Gastrointestinal Tumors/Cancer

For your patients with cancer

- **Blood relative with a known germline mutation[1] in a cancer predisposition gene**
- **Any gastrointestinal cancer, regardless of age, with a known mutation[1] in a cancer predisposition gene found on tumor profiling**
- Colorectal cancer with ANY of the following:
  - ◊ Diagnosis at <50y
  - ◊ Mismatch repair deficiency on tumor profiling
  - ◊ Another LS-related cancer[3] in the patient
  - ◊ ≥1 close relative[2] with LS-related cancer[3] diagnosed <50y
  - ◊ ≥2 close relatives[2] with LS-related cancer[3]
- **Pancreatic cancer at any age**
- Diffuse gastric cancer with ANY of the following:
  - ◊ Diagnosis <40y
  - ◊ Lobular breast cancer in the same person
  - ◊ Lobular breast cancer in a close relative, ≥1 diagnosed at <50y
- Gastric cancer with any of the following:
  - ◊ ≥1 close relative[2] with gastric cancer, ≥1 diagnosed at <50y
  - ◊ ≥3 cases of gastric cancer on the same side of the family at any age
  - ◊ Close relative[2] with lobular breast cancer <50y
  - ◊ ≥2 additional cases of LS-related cancer[3] in the same person or in close relatives[2]
- 3-5 juvenile polyps OR ≥10 adenomatous polyps OR ≥5 serrated polyps OR ≥2 hamartomatous polyps in the patient
- LS-related cancer[3] AND ≥5% risk of MMR gene mutation[1] based on predictive models

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[3] ***Lynch syndrome (LS)-related cancers:*** *colorectal, endometrial, gastric, ovarian, pancreatic, ureter and renal pelvis, brain (usually glioblastoma), biliary tract, small intestine, sebaceous adenoma, sebaceous carcinoma, keratoacanthoma*
[4] ***HBOC/BRCA-related cancers:*** *breast (male and female), ovarian, metastatic prostate, pancreatic, melanoma*

For your patients NOT affected with cancer

- **Blood relative with a known germline mutation[1] in a cancer predisposition gene**
- ≥1 1st degree relative with ANY of the following:
  - ◊ Colorectal cancer or endometrial cancer diagnosed <50y
  - ◊ Colorectal or endometrial cancer, AND another LS-related cancer[3]
  - ◊ Pancreatic cancer with ≥2 additional cases of LS-related cancer[3] in close relatives[2]
  - ◊ Pancreatic cancer and melanoma in the same person OR pancreatic cancer and Ashkenazi Jewish ancestry
  - ◊ Diffuse gastric cancer <40y
  - ◊ Diffuse gastric cancer and lobular breast cancer in the same person
  - ◊ Diffuse gastric cancer with lobular breast cancer in another relative on the same side of the family, ≥1 diagnosed <50y
  - ◊ Gastric cancer with ≥2 additional cases of LS-related cancer[3] in the same person or a close relative[2]
- ≥1 close relative[2] with polyposis
- ≥2 close relatives[2] with LS-related cancer[3] including ≥1 diagnosed <50y
- ≥3 close relatives[2] with LS-related cancer[3] regardless of age
- ≥2 cases of gastric cancer, ≥1 diagnosed <50y
- ≥3 cases of gastric cancer, ≥1 in a 1st degree relative, regardless of age
- ≥3 cases of pancreatic cancer OR pancreatic cancer and/or melanoma in close relatives[2]
- An unaffected individual with a ≥5% risk of having an MMR gene mutation[1] based on predictive models (PREMM5, MMRpro, MMRpredict)

Based on NCCN guidelines as of 7/2019.
For recent updates, visit www.nccn.org.
For more information, visit
www.michigan.gov/hereditarycancer

Michigan Cancer Genetics Alliance

Cancer-Specific Risk Factors for Referral for Hereditary Cancer Risk Assessment and Counseling

Pancreatic Cancer

For your patients with cancer

- **Pancreatic cancer at any age**

The criteria below are further indications of the value of a referral for genetic counseling:

- Ashkenazi Jewish ancestry (for hereditary breast and ovarian cancer syndrome (HBOC))
- A known germline mutation[1] in a cancer predisposition gene in the family
- A known mutation[1] in a cancer predisposition gene found on tumor profiling
- ≥1 close relative[2] with pancreatic cancer
- ≥2 close relatives[2] with breast, ovarian, and/or high grade prostate cancer (Gleason score ≥7)
- ≥3 close relatives[2] with pancreatic cancer and/or melanoma

For your patients NOT affected with cancer

- Close relative[2] who meets any of above criteria
- Blood relative with a known germline mutation[1] in a cancer predisposition gene

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[1] ***Mutation*** *= pathogenic or likely pathogenic variant*
[2] ***Close relative*** *= 1st or 2nd degree relative (brothers, sisters, parents, children; aunts, uncles, grandparents, half-brothers, half-sisters, nieces, nephews)*

Breast Cancer

For your patients with cancer
- **A known germline mutation[1] in a cancer predisposition gene in the family**
- **A known mutation[1] in a cancer predisposition gene found on tumor profiling**
- **A female with breast cancer ≤50y**
- **Triple negative breast cancer (ER-,PR-, HER2-) diagnosed at ≤60y**
- **≥2 primary breast cancers in the same person**
- **Male with breast cancer at any age**
- **Ovarian cancer at any age**
- **Pancreatic cancer at any age**
- **Metastatic prostate cancer at any age**
- **High grade (Gleason score ≥7) prostate cancer and Ashkenazi Jewish ancestry**
- **Breast cancer at any age and Ashkenazi Jewish ancestry**
- Breast cancer at any age with ANY of these:
  - ◊ ≥1 close relative[2] with breast cancer ≤50y
  - ◊ ≥1 close relative[2] with invasive ovarian cancer at any age
  - ◊ ≥1 male relative with breast cancer at any age
  - ◊ ≥1 close relative[2] with pancreatic cancer
  - ◊ ≥1 close relative[2] with metastatic prostate cancer
  - ◊ ≥2 close relatives[2] with breast cancer (any age)
- Personal and/or family history of ≥3 of the following cancers, including multiple primaries in one person: breast, lobular breast, sarcoma, adrenocortical carcinoma, brain tumor, leukemia, diffuse gastric cancer, colon, endometrial, thyroid, kidney, dermatologic manifestations, macrocephaly, adenomatous or hamartomatous polyps of the GI tract, ovarian sex cord tumors, pancreatic, testicular sertoli tumors, childhood skin pigmentation variations
- Lobular breast cancer and diffuse gastric cancer in the same person, or lobular breast cancer with diffuse gastric cancer in a close relative[2], one diagnosed <50y

For your patients NOT affected with cancer
- **Blood relative with a known germline mutation[1] in a cancer predisposition gene**
- Close relative[2] with:
  - ◊ Breast cancer ≤45
  - ◊ Ovarian cancer at any age
  - ◊ Male breast cancer
  - ◊ Metastatic prostate cancer
  - ◊ Pancreatic cancer
- ≥2 breast cancer primaries in the same relative
- ≥2 individuals on the same side of the family with breast cancer primaries, at least one diagnosed ≤50y
- Family history of ≥3 of the following cancers on the same side of the family especially if diagnosed ≤50y, can include multiple primaries in an individual: breast, sarcoma, adrenocortical carcinoma, brain tumor, leukemia, diffuse gastric, lobular breast, colon, endometrial, thyroid, kidney, dermatologic manifestations, macrocephaly, adenomatous or hamartomatous polyps of the GI tract, ovarian sex chord tumors, pancreas, testicular sertoli tumors, childhood skin pigmentation disorders

Gynecologic Cancer

For your patients with cancer
- **Blood relative with a known germline mutation[1] in a cancer predisposition gene**
- **Known mutation[1] in a cancer predisposition gene found on tumor profiling**
- **Ovarian, fallopian, non-epithelial ovarian, or primary peritoneal cancer at any age**
- Ovarian sex cord tumor with annular tubules
- Ovarian small cell carcinoma, hypercalcemic type
- Endometrial cancer at <50y
- Endometrial cancer showing mismatch repair (MMR) deficiency on tumor profiling

- Endometrial cancer at any age AND
  - ◊ Another LS-related cancer[3] OR
  - ◊ ≥1 close relative[2] with LS-related cancers[3] at <50y, OR
  - ◊ ≥2 close relatives[2] with colorectal, endometria endometrial, ovarian, gastric, small bowel, or other LS-related cancer[3]
- Individual with LS-related gynecological cancer[3] with ≥2.5% risk of MMR gene mutation[1] based on predictive models (PREMM5, MMRpro, MMRpredict)
- Endometrial and/or colorectal cancer in the same person

For your patients NOT affected with cancer
- **Blood relative with a known germline mutation[1] in a cancer predisposition gene**
- ≥1 1st degree relative with ANY of the following:
  - ◊ Ovarian sex cord tumor with annular tubules OR an ovarian small cell carcinoma, hypercalcemic type
  - ◊ Endometrial or colorectal cancer at <50y
  - ◊ Endometrial or colorectal cancer and another LS-related cancer[3] at any age
- ≥1 close relative[2] with ANY of the following:
  - ◊ ovarian cancer, male breast cancer, or metastatic prostate cancer at any age, or breast cancer at ≤50y
  - ◊ 2 primary types of BRCA-related cancers[4] and Ashkenazi Jewish ancestry
  - ◊ ≥2 breast primaries in a single person
- ≥2 close relatives[2] with ANY of the following:
  - ◊ Breast cancer primaries on the same side of the family, at least 1 diagnosed ≤50y
  - ◊ LS-related cancers[3] including ≥1 diagnosed <50y
- ≥3 close relatives with LS-related cancer[3] regardless of age
- ≥5% risk of an MMR gene mutation[1] based on predictive models (PREMM5, MMRpro, MMRpredict)