Hereditary Cancer Risk Assessment Tool

The MDHHS Hereditary Cancer Risk Assessment Tool was developed to help clinicians identify patients that would benefit from risk evaluation, genetic counseling and possible genetic testing for hereditary cancer syndromes.

This tool primarily assesses a patient's risk of **hereditary breast and ovarian cancer syndrome (HBOC)** and **Lynch syndrome (LS).**

The Centers for Disease Control and Prevention Public Health Genomics program classifies these two conditions as Tier 1 conditions - those for which there is sufficient evidence that identifying and appropriately managing individuals at increased risk improves health.

This tool does not identify individuals at risk for all hereditary cancer syndromes. If you have questions or concerns about your patient's risk, contact a genetics provider.

How to Use this Tool

1. Go through the questions with your patient.
2. Follow the arrows corresponding to a "YES" or "NO" answer. Use the tabs at the bottom to easily access the relevant section.

Definitions of Hereditary Breast and Ovarian Cancer (HBOC) and Lynch Syndrome (LS)

HBOC-related cancers (also referred to as *BRCA*-related cancers):

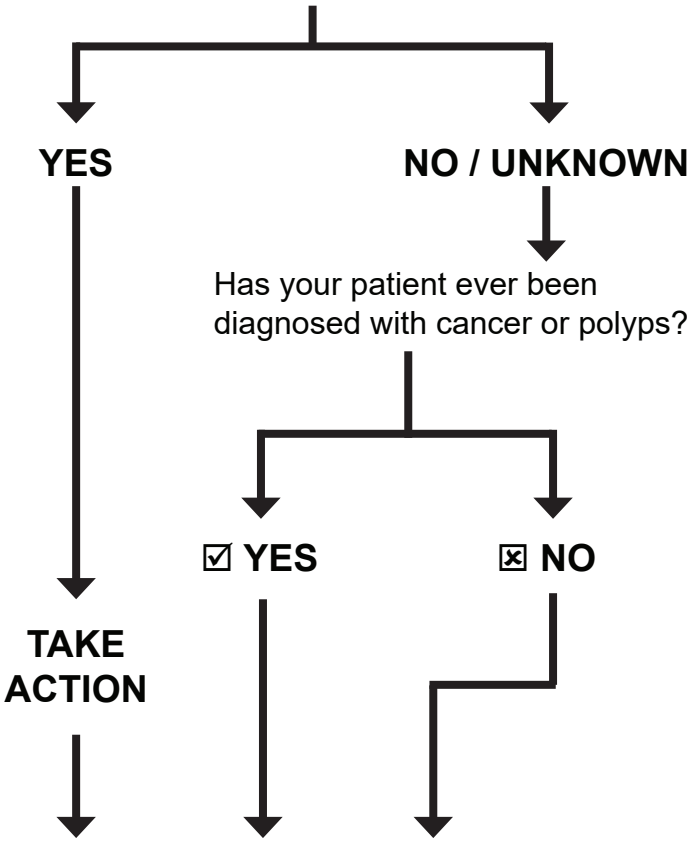
- breast cancer (male and female)
- ovarian cancer (includes fallopian tube and primary peritoneal cancer)
- high grade (Gleason score ≥ 7) or metastatic prostate cancer
- pancreatic cancer
- melanoma

LS-related cancers/tumors:

- colorectal cancer
- endometrial cancer
- gastric cancer
- ovarian cancer
- pancreatic cancer
- ureter and renal pelvis cancer
- brain tumors (usually glioblastoma)
- biliary tract cancer
- small intestinal cancer
- sebaceous adenomas
- sebaceous carcinomas
- keratoacanthoma

ASSESSMENT STARTS HERE

Does your patient have a blood relative with a germline mutation (pathogenic or likely pathogenic variant) in a cancer predisposition gene such as *BRCA1, BRCA2*, the Lynch syndrome genes (*MLH1, MSH2, MSH6, PMS2, EPCAM*), or others?



Definition of Family Relationships

The following are considered close relatives:

- 1st degree blood relatives (parents, siblings, children)
- 2nd degree blood relatives (grandparents, grandchildren, aunts, uncles, half-siblings)
- 3rd degree blood relatives, as used in risk assessment specifically related to *BRCA1/2* testing criteria, and/or when a patient has a small family that makes it difficult to adequately assess risk based on just 1st and 2nd degree relatives

Color and Symbol Key for Risk Evaluation

* If yes, evaluate hereditary risk for the appropriate gene.

● If yes, evaluate for HBOC/other hereditary breast cancer syndromes.

▸ If yes, evaluate for Lynch/other hereditary colorectal cancer syndromes.

■ If yes, evaluate for HBOC, Lynch and other hereditary cancer syndromes.

◢ If yes, evaluate for hereditary colorectal/ polyposis cancer syndromes.

A. Risk Evaluation for Patients with Cancer

* 1. Has your patient had a tumor profiling test that shows a mutation (pathogenic or likely pathogenic variant) in a cancer predisposition gene?

2. Has your patient been diagnosed with any of the following?

- Breast cancer diagnosed at ≤45y
- Triple negative breast cancer (ER-, PR-, HER2-) at ≤60y
- Breast cancer diagnosed at any age and ANY of the following:
  - ◊ Ashkenazi Jewish ancestry
  - ◊ ≥2 primary breast cancers in the same person
  - ◊ ≥1 close relative with breast cancer ≤50y OR invasive ovarian cancer OR male breast cancer OR pancreatic cancer OR metastatic prostate cancer
  - ◊ ≥2 close relatives with breast cancer at any age
- Male breast cancer at any age
- Metastatic prostate cancer at any age
- High-grade (Gleason ≥7) prostate cancer and Ashkenazi Jewish ancestry

- ▶ Colorectal cancer at <50y
- ▶ Colorectal cancer ≤60y with presence of tumor-infiltrating lymphocytes, Crohn's–like lymphocytic reaction, mucinous or signet ring differentiation, OR medullary growth pattern

- ■ Ovarian cancer at any age
- ■ Endometrial cancer <50y
- ■ Pancreatic cancer at any age
- ■ Colorectal or endometrial cancer at any age and ANY of these:
  - ◊ Diagnosis of another LS-related cancer
  - ◊ Evidence of mismatch repair deficiency thru tumor profiling
  - ◊ ≥1 close relative with LS-related cancer at <50y
  - ◊ ≥2 close relatives with LS-related cancer at any age on the same side of the family

- ◢ ≥10 adenomatous polyps OR ≥2 hamartomatous polyps OR ≥5 serrated polyps proximal to the sigmoid colon

☑ YES to any → **☑ With Cancer**

☒ NO

Color and Symbol Key for Risk Evaluation

* If yes, evaluate hereditary risk for the appropriate gene.

● If yes, evaluate for HBOC/other hereditary breast cancer syndromes.

▸ If yes, evaluate for Lynch/other hereditary colorectal cancer syndromes.

■ If yes, evaluate for HBOC, Lynch and other hereditary cancer syndromes.

◢ If yes, evaluate for hereditary colorectal/ polyposis cancer syndromes.

B. Family History: Risk Evaluation for Patients without Cancer

Does your patient have a family history of any of the following in close blood relatives?

* Blood relative with a known germline mutation (pathogenic or likely pathogenic variant) in a cancer predisposition gene

- 1st or 2nd degree relative with ANY of the following:
  - ◊ Breast cancer at ≤45y
  - ◊ Triple-negative breast cancer (ER-, PR-, HER2-) at ≤60y
  - ◊ Male breast cancer OR metastatic prostate cancer
  - ◊ Ashkenazi Jewish ancestry and ≥2 primary types of BRCA-related cancer
  - ◊ ≥2 breast primary cancers in a single person ≤50y
- Close relative with breast cancer ≤50y and ANY of the following on the same side of the family:
  - ◊ Another close relative with breast cancer at any age
  - ◊ Another close relative with high-grade prostate cancer
- ≥3 close relatives on the same side of the family with breast cancer at any age

- ■ ≥1 1st degree relative with colorectal or endometrial cancer diagnosed at <50y
- ■ ≥1 1st degree relative with colorectal or endometrial cancer AND another LS-related cancer
- ■ 1st or 2nd degree relative with ovarian cancer at any age
- ■ 1st or 2nd degree relative with pancreatic cancer at any age
- ■ ≥2 1st or 2nd degree relatives with LS cancer including ≥1 <50y
- ■ ≥3 1st or 2nd degree relatives with LS cancer regardless of age

- ◢ ≥1 1st or 2nd degree relative with ≥10 adenomatous polyps, ≥2 hamartomatous polyps, OR ≥5 serrated polyps

☑ YES to any ↓

NO ↓

☒ No Cancer

Patients with Increased Risk of Hereditary Cancer: TAKE ACTION

If you checked “yes” for any of the criteria listed in the previous sections, **your patient meets criteria for further cancer risk assessment, genetic counseling and possible genetic testing.**

Depending on your level of expertise and comfort with cancer genetics, you can either provide these services yourself or refer your patient to a genetics professional. You can find a directory of cancer genetics professionals in Michigan at:

https://bit.ly/31VqFT2

TAKE ACTION

Patients Without Known Risks of Hereditary Cancer: MANAGE

If your patient does not meet any of the criteria listed in previous sections, take the following steps:

- Manage as appropriate based on the patient's personal and family medical history.
- Update family history and review this checklist annually since new information may become available over time, changing risk assessment.

Remember, this is a screening tool and will not identify all patients at increased risk of hereditary cancer.

If you have questions or concerns about your patient's personal or family medical history of cancer, contact a cancer genetics provider. A directory of cancer genetics professionals in Michigan is located at:

https://bit.ly/31VqFT2

For a mobile-friendly version, visit

www.migrc.org/cancer-risk

MDHHS
Michigan Department of Health & Human Services

MI Cancer Genomics Program
www.michigan.gov/hereditarycancer

(Rev. 07/19)
For updated guidelines, visit www.nccn.org and www.uspreventiveservicestaskforce.org.

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