, particularly motor control, and greatly increases the risk for multiple types of cancer.
- ATM genetic testing for the partner of an individual with an ATM mutation may be appropriate to clarify the risk of having a child with AT.
- When both individuals in a couple have an *ATM* mutation, their offspring each have a 25% (1 in 4) chance to inherit AT.

Managing Cancer Risks

Management guidelines are limited, and recommendations may be individualized based on personal and family history. Recommendations may include:

Breast Cancer

- Annual mammography (with consideration of tomosynthesis) and breast MRI beginning at age 40
- There currently is insufficient evidence to recommend a risk-reducing mastectomy; however, individuals can discuss this option with their doctors in light of their family history.

Prostate Cancer

- No consensus management guidelines
- Consider beginning prostate cancer screening 5-10 years earlier than the youngest age at diagnosis of prostate cancer in the family.

Pancreatic Cancer

- No specific screening guidelines for pancreatic cancer. Pancreatic cancer screening may be considered for carriers of an *ATM* mutation with a family history of pancreatic cancer.
- Consider imaging techniques including endoscopic ultrasonography (EUS) and/or magnetic resonance cholangiopancreatography (MRCP).

Other Cancer Risks

- There may be other cancer risks associated with *ATM* mutations for which we do not yet have sufficient evidence to warrant intervention, including melanoma, leukemia, lymphoma and cancers of the ovary, mouth, throat, thyroid, and uterus. Further research is needed to make conclusions about these cancer risks.

Last updated 01/09/2020