SDHA gene

Associated Syndrome Name: Hereditary pheochromocytoma-paraganglioma syndrome (hereditary PPGL syndrome)

SDHA Summary Cancer Risk Table

CANCER	GENETIC CANCER RISK
Endocrine	High Risk
Other	Elevated Risk
Renal	Elevated Risk

SDHA gene Overview

Hereditary pheochromocytoma-paraganglioma syndrome (hereditary PPGL syndrome) [1, 2, 3, 4, 5, 6]

- Individuals with mutations in *SDHA* have hereditary pheochromocytoma-paraganglioma syndrome (hereditary PPGL syndrome).
- Individuals with hereditary PPGL syndrome due to mutations in *SDHA* have a high risk for cancers of the nervous system (paragangliomas), which can be in the head, neck, upper body or abdomen. There is also a high risk for paragangliomas of the adrenal gland (pheochromocytomas). Paragangliomas and pheochromocytomas can develop at young ages.
- Paragangliomas and pheochromocytomas in individuals with hereditary PPGL syndrome often secrete hormones that can cause symptoms such as high blood pressure, rapid and/or abnormal heartbeat, headaches, sweating, nausea, fatigue and anxiety.
- Individuals with hereditary PPGL syndrome due to *SDHA* mutations have an elevated risk for renal cancer and for gastrointestinal stromal tumors (GIST), mostly in the stomach. The exact level of these risks is not known.
- Some studies have shown that hereditary PPGL syndrome also includes an increased risk for other tumors and cancers, such as pituitary adenomas and neuroblastoma. However, the data are not conclusive at this time and there are currently no specific medical management guidelines related to these other tumors.
- There is variable tumor and cancer risk in individuals with *SDHA* gene mutations. Modified screening intervals may be considered.
- It is appropriate to offer genetic counseling to individuals with hereditary PPGL syndrome who are of reproductive age to discuss reproductive risks and options. There are additional considerations before and during pregnancy for women with hereditary PPGL syndrome.
- Although there are high risks for cancers and other medical conditions in individuals with hereditary PPGL syndrome, it may be possible to reduce these risks with appropriate medical management. Guidelines for the medical management of patients with hereditary PPGL syndrome have been developed by the National Comprehensive Cancer Network (NCCN) and international consensus. These are summarized below. Since hereditary PPGL syndrome is a complex condition, and management recommendations are likely to change over time, patients with *SDHA* mutations and a diagnosis of hereditary PPGL syndrome should be managed by a multidisciplinary team with expertise in medical genetics and the prevention and treatment of the complications associated with this condition.

SDHA gene Cancer Risk Table

CANCER TYPE	AGE RANGE	CANCER RISK	RISK FOR GENERAL POPULATION
Paraganglioma/Pheochromocytoma	To age 70 [2, 3, 4, 7]	10%	<0.1%
Renal	To age 80 [2, 7, 8]	Elevated risk	1.4%
Gastrointestinal Stromal Tumors (GIST)	To age 80 [3, 4, 6, 7]	Elevated risk	<0.1%

SDHA 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)
Paraganglioma/Pheochromocytoma	Clinical monitoring, including blood pressure measurement[1, 6, 9]	10 to 15 years, or at time of diagnosis of hereditary PPGL syndrome	Annually
	Biochemical screening of blood and urine[1, 9]	10 to 15 years	Every 1 to 3 years, depending on symptoms and findings, or prior to any surgical procedure
	Whole-body MRI. If not available, consider chest CT and MRI of abdomen, pelvis, skull base, and neck.[1, 9, 10]	10 to 15 years	Every 2 to 3 years
Renal	Abdominal MRI (preferred) or CT, with and without IV contrast.[8]	12 years	Every 2 years
Gastrointestinal Stromal Tumors (GIST)	Complete blood count and attention to symptoms such as gastric bleeding, obstruction, abdominal pain, nausea, etc.[6]	10 years	Annually

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 SDHA 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.

It is appropriate to offer genetic counseling to individuals with hereditary PPGL syndrome who are of reproductive age to discuss reproductive risks and options. There are additional considerations before and during pregnancy for women with hereditary PPGL syndrome.[3]

Since *SDHA* mutations carry a risk for complications in children and some screenings are recommended to begin at young ages, consideration should be given to mutation testing in childhood.

In rare instances, an individual may inherit mutations in both copies of the *SDHA* gene, leading to mitochondrial disease (such as mitochondrial complex II deficiency). These conditions are rare and symptoms can vary greatly from severe life-threatening symptoms in infancy to muscle disease beginning in adulthood. The children of this patient are at risk of inheriting these conditions only if the other parent is also a carrier of an *SDHA* mutation. A child of this patient may be at risk for these conditions even if the other parent does not yet have a diagnosis of hereditary PPGL syndrome. Screening the other biological parent of any children for *SDHA* mutations may be appropriate.[11]

References

1. Bergsland E, et al. NCCN Clinical Practice Guidelines in Oncology®: Neuroendocrine and Adrenal Tumors. V 3.2025. Oct 1. Available at https://www.nccn.org.

2. van der Tuin K, et al. Clinical Aspects of *SDHA*-Related Pheochromocytoma and Paraganglioma: A Nationwide Study. J Clin Endocrinol Metab. 2018 103:438-445. PMID: 29177515.

3. Else T, et al. Hereditary Paraganglioma-Pheochromocytoma Syndromes. 2023 Sep 21. In: Adam MP, et al., editors. GeneReviews® [Internet]. PMID: 20301715.

4. Fishbein L. Pheochromocytoma/Paraganglioma: Is This a Genetic Disorder? Curr Cardiol Rep. 2019 21:104. PMID: 31367972.

5. Dubard Gault M, et al. Germline *SDHA* mutations in children and adults with cancer. Cold Spring Harb Mol Case Stud. 2018 4: PMID: 30068732.

6. Rednam SP, et al. Update on Tumor Surveillance for Children with Hereditary Pheochromocytoma/Paraganglioma Syndromes. Clin Cancer Res. 2025 Aug 14;31(16):3368-3376. PMID: 40549645.

7. SEER*Explorer: An interactive website for SEER cancer statistics [Internet]. Surveillance Research Program, National Cancer Institute. [Cited 2025 Aug 12]. Available from https://seer.cancer.gov/explorer/.

8. Motzer RJ et al. NCCN Clinical Practice Guidelines in Oncology®: Kidney Cancer. V 1.2026. Jul 24. Available at https://www.nccn.org.

9. Casey RT, et al. International consensus statement on the diagnosis and management of phaeochromocytoma and paraganglioma in children and adolescents. Nat Rev Endocrinol. 2024 Aug 15. PMID: 39147856.

10. Greer MC, et al. Update on Whole-Body MRI Surveillance for Pediatric Cancer Predisposition Syndromes. Clin Cancer Res. 2024 Nov 15;30(22):5021-5033. PMID: 39287924.

11. Renkema GH, et al. *SDHA* mutations causing a multisystem mitochondrial disease: novel mutations and genetic overlap with hereditary tumors. Eur J Hum Genet. 2015 23:202-9. PMID: 24781757.

Last Updated on 10-Mar-2026