

Genetic Relationships in Cancer:

The latest on genetic testing,
panel testing, and the importance
of talking to family members!

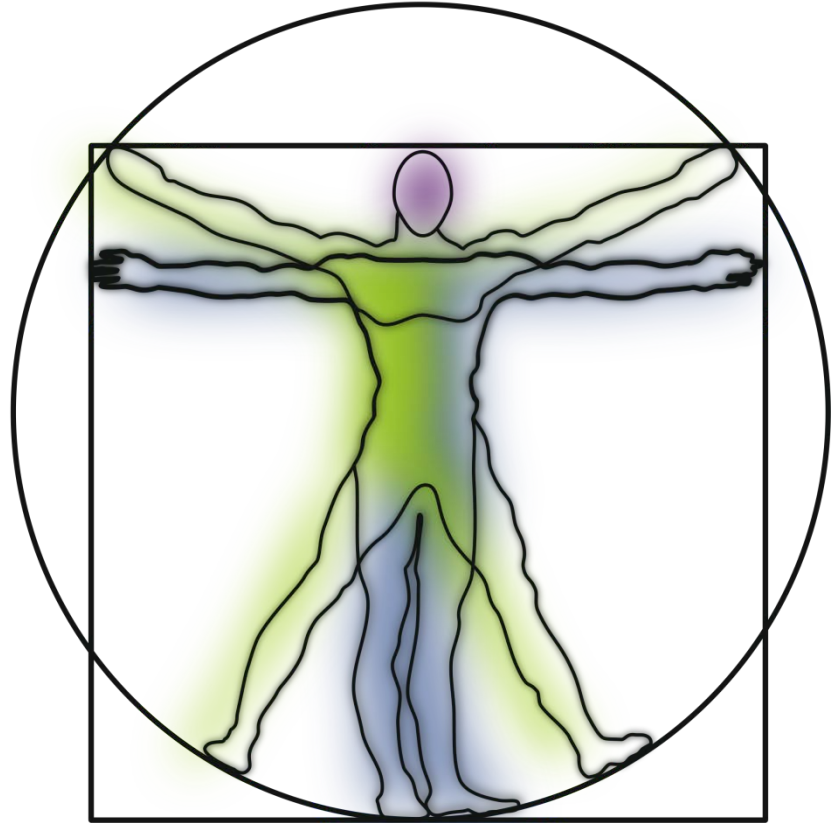
Julie Simon, MS LCGC
Genomics Institute
MultiCare Health System

Overview

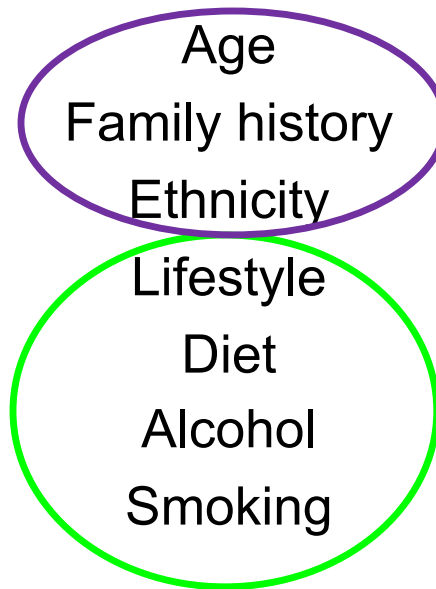
- What are the risk factors to develop cancer?
- When is cancer genetic?
- Why do I need to talk my family about their medical history?
- What is the deal with genetic testing?
- How can a genetic counselor help?

Common Diseases

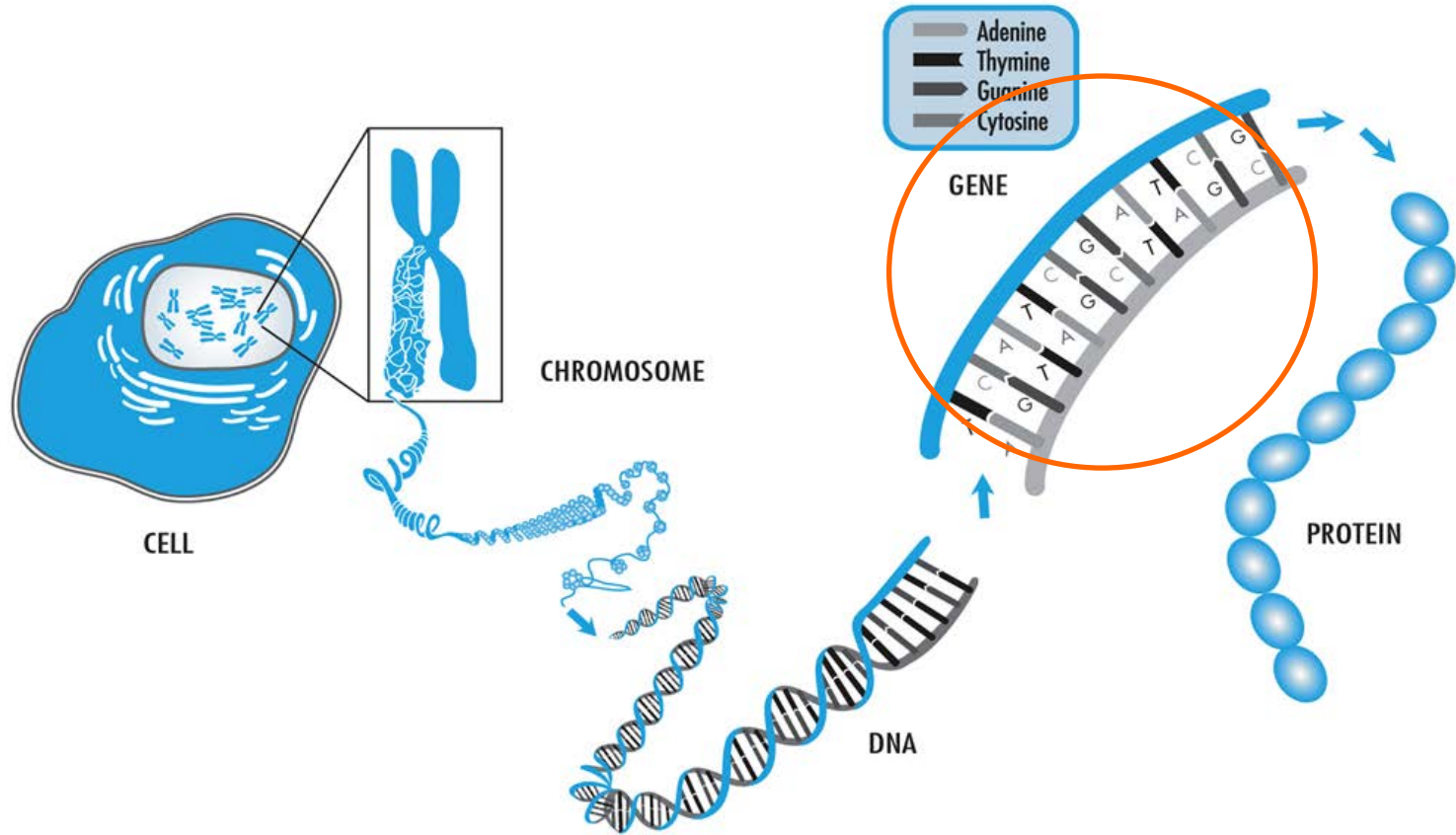
- Cancer
- Heart disease
- Diabetes
- Hypertension
- Stroke
- Alzheimer's
- Arthritis
- Osteoporosis



Common Risk Factors



What is a gene?



CHROMOSOME



DNA



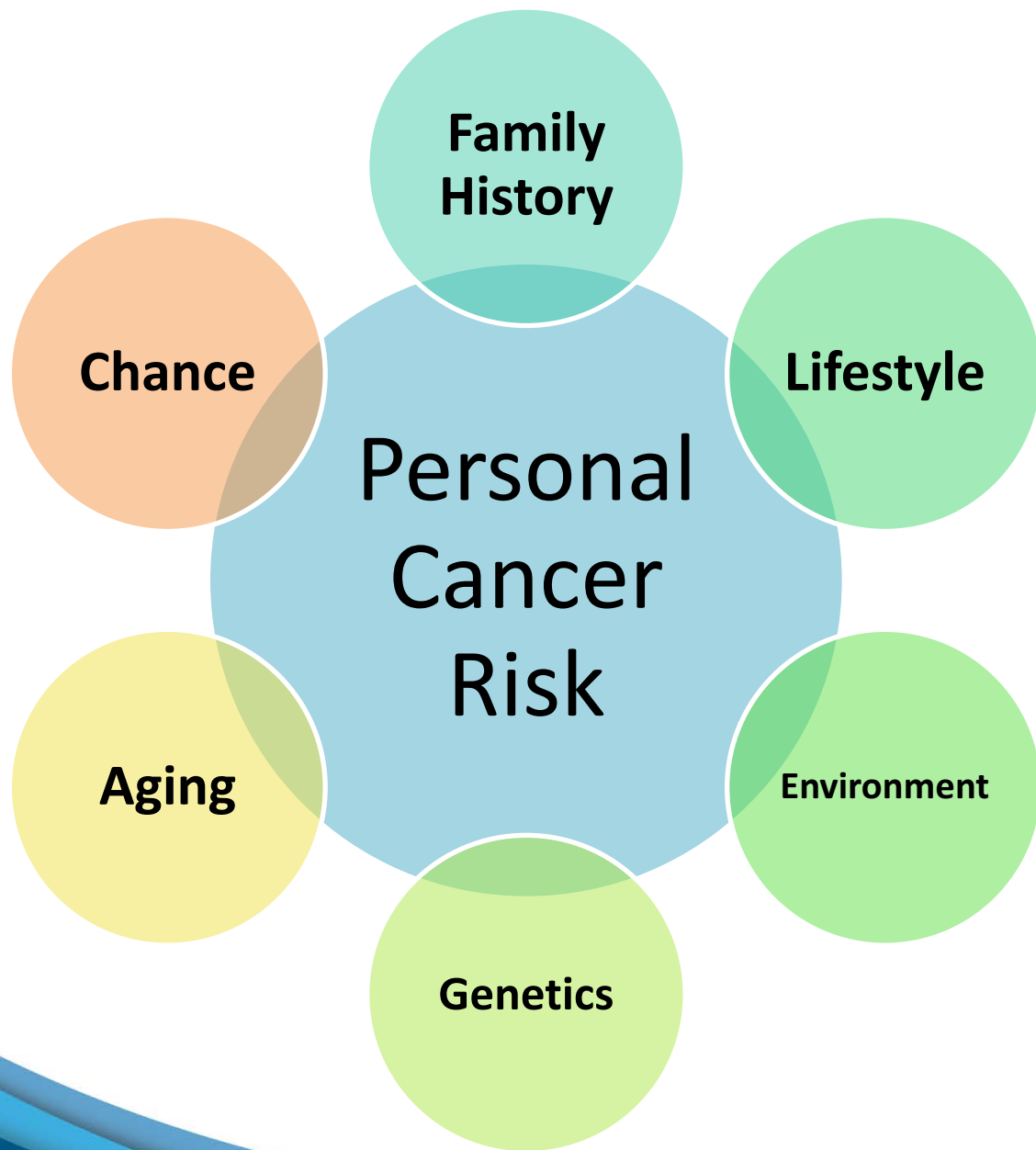
GENE



PROTEIN





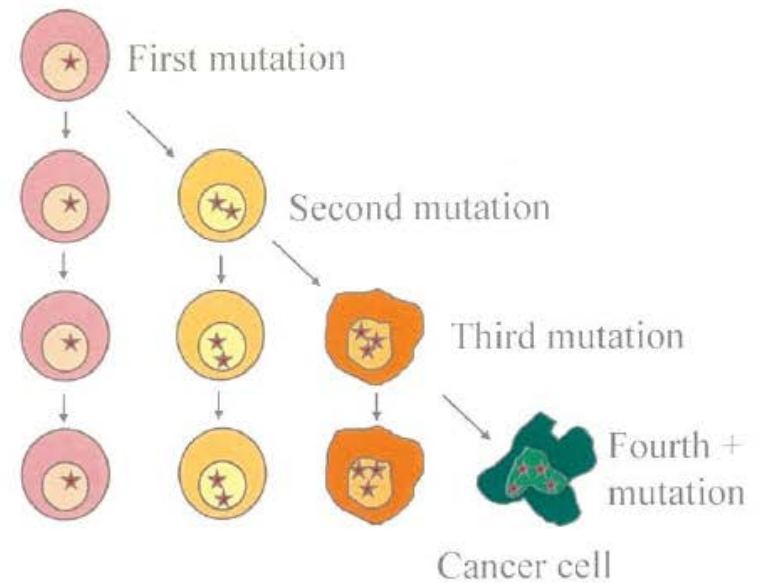
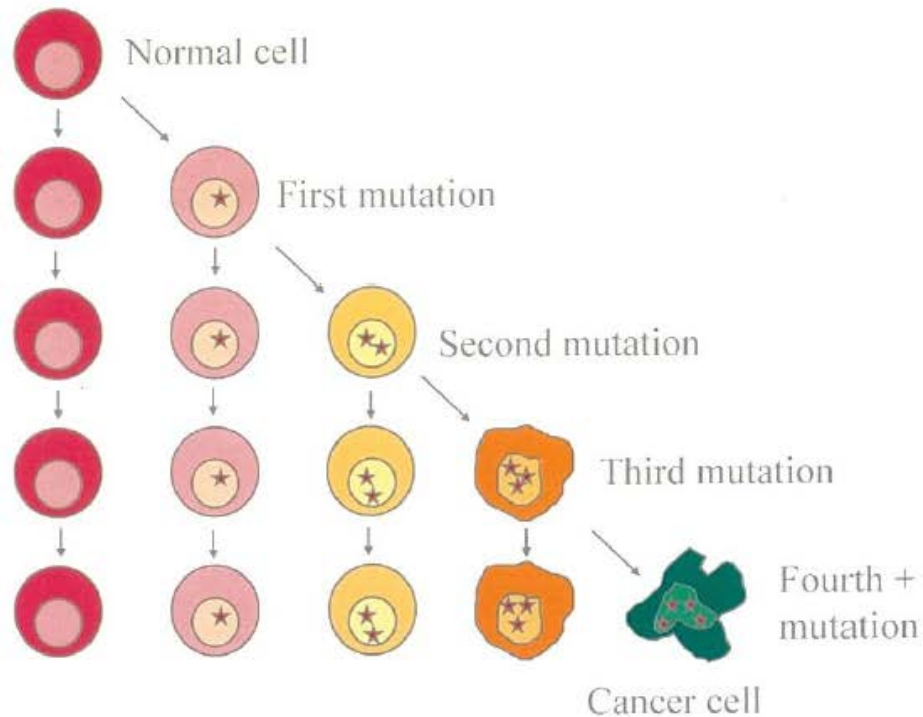


- **All cancer is genetic
but
most cancer is NOT inherited**



All Cancer is Genetic

Not All Cancer is Inherited

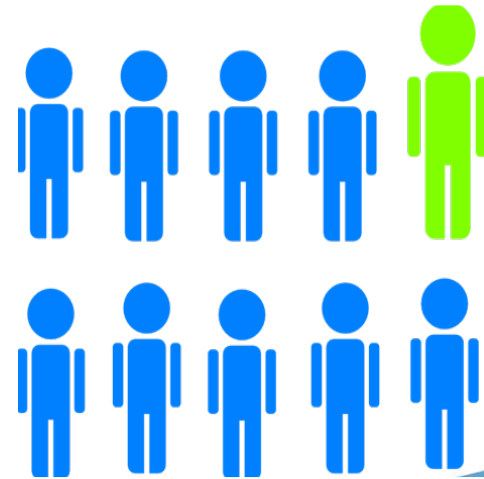


Cancer and Genetics

10%

Percentage of
cancers due to
inherited genetic risk

i.e. 1 out of 10



Pearl of Wisdom #1

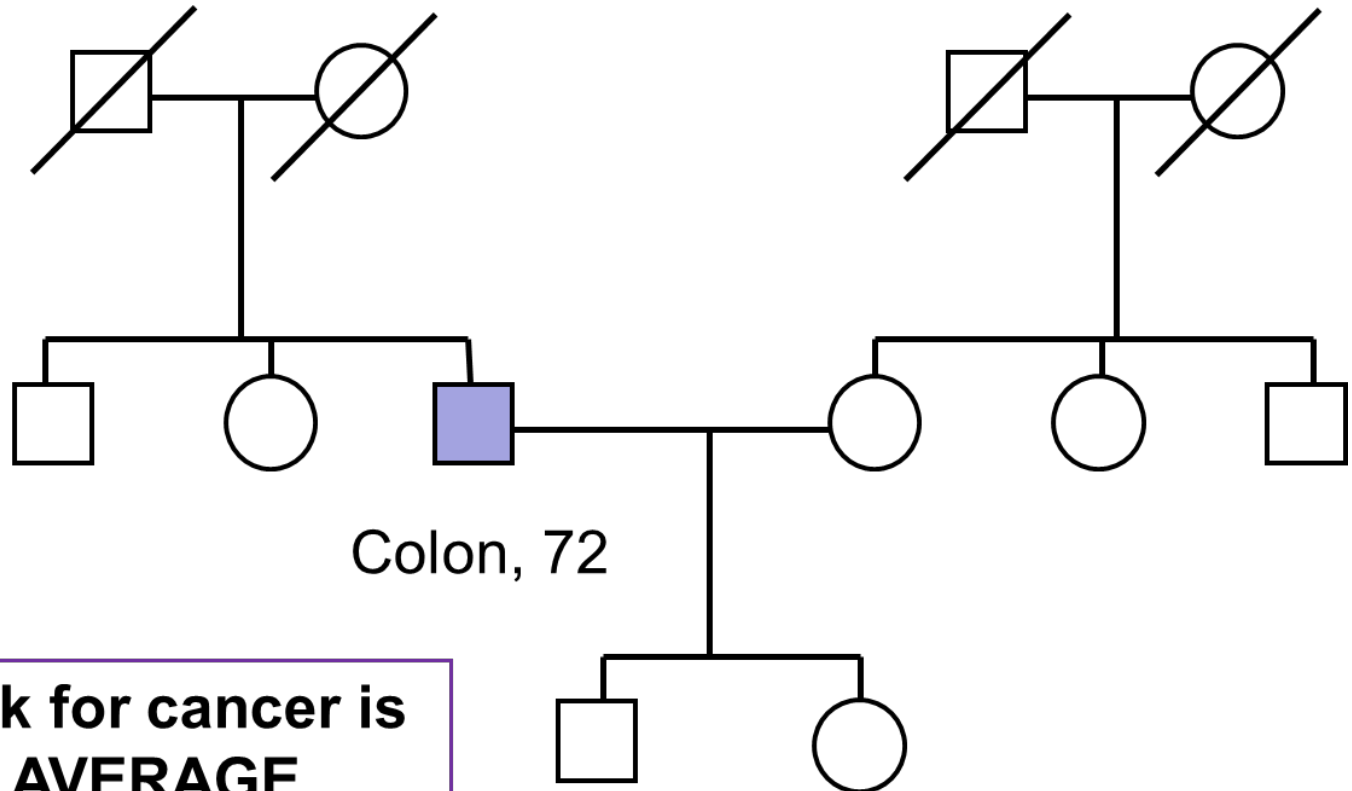
Family history
was the first
genetic test



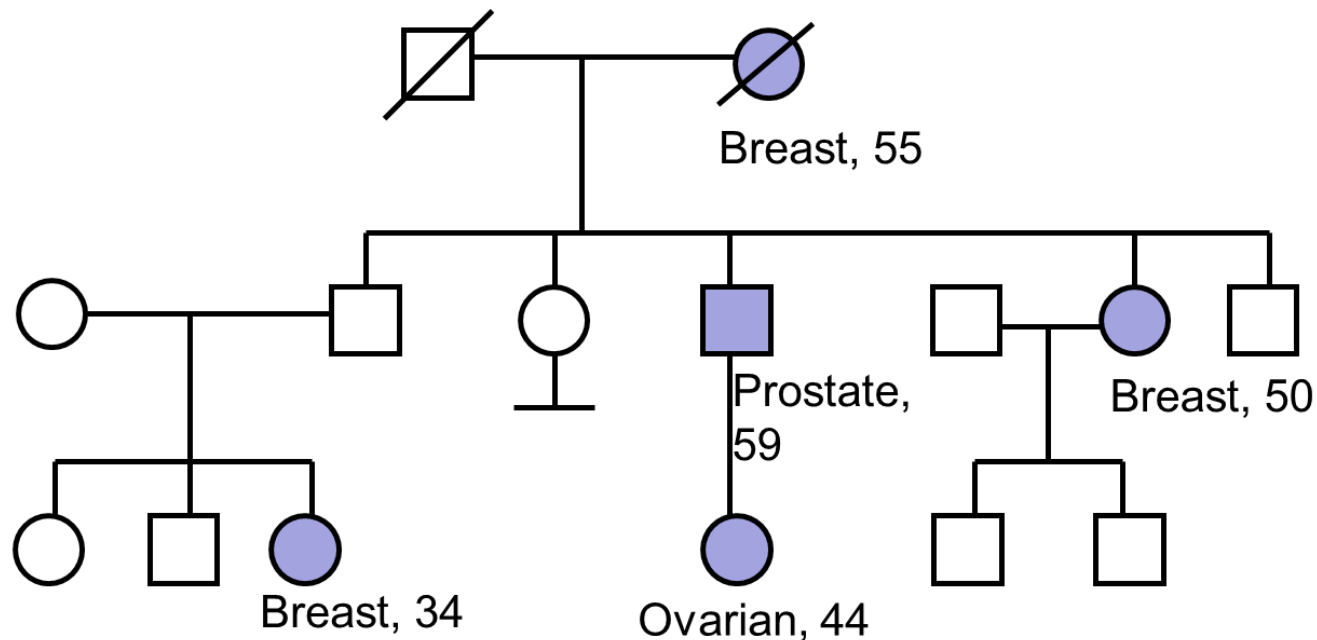
Clues: Genetic Risk for Cancer

- YOUNG
 - Breast <45, Colon <50
- RARE
 - Such as Ovarian, Male Breast, Pancreatic
- MULTIPLE
 - Two or more different cancers in the same person
- FAMILY
 - 2+ family members with the same or related types of cancer.
 - Breast/Ovary. Breast/Thyroid/Uterine. Breast/Sarcoma/Brain

Sporadic Family History



Hereditary Family History



**Risk for cancer is
HIGH**

Pearl of Wisdom #2

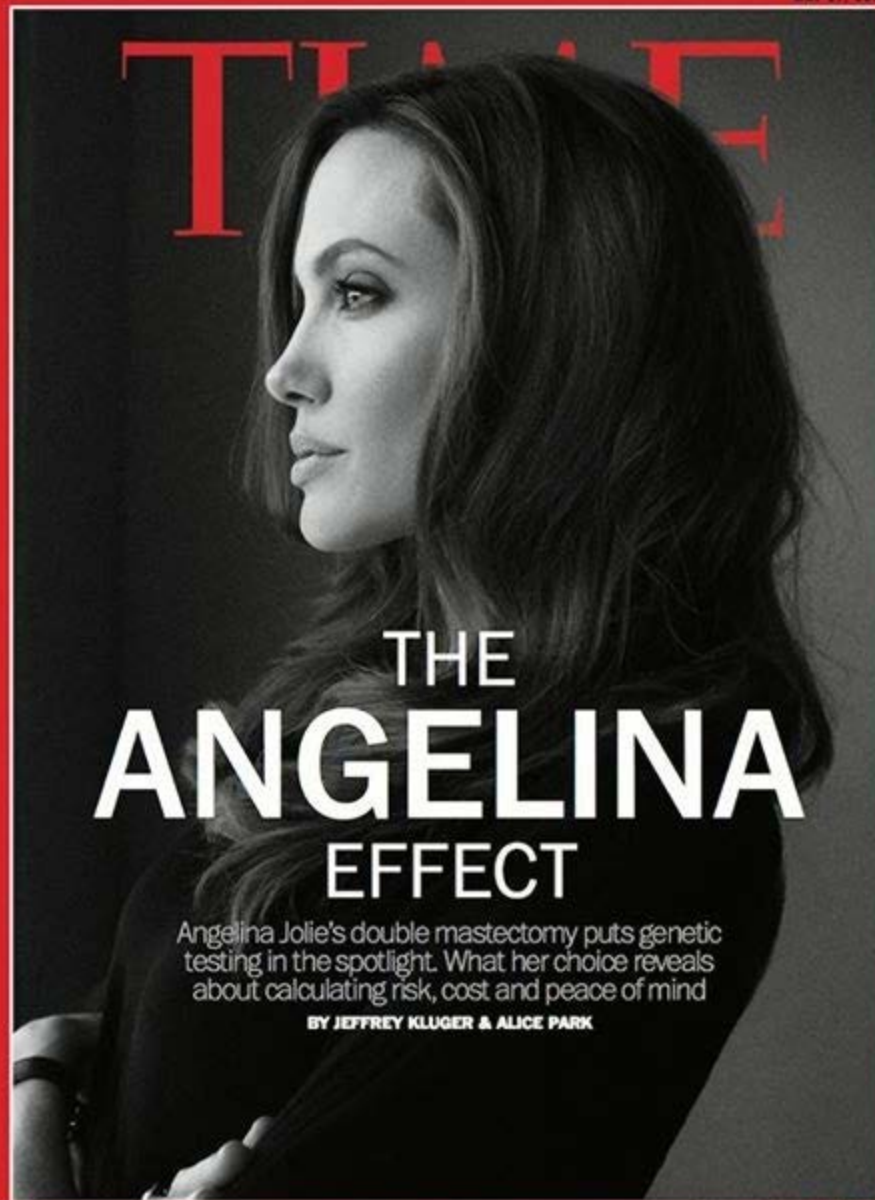


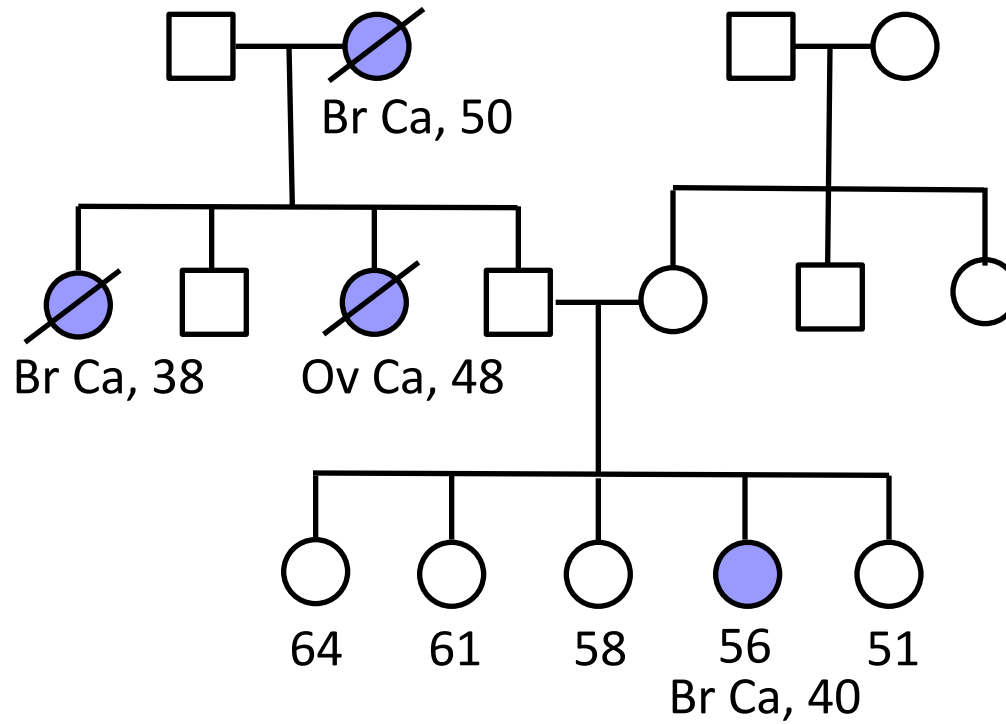
Don't forget to
look at both
sides of the
family!

Why would I want to know?

- My personal risk to get cancer (or another cancer)
- My children's risks to get cancer
- Other family members' risks to get cancer

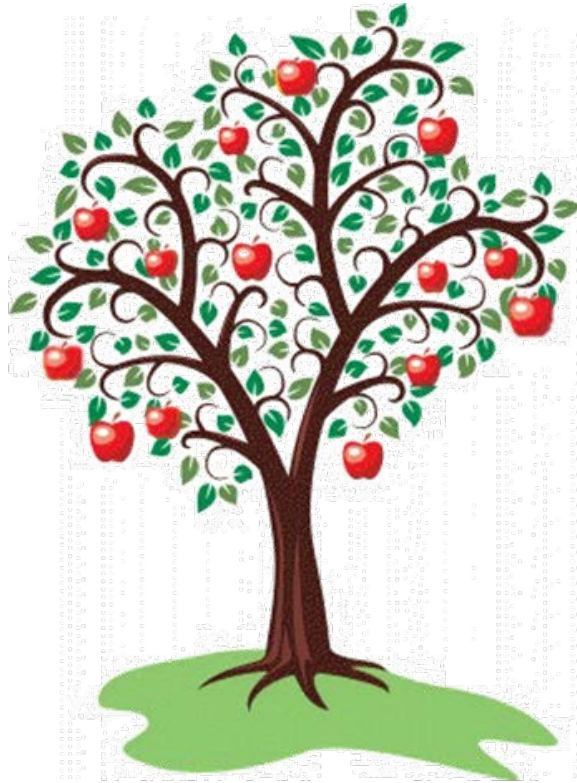
**Screening and prevention are often available
and may save a life**



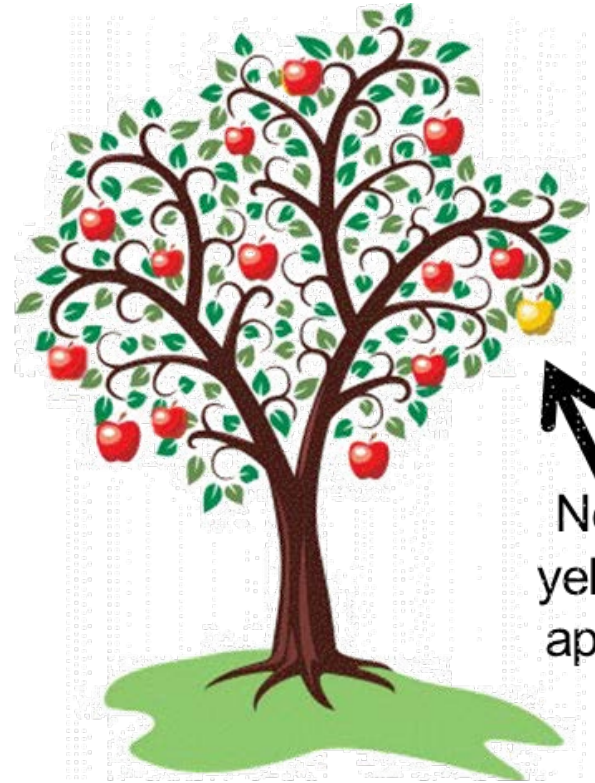


Family history of cancer?

Who is the best person to test?



Red apple tree growing red apples



New
yellow
apple

Red apple tree growing one yellow apple

Pearl of Wisdom #3

When searching for something rare,
start the search with the most likely
target.



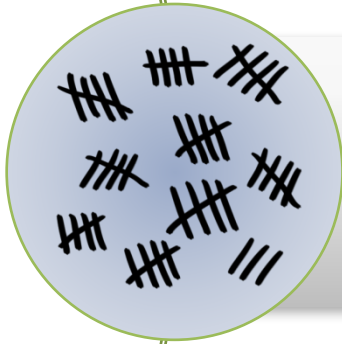
New Technology

Multi-Gene Panels

- Genetic tests to look at dozens of genes related to cancer
- Similar cost and turn around time as single gene testing
- Has benefits AND limitations!



Labs offering hereditary cancer genetic testing



Different multigene panels

>80

Number of genes available for testing

Many Genes = Too Much Information?

- Cancer risks may not be very high
 - How high does risk need to be before we pursue surgery or medications?
- Cancer risks may be unclear
 - How do we make medical decisions when we don't always know the risks?
- We're still learning
 - The recommendations you get today may be different in 5 years.

Hereditary Breast Cancer Tests

	<u>HBOC</u>	<u>BRCAPlus</u>	<u>BreastNext</u>	<u>CancerNext</u>
Actionable Genes Most Associated With Diagnosis:	BRCA1 BRCA2	BRCA1 BRCA2 PTEN P53 CDH1 STK11	BRCA1 BRCA2 PTEN P53 CDH1 STK11	BRCA1 BRCA2 PTEN P53 CDH1 STK11
More Rare Actionable Genes Associated with other Cancers:			MUTYH, NF1	MUTYH, APC BMPR1A, SMAD4 MLH1, MSH2 MSH6, PMS2, EPCAM, NF1
Low Penetrance Genes:			ATM, BARD1, BRIP1, CHEK2, MRE11A, NBN, PALB2, RAD50, RAD51C, RAD51D	ATM, BARD1, BRIP1, CDK4, CDKN2A, CHEK2, NBN, PALB2, RAD50, RAD51C, RAD51D

UW Cancer Genetic Testing Map

BROCA

ATM, ATR, BAP1, BARD1, BRIP1, CDK4, CDKN2A, CHEK1, CHEK2, FAM175A (Abraxas), FANCM, FH, FLCN, GEN1, HOXB13, MET, MITF, MRE11A, NBN, NF1, PALB2, PALLD, POT1, PRKAR1A, PRSS1, PTCH1, RAD51B, RAD51C, RAD51D, RB1, RECQL, RET, RINT1, SDHB, SDHC, SDHD, SLX4, SMARCA4, VHL, and XRCC2

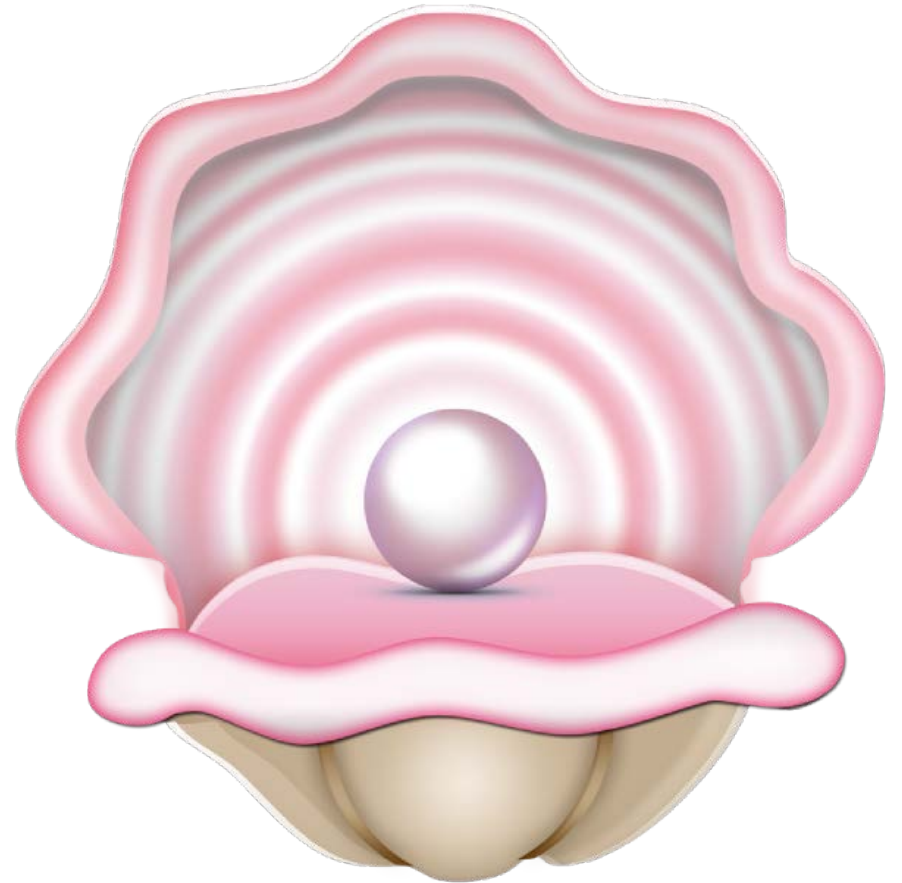
ColoSeq:
AKT1, APC, AXIN2, BMPR1A, CDH1, CTNNA1, EPCAM, GALNT12, GREM1, MLH1, MSH2, MSH6, MUTYH, NTHL1, PDGFRA, PIK3CA, PMS2, POLE, POLD1, PTEN, RPS20, SMAD4, STK11, and TP53

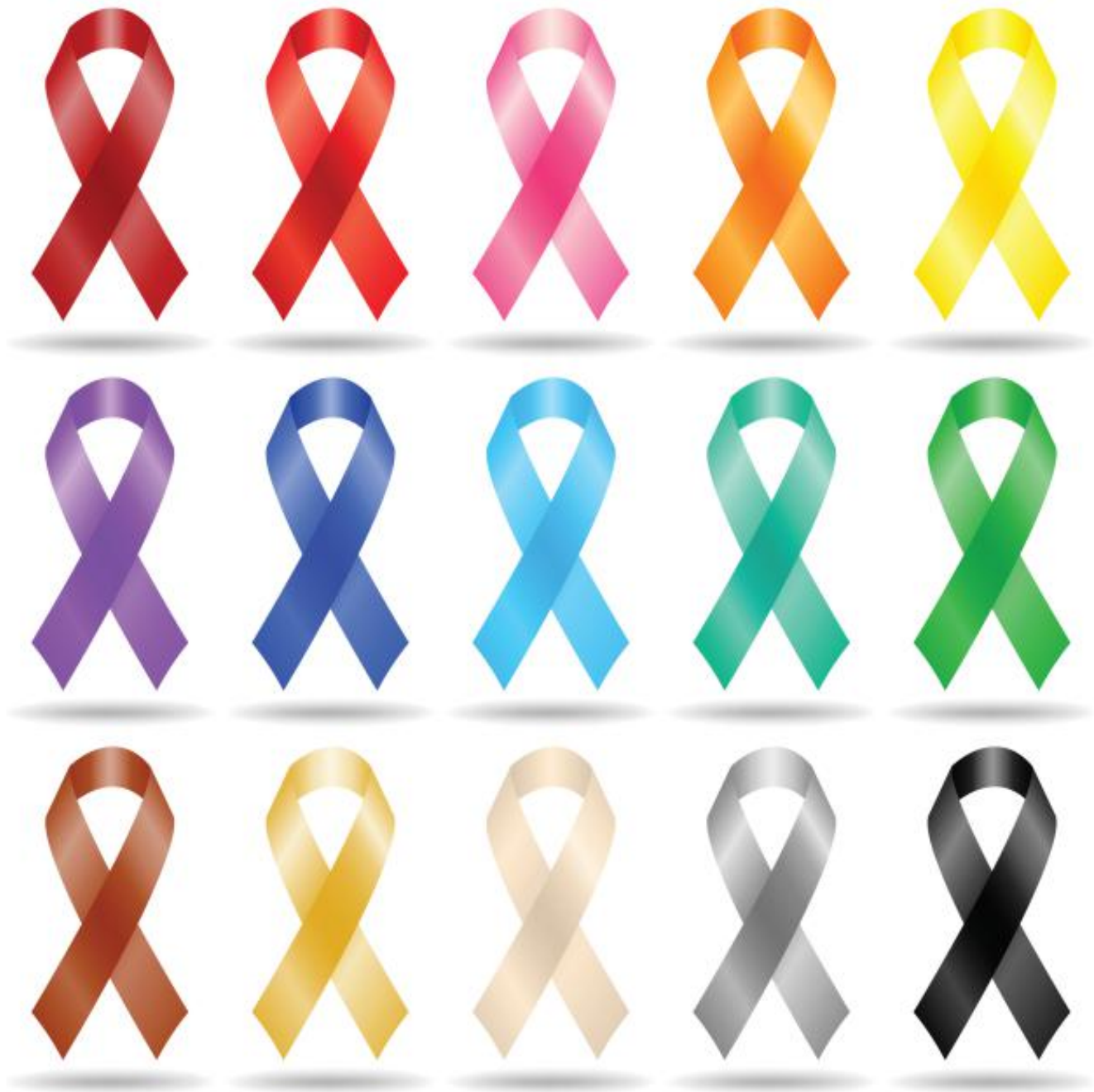
BRCA1/2

BRCA AJ

Pearl of Wisdom #4

Sometimes, in
our quest for
answers, we end
up with more
questions





What can you do?

- Know your family history
- Educate your family about its history
- Talk to your doctor or a genetic counselor

www.AboutGeneticCounselors.com

What can you do?



Ask questions!

WHAT IS A GENETIC COUNSELOR?

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Genetic Counselors

Personalized Care For Your Genetic Health



[Home](#) >> [FAQs + Resources](#) >> [Family History Resources](#)

Family History Resources

When you meet with a genetic counselor, it's important to bring all of the information you have about your [family health history](#), including any family members with health conditions, including intellectual disabilities, autism, [birth defects](#), cancer or other diseases.

A good way to start is to create a [family tree](#) that includes you, your brothers and sisters, your children and your parents. If possible, expand your family tree to include your nieces, nephews, aunts and uncles, grandparents and cousins.

Then you should try to gather information about your family's medical history, including:

- Age or date of birth, and cause of death for those who have died
- Medical problems any of them had and at what age (even approximately) they were affected, including:

Related Links



FIND A GENETIC COUNSELOR



GENETIC TESTING



WHAT IS A GENETIC COUNSELOR?

<http://www.aboutgeneticcounselors.com/FAQs-Resources/Family-History-Resources>

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