

CANCER AND GENETICS: IS CANCER A GENETIC DISEASE AND CAN TESTING HELP?

Presented by:

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WEBINAR HOUSEKEEPING

WELCOME

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All handouts and a copy of the presentation slides are available in the Handouts panel.

Please complete the survey that will be emailed out after the presentation

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Q&A

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Cancer and Genetics: Is Cancer a Genetic Disease and Can Testing Help?

Kim Brussow, MS, CGC
Certified Genetic Counselor
November 19, 2020



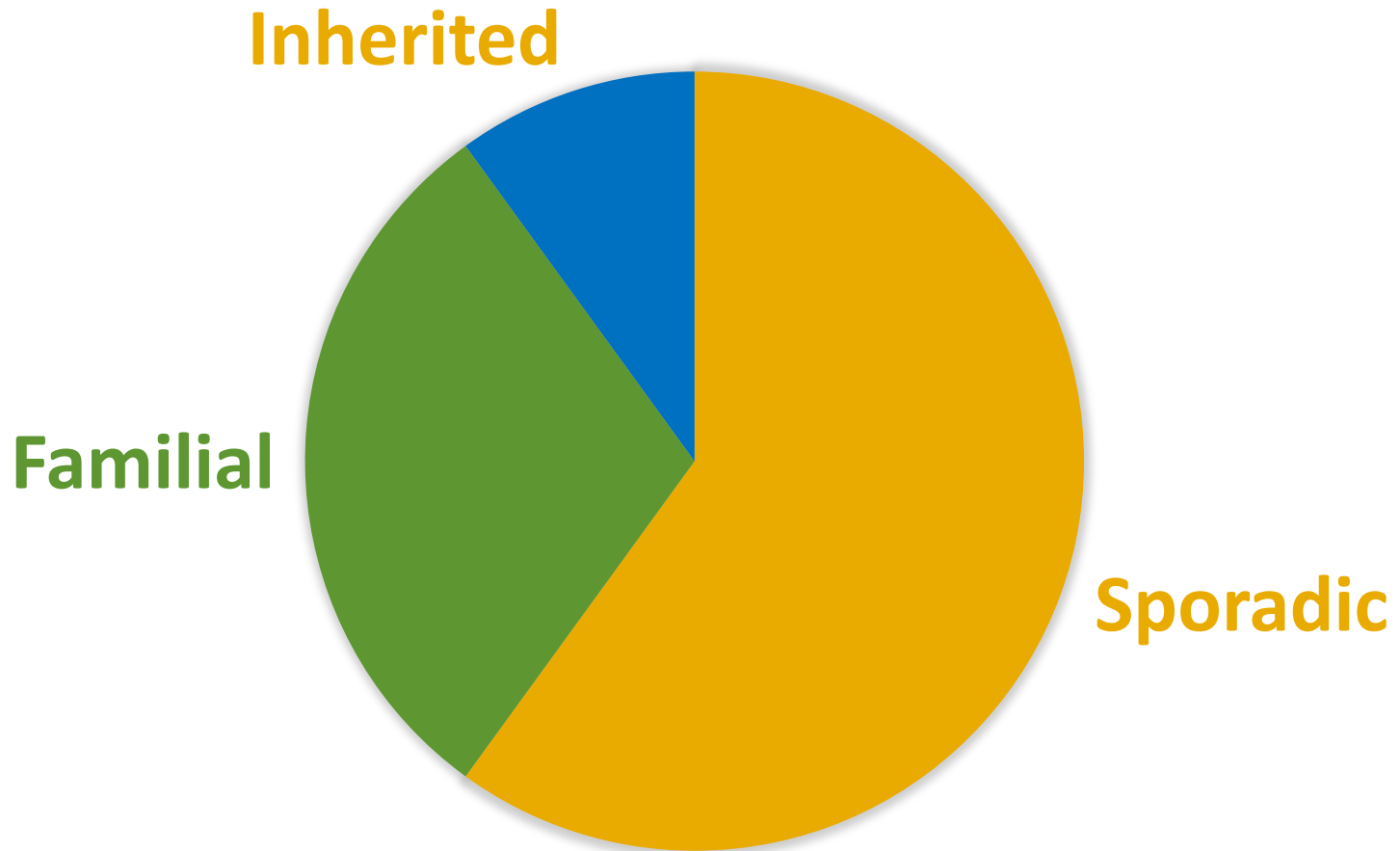
Objectives

- What is an inherited predisposition to cancer?
- What to expect from genetic counseling and testing?
- Who is appropriate for genetic counseling and testing?
- How might genetic testing alter cancer screenings or treatment?
- Discuss benefits and risks of genetic testing

Cancer Risk Factors



Cancer and Inheritance



What is an inherited predisposition to cancer?











- Increased risk to develop certain types of cancer due to a change (or mutation) in the genetic code
- Mutation can be passed on from either parent
- Can be passed on to either sons or daughters
- Types of cancers in family can provide clues



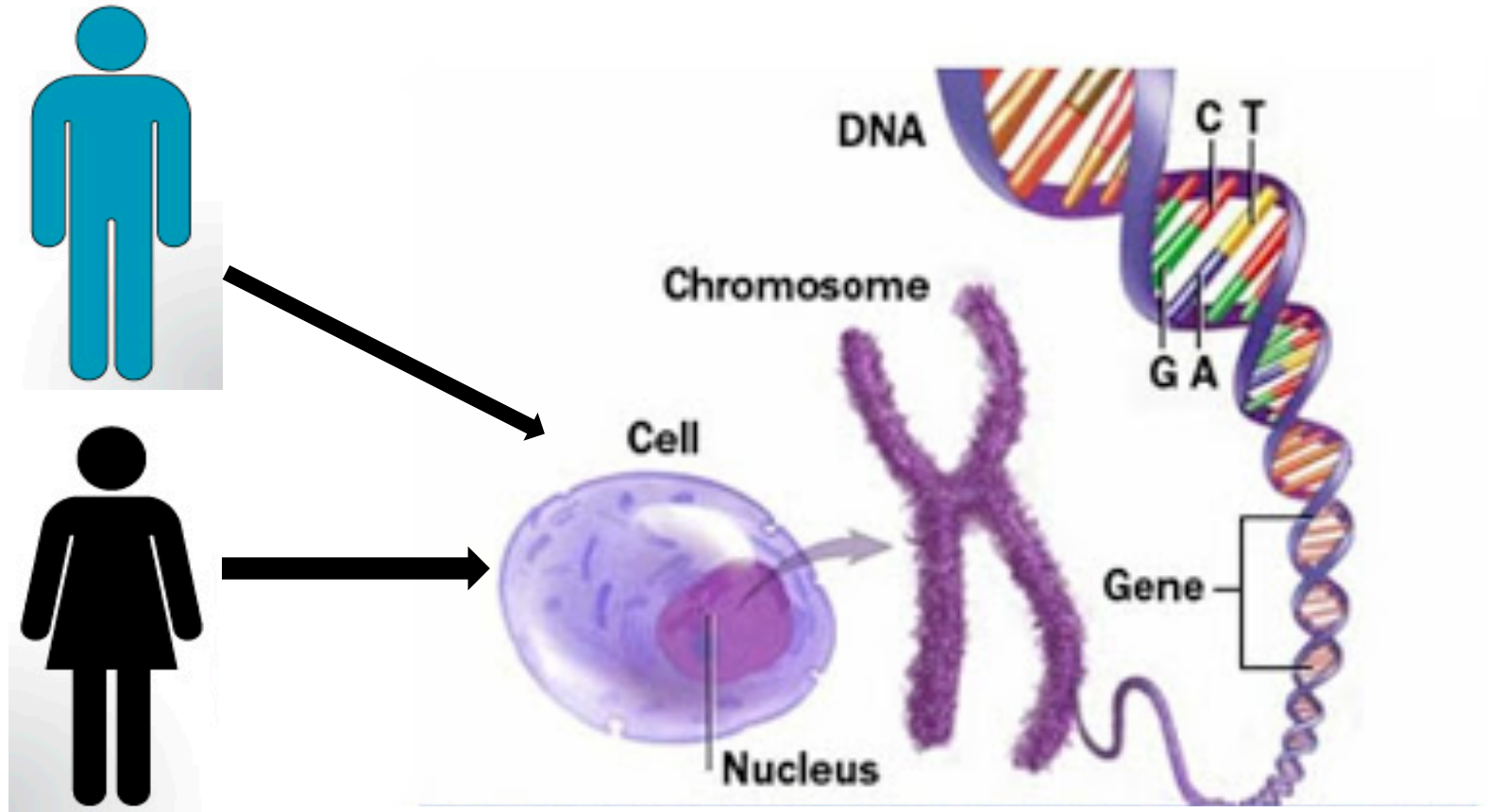
When to suspect an inherited predisposition to cancer

- Early age at diagnosis
- Multiple family members with the same type of cancer
- Multiple cancers in one individual
- Specific types of cancers clustering in family
- Ancestry
- Certain types of cancer:
 - Ovarian cancer
 - Triple negative breast cancer
 - Pancreatic cancer

Who should have genetic counseling/testing?

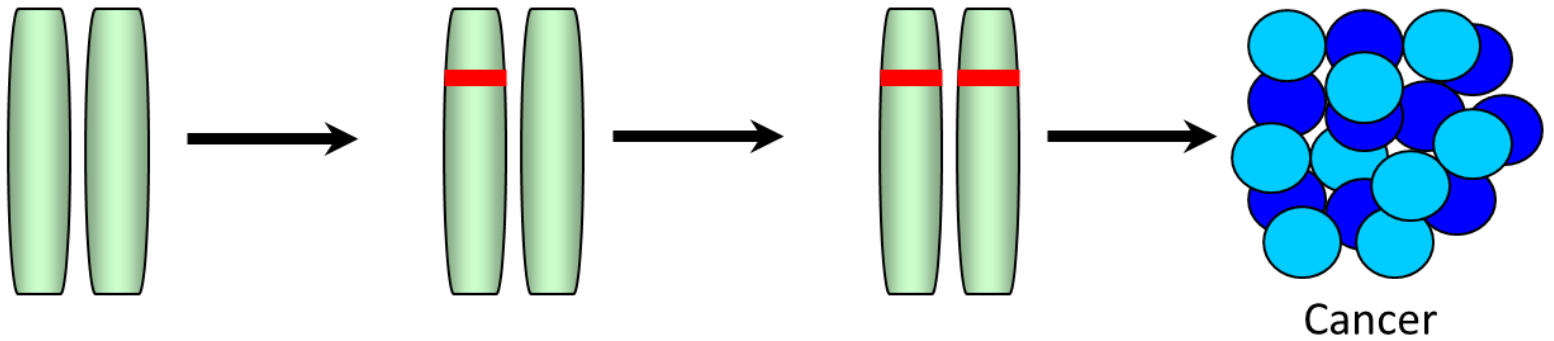
Individual with Cancer	Multiple Cases in the Family	OR (≤ 45/50 yr at diagnosis)	OR Diagnosis at Any Age
 Colorectal	✓	✓	
 Colon Polyps	✓		✓ 10 or More Polyps
 Breast	✓	✓	✓ Male Breast Cancer
 Ovarian	✓		✓
 Endometrial	✓	✓	
 Gastric	✓	✓	
 Pancreatic	✓	✓	✓
 Melanoma	✓	✓	
 Prostate	✓		✓ Metastatic
 Kidney	✓	✓	

Genetics 101

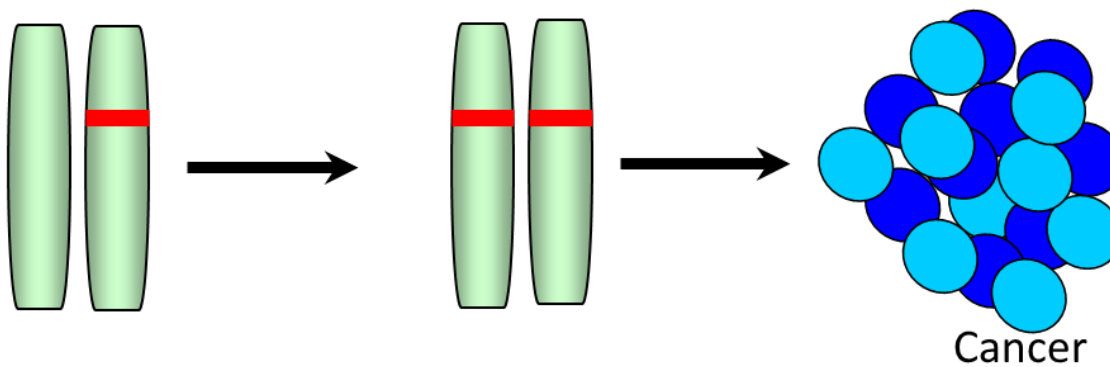


Cancer Development

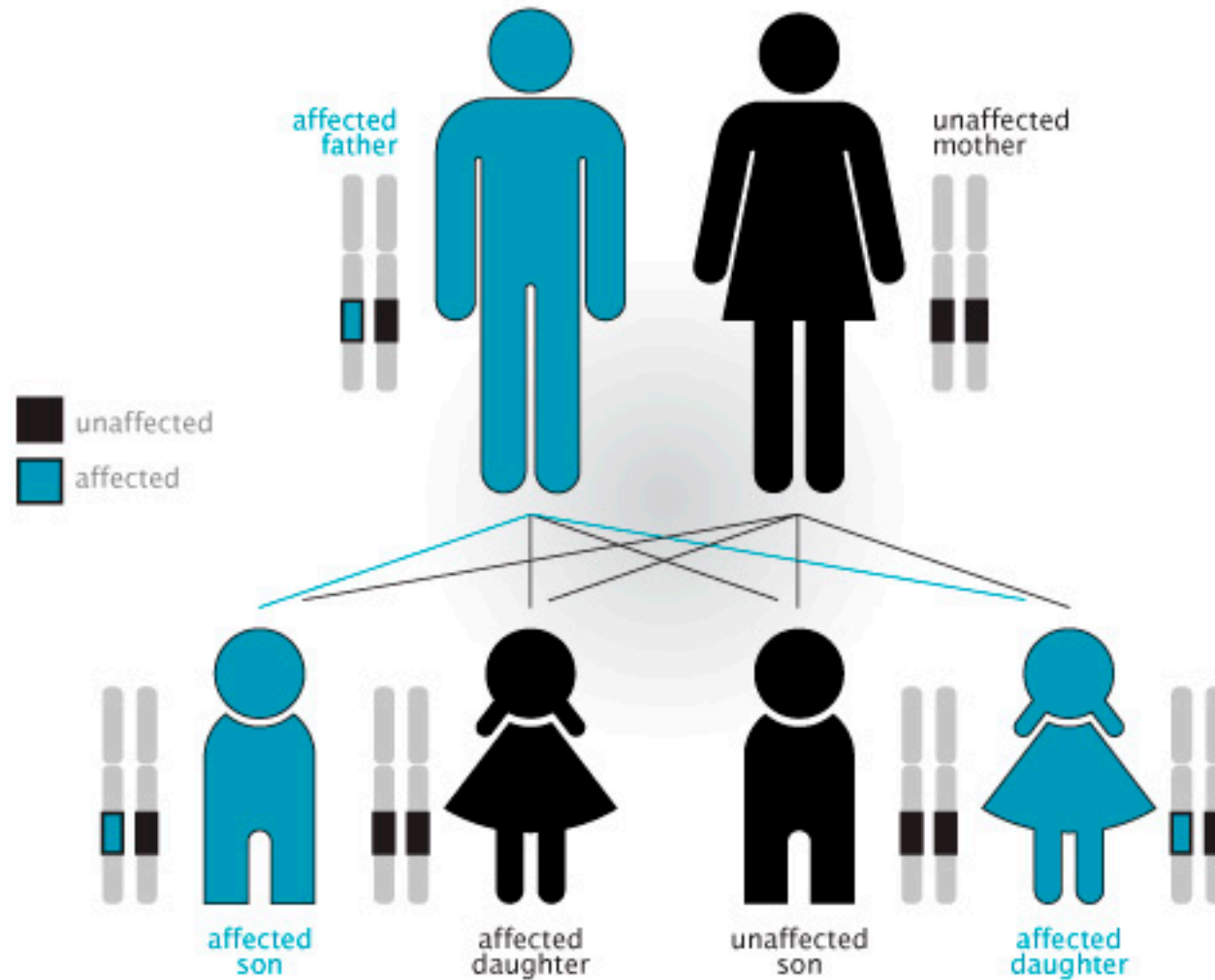
Sporadic Cancer



Hereditary Cancer



Autosomal Dominant Inheritance



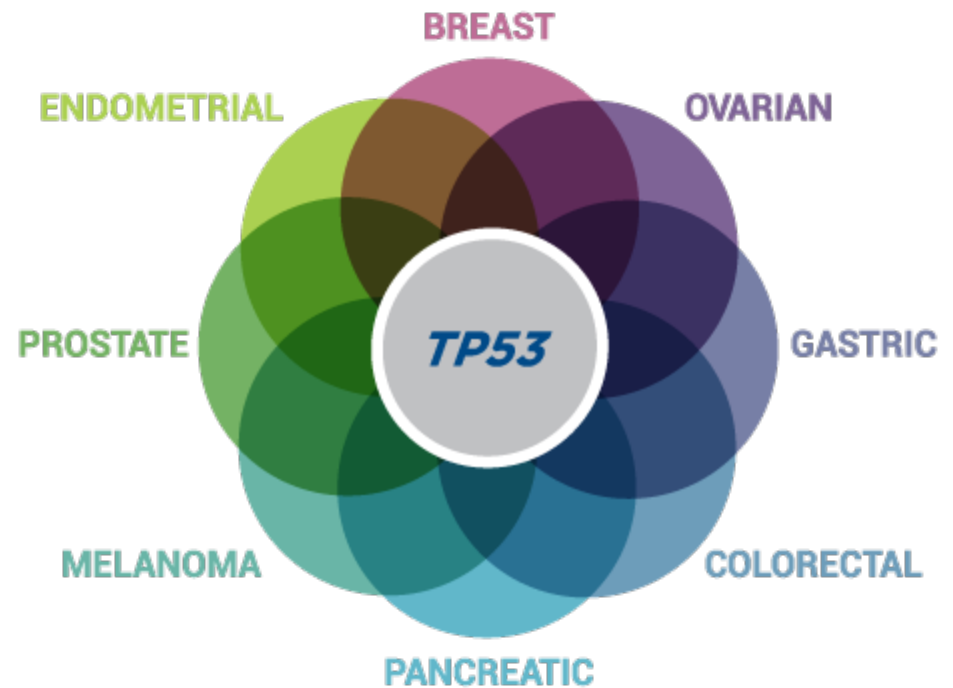
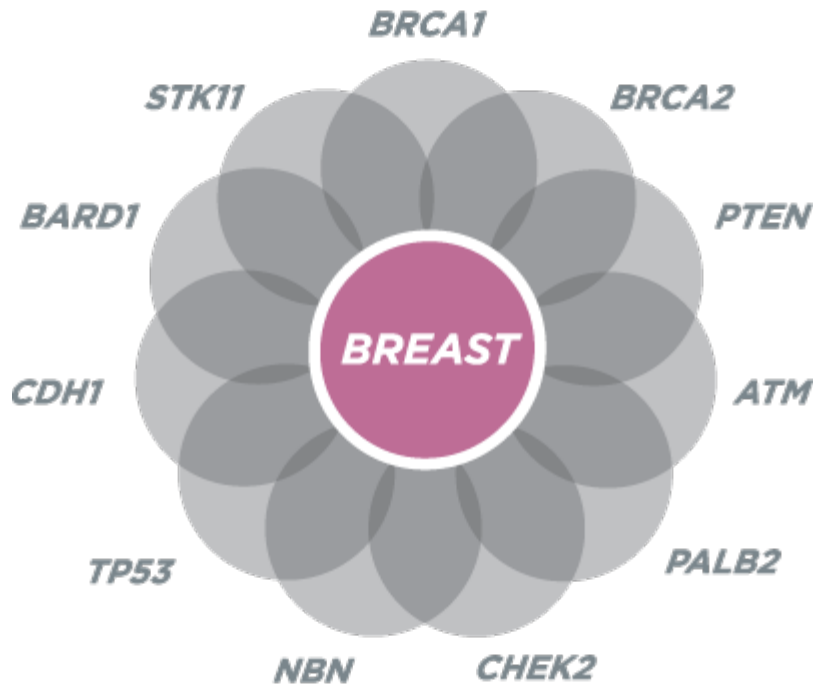
Possible Genetic Test Results

Positive

Negative

Variant of
Uncertain
Significance

Relationships of Genes and Types of Cancers



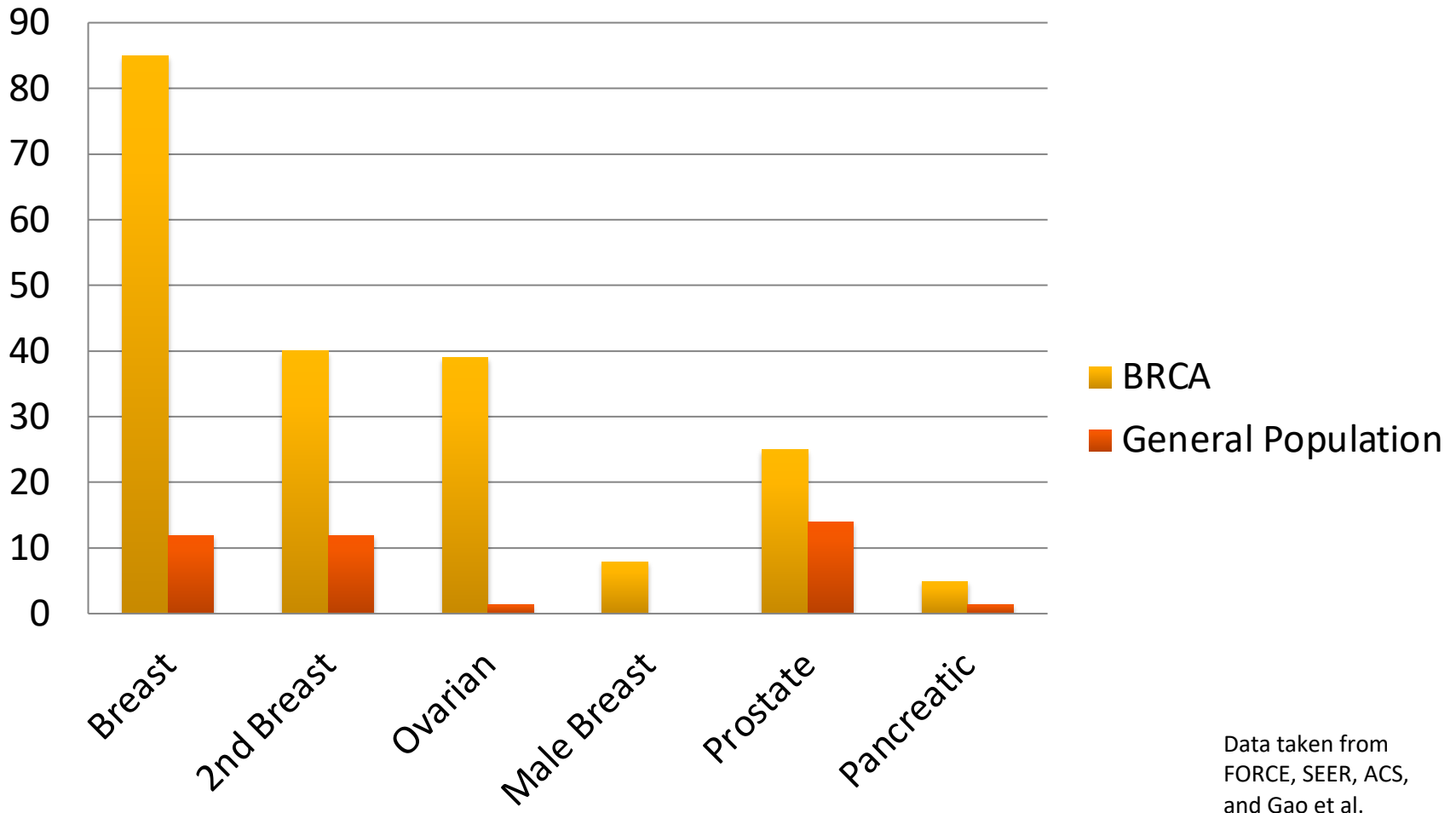
What to Expect with Pre-Test Genetic Counseling

- Collection of detailed, three-generation family history
- Evaluate and discuss patient's risk of developing cancer and/or risk of inherited predisposition to cancer
- Review possible genetic test results, limitations of genetic testing, implications of genetic test results for the patient and their family members
- Discuss insurance considerations/coverage
- Discuss risks, benefits and limitations of genetic testing with patient to help facilitate informed consent

What to Expect with Post-Test Genetic Counseling

- Reviewing significance and impact of the results to patient and family
- Test implications, including (as appropriate) management, risk reduction, screening options, prevention methods, lifestyle modifications, implications for relatives, referral to clinical trials and support services
- Emotional impact of results and referrals for those who need additional psychosocial support
- Dissemination plans, such as who should receive copies of results and how to discuss the results with relatives

Hereditary Breast and Ovarian Cancer Syndrome (HBOC) *BRCA1 & BRCA2*



Data taken from
FORCE, SEER, ACS,
and Gao et al.

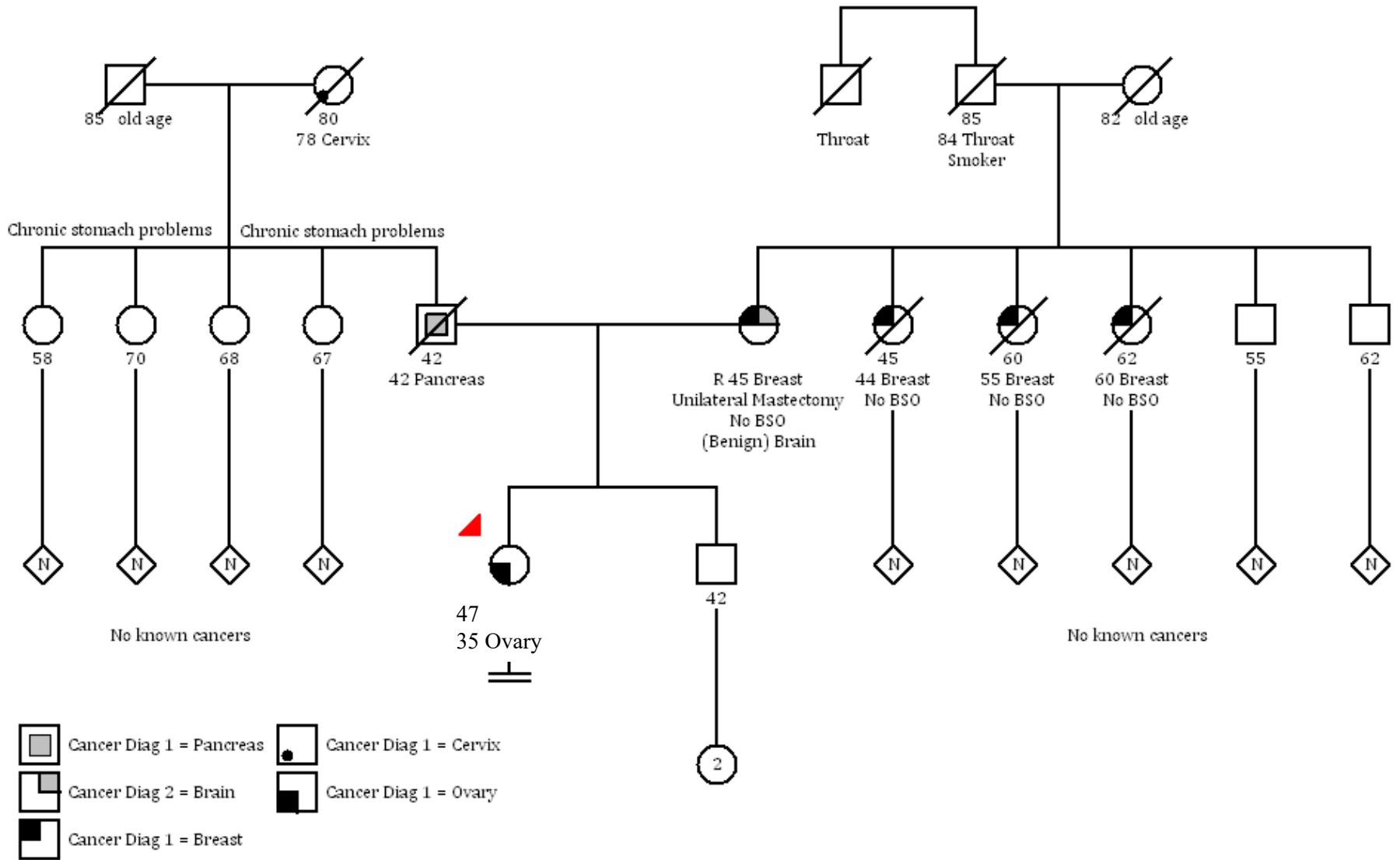
Case Example: Jane

- 47 year old female
- Considering breast reduction
- Breast surgeon noted:
 - Personal history of ovarian cancer, 35
 - Family history of breast cancer
- Prior to scheduling surgery, Jane sent for genetic counseling
 - Clarify risks to determine best surgery
 - Considering: reduction vs mastectomy



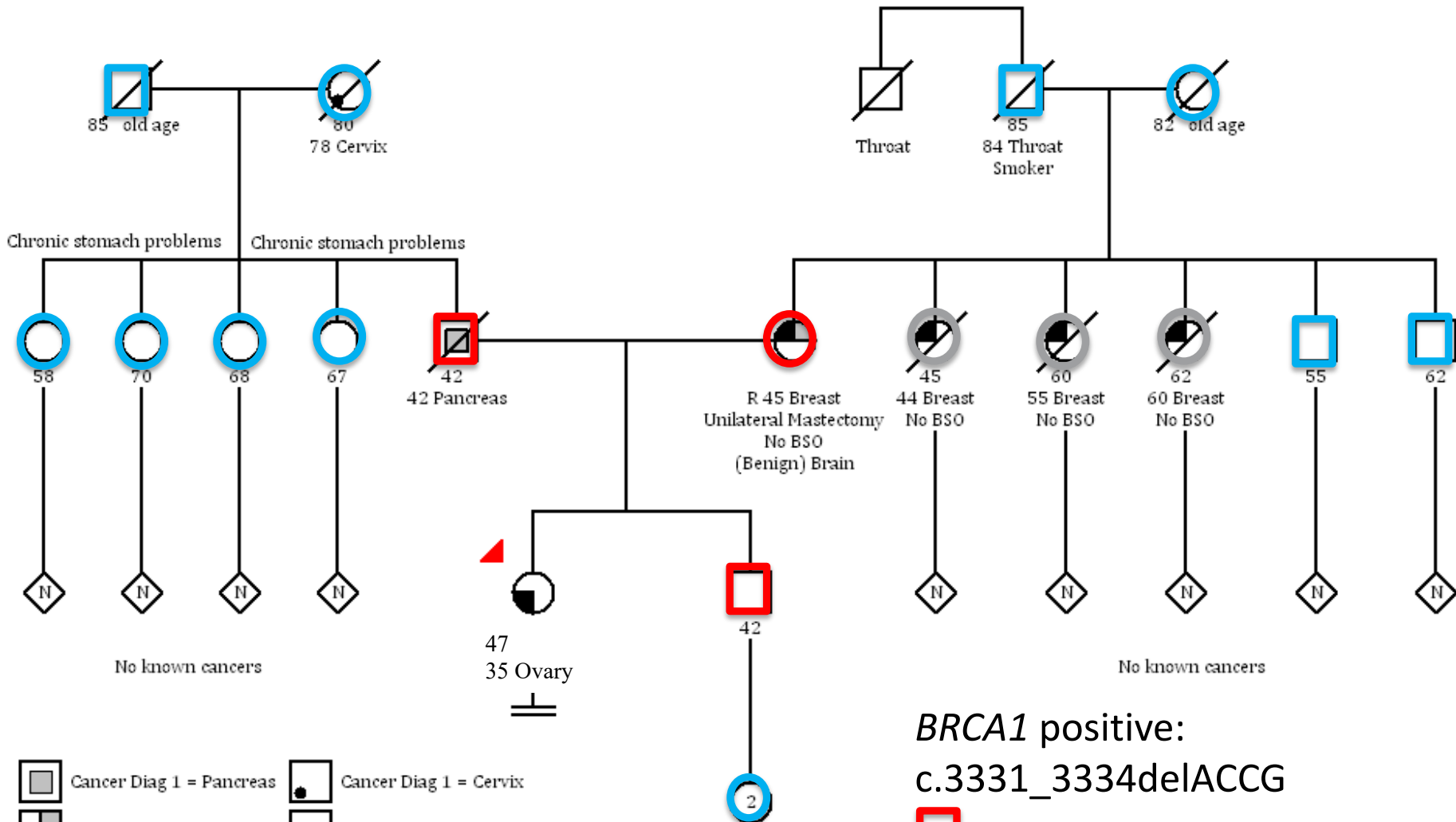
Colombia

Colombia



Colombia

Colombia



BRCA1 positive:
c.3331_3334delACCG

 First degree relative- 50% risk to carry mutation

 Second degree relative-25% risk to carry mutation

Case Example: Jane

- BRCA1 management can consist of:
 - Breast Cancer Management:
 - Annual mammograms and breast MRI beginning at 25
 - Consider a prophylactic mastectomy
 - Consider chemoprevention
 - Ovarian Cancer Management
 - Recommend ovary removal once child bearing complete
 - Pancreatic Cancer Management
 - Consider pancreatic cancer screening (specialized MRI)



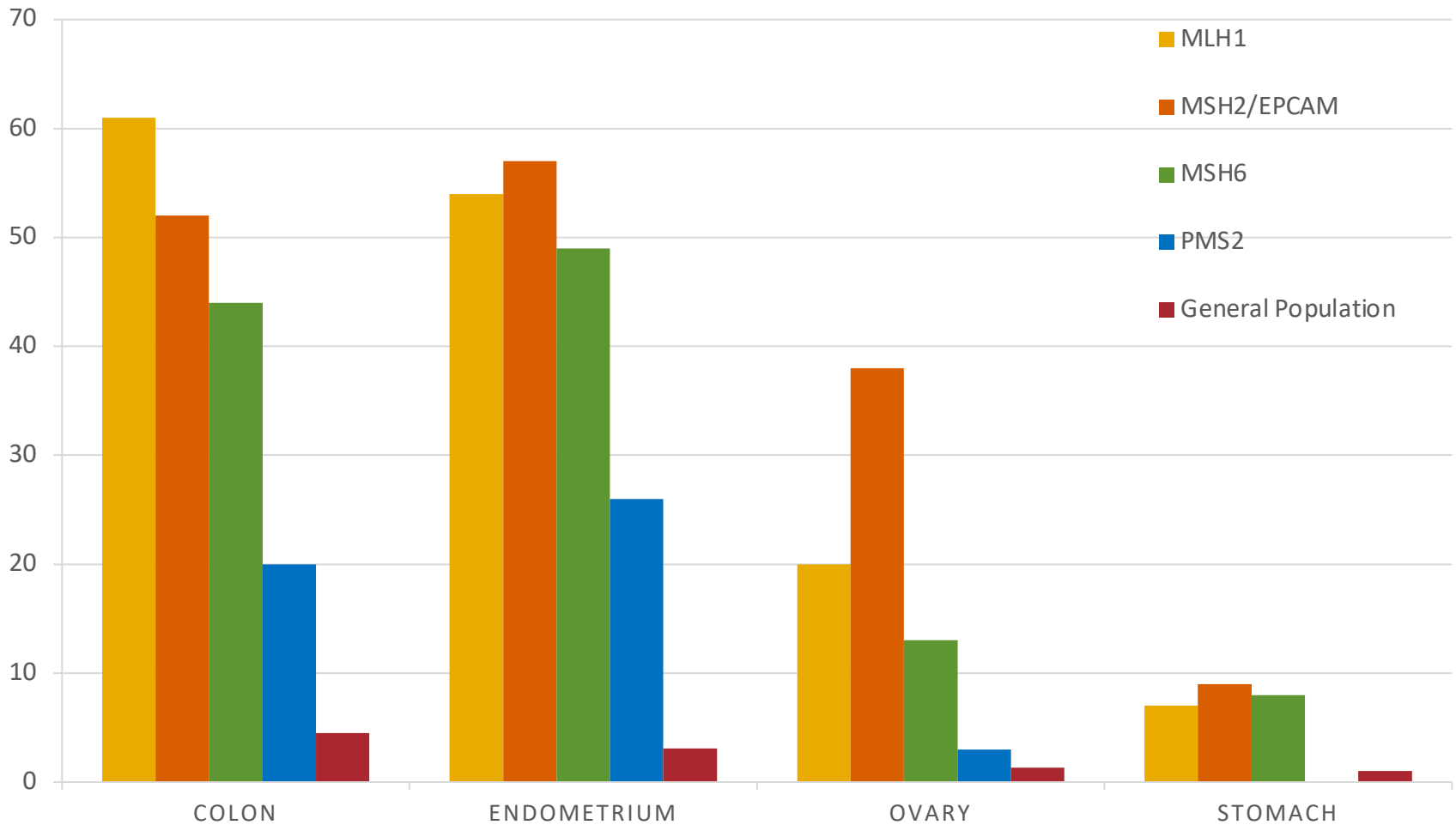
Advances in Genetic Testing

- Multi Gene Panels
 - ‘Clinically actionable’ vs “Kitchen Sink”
 - Longer discussion of risks, benefits and limitations
 - Higher rate of inconclusive results
 - What to do with the information?
 - Results may not influence medical management due to lack of available guidelines
- Can be especially useful if considering multiple predisposition syndromes
- More recently have become standard of care

Pros and Cons of Panel Genetic Testing

Benefits	Risks	Limitations
<ul style="list-style-type: none"> • More information 	<ul style="list-style-type: none"> • More information 	<ul style="list-style-type: none"> • Is testing indicated?
<ul style="list-style-type: none"> • May find out other cancer risks are increased 	<ul style="list-style-type: none"> • May not want to know about other cancer risks 	<ul style="list-style-type: none"> • Who is the best person to test?
<ul style="list-style-type: none"> • Benefit from increased screening 	<ul style="list-style-type: none"> • May not be interested in pursuing screening/surgery 	<ul style="list-style-type: none"> • New tests will become available in the future
<ul style="list-style-type: none"> • Consider risk reducing surgery 	<ul style="list-style-type: none"> • Results may cause stress, concern for family 	<ul style="list-style-type: none"> • For some genes, more information is needed about cancer risk
<ul style="list-style-type: none"> • Provide information for family 	<ul style="list-style-type: none"> • Family may not want to know 	<ul style="list-style-type: none"> • Uncertain results

Lynch Syndrome Cancer Risks

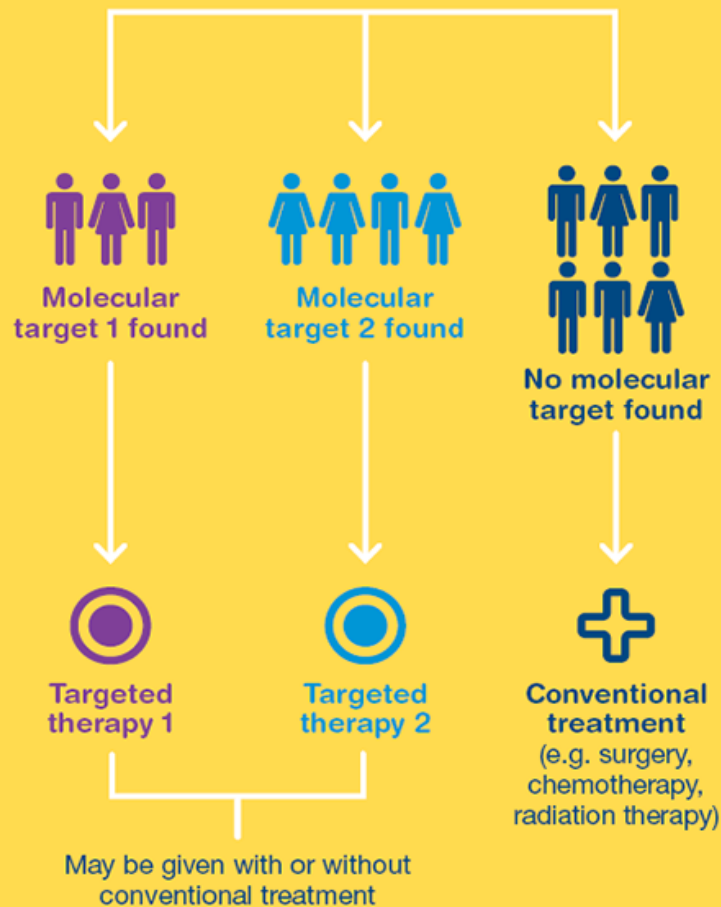


Somatic Genetic Testing to Guide Treatment

- Somatic mutations are changes that happen after a person is conceived
 - Not passed down to children
- Done after someone has been diagnosed with cancer
 - Information on an exact diagnosis
 - Information about the prognosis of the cancer
 - If treatments are available for cancer with that specific mutation
- *Sometimes*, this testing may detect a mutation in the tumor that is also inherited, resulting in additional genetic testing



People with the same type of cancer



GINA: Genetic Information Nondiscrimination Act of 2008

- **Title I: Prohibits genetic discrimination in health insurance.**
 - Makes it illegal for health insurance providers to use or require genetic information to make decisions about a person's insurance eligibility or
 - Went into effect on May 21, 2009.
- **Title II: Prohibits genetic discrimination in employment.**
 - Makes it illegal for employers to use a person's genetic information when making decisions about hiring, promotion, and several other terms of employment.
 - Went into effect on November 21, 2009.

Resources

- National Cancer Institute:
 - www.cancer.gov
- National Institute of Health: Genetics Home Reference
 - www.ghr.nlm.nih.gov/handbook/mutationsanddisorders/predisposition
- Genetic Information Nondiscrimination Act
 - www.ginahelp.org
- Facing Hereditary Cancer Empowered
 - www.facingourrisk.org/

Thank You!

For more information about cancer prevention,
treatment, screening, or to request a speaker for your
worksite on any cancer-related topic,
call: 602.699.3366





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A background image of a cityscape with mountains in the distance, overlaid with a semi-transparent blue filter.

CONTACT US



**THANK YOU
FOR WATCHING!**

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