STK11 gene

Associated Syndrome Name: Peutz-Jeghers Syndrome (PJS)

STK11 Summary Cancer Risk Table

CANCER	GENETIC CANCER RISK
Breast	High Risk
Colorectal	High Risk
Endometrial	High Risk
Gastric	High Risk
Lung	High Risk
Other	High Risk
Ovarian	High Risk
Pancreatic	High Risk

STK11 gene Overview

Peutz-Jeghers Syndrome (PJS) [1, 2, 3, 4, 5]

- Individuals with mutations in the *STK11* gene have a condition called Peutz-Jeghers Syndrome (PJS).
- Women with PJS have a risk for breast cancer that is significantly increased over the 12.5% lifetime risk for women in the general population of the United States. Individuals with PJS have high risks for a variety of other cancers, including colorectal, endometrial, gastric, pancreatic, small bowel, cervical and lung cancers. These cancers are often diagnosed at relatively young ages.
- The cervical cancer associated with PJS, adenoma malignum, which is also known as minimal deviation adenocarcinoma (MDA), may be difficult to diagnose.
- Women with PJS have an increased risk for ovarian neoplasms, including adenocarcinomas. However, sex cord tumors are the most common ovarian tumor found in these patients.
- Males with PJS have an increased risk for testicular tumors, particularly large cell calcifying Sertoli cell tumors (LCCSCT). These tumors have a low risk for malignancy, but if left untreated may lead to feminizing changes, advanced skeletal age and short stature.
- Patients with PJS are likely to develop hamartomatous gastrointestinal polyps with a distinctive Peutz-Jeghers histology. The most common location of these polyps is the small bowel, but they may also be found in the stomach, colon and nasal passages. Polyps may require treatment due to bleeding with subsequent anemia, recurrent obstruction and/or intussusception.
- Patients with PJS are likely to develop pigmented spots around the mouth, eyes, nostrils, anus and on the fingers during childhood. These spots are usually present by age 5 and often fade during puberty and adulthood.
- Although there are high risks for cancer and other medical problems in patients with PJS syndrome, these risks can be reduced with appropriate medical management. Guidelines from the National Comprehensive Cancer Network (NCCN) are listed below, and additional detailed discussions of medical management options are also available from other sources (see van Lier MG et al., Am J Gastroenterol. 2010, 105:1258-64 and Beggs AD et al. Gut. 2010, 59:975-86). Due to the complexity of the condition it is recommended that patients with *STK11* mutations and a diagnosis of PJS be managed by a multidisciplinary team with experience in the prevention and treatment of the complications associated with this condition.

STK11 gene Cancer Risk Table

CANCER TYPE	AGE RANGE	CANCER RISK	RISK FOR GENERAL POPULATION
Colorectal	To age 70[1, 4, 6]	39%	1.8%
Pancreatic	To age 70[1, 4, 6]	11%-36%	0.6%
Female Breast	To age 70[1, 4, 6]	32%-54%	7.4%

CANCER TYPE	AGE RANGE	CANCER RISK	RISK FOR GENERAL POPULATION
Gastric	To age 70[1, 4, 6]	29%	0.3%
Small Bowel	To age 70[1, 4, 6]	13%	0.1%
Ovarian	To age 70[1, 6]	18%-21%	0.6%
Endometrial	To age 70[1, 4, 6]	9%	1.9%
Cervical	To age 70[1, 4, 6]	10%	0.5%
Testicular	To age 70[4, 6]	Elevated risk	0.4%
Lung	To age 70[1, 4, 6]	7%-17%	2.1%

STK11 Cancer Risk Management Table

The overview of medical management options provided is a summary of professional society guidelines. The most recent version of each guideline should be consulted for more detailed and up-to-date information before developing a treatment plan for a particular patient.

This overview is provided for informational purposes only and does not constitute a recommendation. While the medical society guidelines summarized herein provide important and useful information, medical management decisions for any particular patient should be made in consultation between that patient and his or her healthcare provider and may differ from society guidelines based on a complete understanding of the patient's personal medical history, surgeries and other treatments.

CANCER TYPE	PROCEDURE	AGE TO BEGIN	FREQUENCY (UNLESS OTHERWISE INDICATED BY FINDINGS)
Colorectal	Colonoscopy[1, 7]	Baseline at age 8 to 10 years, or earlier if symptomatic, with follow-up as needed	Every 2 to 3 years after age 18
Pancreatic	Magnetic resonance cholangiopancreatography (MRCP) with contrast or endoscopic ultrasound (EUS).[1, 10]	30 to 35 years, or individualized to a younger age based on earliest age of diagnosis in the family.	Annually
Female Breast	Breast awareness - Women should be familiar with their breasts and promptly report changes to their healthcare provider. Periodic, consistent breast self-examination (BSE) may facilitate breast awareness.[11]	18 years	NA
	Clinical breast examination[1]	30 years	Every 6 months
	Mammography and breast MRI with contrast[1, 8]	30 years	Annually
Gastric	Upper endoscopy[1, 7, 9]	Baseline at age 8 to 10 years, or earlier if symptomatic, with follow-up as needed	Every 2 to 3 years after age 18
Small Bowel	Small bowel visualization with CT, MRI enterography or video capsule endoscopy[1, 7]	Baseline at 8 to 10 years, or earlier if symptomatic, with follow-up as needed, but no later than age 18	Every 2 to 3 years after age 18
Ovarian	Physical exam, monitor for precocious puberty[7]	Age 8	Annually
	Pelvic examination and pap smear[1]	18 to 20 years	Annually
Endometrial	Pelvic examination and pap smear[1]	18 to 20 years	Annually
Cervical	Pelvic examination and pap smear[1]	18 to 20 years	Annually

CANCER TYPE	PROCEDURE	AGE TO BEGIN	FREQUENCY (UNLESS OTHERWISE INDICATED BY FINDINGS)
Testicular	Physical and testicular examination and observation for feminizing changes.[1, 7]	Age 10	Annually
Lung	Provide education about symptoms and smoking cessation.[1]	As needed	As needed

Information for Family Members

The following information for Family Members will appear as part of the MMT for a patient found to have a mutation in the *STK11* gene.

This patient's relatives are at risk for carrying the same mutation(s) and associated cancer risks as this patient. Cancer risks for females and males who have this/these mutation(s) are provided below.

Family members should talk to a healthcare provider about genetic testing. Close relatives such as parents, children, brothers and sisters have the highest chance of having the same mutation(s) as this patient. Other more distant relatives such as cousins, aunts, uncles, and grandparents also have a chance of carrying the same mutation(s). Testing of at-risk relatives can identify those family members with the same mutation(s) who may benefit from surveillance and early intervention.

Since *STK11* mutations carry a risk for complications in children and some screenings are recommended to begin by age 8, consideration should be given to the possibility of mutation testing in childhood.

There are reports of cases where individuals with a mutation in *STK11* have not inherited the mutation from a parent. In these cases the mutation has developed spontaneously in that individual (a de novo mutation). Once this occurs, the children of that individual are each at 50% risk of inheriting the mutation.[3]

References

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