PASS IT ON

For Individuals and Families With a History of Cancer

Newsletter of the Cancer Genetic Counseling Service

THE EVOLUTION OF GENETIC TESTING

MORE DATA, LARGER PANELS, & UPDATED SCREENING GUIDELINES

It probably comes as no surprise that the landscape of hereditary cancer genetic testing has continued to evolve over the past decade. The field has moved from a testing strategy that initially focused on genetic testing for a single gene or hereditary cancer syndrome to a more expanded approach of testing multiple genes simultaneously or what is more commonly referred to as **panel testing.**

GENES	BREAST	OVARIAN	COLORECTAL	UTERINE	PANCREATIC	PROSTATE	STOMACH	MELANOMA	OTHERS
APC			✓		✓				✓
BMPR1A			✓				✓		
BRCA1	✓	✓			✓	✓			✓
BRCA2	✓	✓			✓	✓		✓	✓
CDH1	✓						✓		✓
CDKN2A					✓			✓	✓
CDK4								✓	✓
EPCAM		✓	✓	✓	✓	✓	✓		✓
MLH1		✓	✓	✓	✓	✓	✓		✓
MSH2		✓	✓	✓	✓	✓	✓		✓
MSH6		✓	✓	✓	✓	✓	✓		✓
MUTYH biallelic	✓		✓	✓					
PMS2		✓	✓	✓	✓	✓	✓		✓
PTEN	✓		✓	✓				✓	✓
SMAD4			✓				✓		
STK11	✓	✓	✓		✓				✓
TP53	✓	✓	✓	✓	✓	✓	✓	✓	✓

While it was once commonplace for individuals to be tested for only BRCA1/BRCA2 mutations or Lynch syndrome (MLH1, MSH2, MSH6, PMS2, EPCAM), panels today often have upwards of 75-100 genes (see the illustrated example above). This expanded testing approach increases the likelihood that a mutation will be identified in a family. **We commonly recommend that individuals tested for less than 25 genes at the time of their initial genetic counseling appointment, consider making another genetic counseling appointment to discuss these updated testing options.**

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BARBARA ANN Karmanos CANCER INSTITUTE Wayne State University

In addition to discovering new genes implicated in hereditary cancer, we are also continuing to learn more about the genes that have been on the testing menu for some time. When an individual tests positive for a genetic mutation, the recommendations provided at the time of disclosure are based on the most current and up-to-date guidelines available. It is important to remember that these recommendations may change over time as more is learned about that specific gene or mutation.

As such, our clinic provides the opportunity for virtual yearly follow-up appointments to ensure that you have the most up-to-date information about your genetic mutation. These annual follow-up visits include reviewing any updated management and screening recommendations that may be crucial for maintaining the health of you and your family. They also allow us to update your family history, discuss genetic testing for your at-risk family members, and answer any questions that you have regarding your genetic testing results.

In fact, we would like to share new information that has recently come to light regarding a few genes many of you may have previously been tested for. **Over this past year, new data and guidelines have emerged concerning mutations in the NBN and RAD50 genes.**

New data has suggested that mutations in these two genes is now no longer definitively associated with an increased risk for breast cancer. If you previously tested positive at our clinic for a mutation in the NBN or RAD50 gene, you should have received an amended report and/or letter of explanation from your genetic counselor.

The reason for the amendment is because new information provided by the National Comprehensive Cancer Network (NCCN) as part of ongoing research has shown insufficient evidence that the RAD50 and NBN genes are associated with a higher risk of breast cancer. **Annual breast MRI is no longer officially recommended for females with a RAD50 or NBN mutation; however, this type of enhanced breast cancer screening may still be recommended to some women based on their personal and/or family history of breast cancer.**

When it comes to genetics, we are always learning more and you can count on the Karmanos Cancer Genetic Counseling Service to provide you with the most up-to-date information about your genetic testing results and testing options. We know how important genetics can be for individuals and families with a history of cancer! Please don't hesitate to contact us at 313-576-8748 or genetics@karmanos.org with questions.

TIPS FOR SHARING YOUR GENETIC INFORMATION

Telling Relatives What They *NEED* to Know

WHY SHOULD I SHARE?

It can save the lives of your relatives!

Genetic mutations increase the risk for certain cancers. Relatives may need special screening to prevent or detect cancer early.

WHAT TO SHARE?

Your genetic test report.

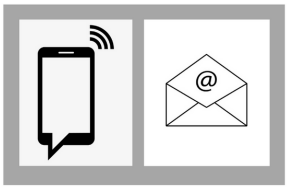
Your family tree made by your genetic counselor or doctor.

The letter from your genetic counselor explaining the results and what they mean for your family.

HOW CAN I SHARE?

Phone Calls - Text Messages - Emails
Postal Mail - Social Media Messaging

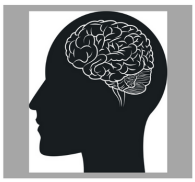
Sharing at holidays or family reunions can be a great way to tell everyone at once!



SHARING DIFFICULT INFORMATION

It can be overwhelming to share sensitive information with relatives about their risks, and may bring up unexpected emotions.

While it may be unconfortable, this information is crucial for relatives to have in order to make their own choices.



TESTING FOR RELATIVES

If a relative has your genetic test report, they can have testing with a doctor or genetic counselor in any state.

Some labs offer free testing to relatives for a limited time after your positive result to make it easier for your family.

THINGS TO REMEMBER

You do not need to be an expert to share, genetics is complicated!

There are a variety of professionals, like genetic counselors, and resources you can direct relatives to for help.

RESOURCES FOR YOU AND FAMILY

- Karmanos Cancer Genetic Counseling Service
- FORCE at FacingOurRisk.org
- LynchCancers.com
- BreastCancerAlliance.org
- FindAGeneticCounselor.nsgc.org
- KinTalk.org

KARMANOS

Visit us at www.karmanos.org/karmanos/genetic-counseling-at-karmanos

Or call us at 1-800-527-6266 to schedule an appointment. No referrals needed!

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GENE SPOTLIGHT: *PTEN*

Mutations in this gene are associated with *PTEN* Hamartoma Tumor Syndrome (PHTS). A subset of patients with PHTS may have a diagnosis of other syndromes such as Cowden syndrome, Bannayan-Riley-Ruvalcaba syndrome (BRRS), *PTEN*-related Proteus syndrome (PS) or *PTEN*-related Proteus-like syndrome.

What are the cancer risks associated with PTEN mutations?

	PTEN associated Cancer risk (to age 70)	Cancer risk for General Population (to age 70)
Colorectal	9-16%	1.8%
Endometrial	19-28%	1.7%
Female Breast	77-85%	7.1%
Melanoma	Up to 6%	1.1%
Thyroid	21-38%	1%
Kidney	15-34%	0.9%

Does it have other features ?

PHTS is associated with hamartomas, which are non-cancerous tumor-like growths. These are often seen on the skin and mucus membranes. Benign breast lumps, colon polyps, uterine fibroids, and thyroid nodules can be seen as well. A type of benign brain tumors (called Lhermitte-Duclos disease) is also possible.

Other associated features can include:

- Macrocephaly (larger head size)
- Intellectual disability and developmental delay
- Autism spectrum disorders

Are there screening or management options?

Yes. It looks different for each organ:

Colon	Begin colonoscopies no later than age 35 and repeat at least every 5 years.
Endometial	Consider starting screening at age 35 with endometrial biopsy (repeating every 1-2 years) and monitoring of symptoms (such as abnormal bleeding). Consider hysterectomy (surgical removal of uterus) after childbearing complete.
Female Breast	Clinical breast exams should occur every 6-12 months beginning no later than age 25. Annual mammogram and breast MRI beginning no later than age 35. A risk-reducing mastectomy is an option some women choose for personal reasons.
Thyroid	Annual thyroid ultrasound beginning at age 7.
Kidney	Consider beginning renal ultrasounds at age 40, repeating every 1-2 years.
Skin	Annual dermatology exams.

Are family members also at risk?

Yes. PHTS is an autosomal dominant condition. This means that first-degree family members (like children, siblings, and parents) have a 50% chance of also testing positive for a mutation in the PTEN gene. Some individuals, even those within the same family, will have more or different symptoms than others. PHTS impacts each individual uniquely.

Infographic created by Katie Townsend

Did you know we have a website dedicated to providing information and helpful resources regarding hereditary cancer and the Karmanos Cancer Genetic Counseling Service?

Please visit:
karmanos.org/karmanos/genetic-counseling-at-karmanos

On this site, you will find a list of helpful FAQs, more information about our team & service, as well as links to all of our previous newsletters.

Currently, most genetic counseling sessions are being conducted over the telephone or via our secure video platform.

Coming Soon: Option for in-person genetic counseling sessions at the Detroit and Weisberg locations!

If you have questions about upcoming genetic counseling visits or scheduling, please email us at genetics@karmanos.org or call 313-576-8748.

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