
MD Anderson Cancer Center
Cooper
Making Cancer History®

Striving for Breast Health Equity

Generosa Grana, MD

Director, MD Anderson Cancer Center Cooper

Professor of Medicine, CMSRU

Impact of Race & Ethnicity on breast cancer incidence & mortality

The story is complex and issues far reaching

- Incidence is lower but mortality higher
- Differences in understanding of risk and genetic aspects of disease
- Screening issues
- Surgical and radiation issues
- Systemic therapy issues
- Even impact of Covid 19 on breast cancer was different in minority populations.

Tremendous advances in breast cancer worldwide

- Widespread use of mammography and focus on early detection
- Increased awareness of breast cancer risk & contributions of family hx and other risk factors to overall risk
- Surgical advances – moving from Halstead Radical Mastectomy to breast conservation
- Better understanding of the role of hormone therapy, chemotherapy and, most recently, immunotherapy
- Increasing use of survivorship issues

But

You will hear from Dr. Gittens, Yoon-Flannery, Dragun, Abou-Hussein and Robles how each of these areas have differentially impacted minority communities.

Today

- 6:15 PM – 6:35 PM Advances in Systemic Therapy: Are Outcomes Equal? Ahmed Kamel Abou Hussein, MD
- 6:35 PM – 6:55 PM Improving Access to Radiotherapy Services in Breast Cancer: How Far Have We Come? Anthony E. Dragun, MD
- 7:10 PM – 7:30 PM Disparities in Breast Imaging Allison F. Gittens, MD
- 7:30 PM – 7:50 PM Racial Disparities in the Surgical Management of Early Breast Cancer Kahyun Yoon-Flannery, DO, MPH
- 7:50 PM – 8:10 PM Updates on the Road to Breast Health Equity Evelyn Robles-Rodriguez, DNP, APN, AOCN

Breast Cancer Genetics- Example of differential impact on minority populations

History of BC Genetics

- Brca1/2 first identified in 1994/1995
  - Gradual uptake of genetic testing across the cancer community
- 2008 – GINA ACT – Genetic Information Nondiscrimination Act – passed into law.
- 2013 – US Supreme Court decision ruling that Myriad genetics patent on these human genes is invalid → opening the door for multiple other companies offering testing at markedly lower cost.
- 2013-2022 – increasing number of referrals to genetic counseling programs (self or by medical providers) for genetic testing & subsequent use of results to make decisions about management for patient and family
- Ongoing research into:
  - Continued study of hereditary families that remain uninformative
  - Understanding of gene / environment interactions
  - Understanding of significance of Variants of Uncertain Significance
  - Understanding of risk associated with mutation status and risk reduction strategies
  - Understanding barriers to dissemination of genetic testing across diverse populations

Utility of Genetic Testing for Cancer Treatment & Risk Management

- How can genetic testing results be used?
- Different uses for cancer patient vs. unaffected individual
  - Cancer treatment recommendations
  - Provide information for surgery decisions
  - Different, more frequent, or earlier cancer screenings
  - Provide basis for preventative medications
  - Identify other individuals in the family that may be at risk to develop a cancer

Genetic Testing Criteria

- Typically based on family history / number of affected family members and their age at diagnosis
- Current criteria much broader because of treatment implications for patient if mutation found

--metastatic prostate cancer

--high risk early stage prostate cancer

--all pancreas cancer

--all ovarian cancer

--? Metastatic breast cancer

--previously identified criteria –Ashkenazi jewish with no FH

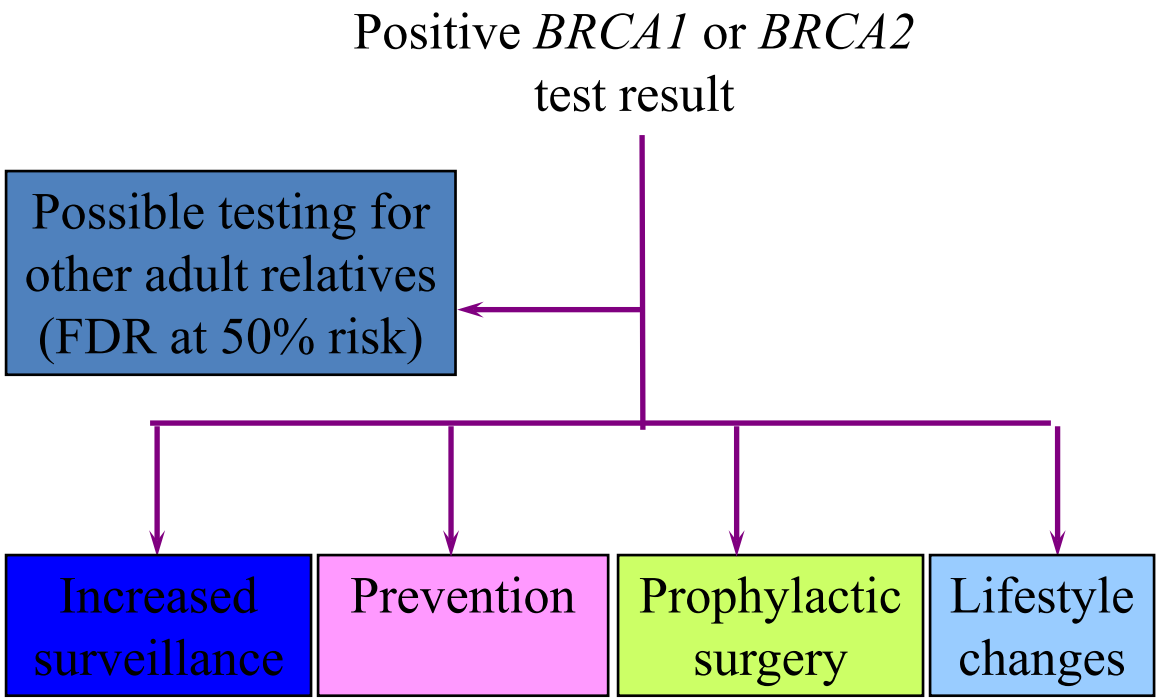
Genetic syndromes associated with BREAST & Ovarian cancer ---until 2013

Syndrome	Gene	% of cases of Hereditary breast cancer
HBOC	BRCA1 BRCA2	~50% 20-30%
CHEK2	CHEK2	4%
Ataxia Telangiectasia	ATM	??
Cowden syndrome	PTEN	1%
Li Fraumeni syndrome	TP53	1%

Evolving face of Gene Testing - & More still to Come

HEREDITARY BREAST CANCER GENES		
HIGH RISK	**MODERATE RISK**	**INCREASED RISK**
BRCA1	***ATM***	***BARD1***
BRCA2	***CHEK2***	***BRIP1***
CDH1	***PALB2***	***NBN***
PTEN		***RAD50***
STK11		***RAD51C***
TP53		***RAD51D***
		many others…
Lynch syndrome genes (*MLH1, MSH2, MSH6, PMS2, EPCAM*)		
****possible increased risk of breast cancer for carriers****		

Clinical Management of BRCA Mutation-Positive Patient



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Genetic testing in minority populations

- Disproportionately poor use of genetics
- Testing leads to identification of more Variants of Uncertain Significance, adding complexity to counseling and decision-making
- Many myths and misconceptions in minority communities.
- Much work needed to be done….

Black populations are underserved in hereditary cancer genetic testing

- Genetic testing is underutilized by the Black population
- Multiple barriers of receiving genetic counseling and testing have been identified in the literature
- The lack of sufficient diversity in genetic testing participation further perpetuates difficulties for Black people who do undergo hereditary cancer genetic testing

Lumpkins, CY, Philp, A, Nelson, KL, Miller, LM, Greiner, KA. A road map for the future: An exploration of attitudes, perceptions, and beliefs among African Americans to tailor health promotion of cancer-related genetic counseling and testing. *J Genet Couns*. 2020; 29: 518–529. https://doi.org/10.1002/jgc4.1277

Reported barriers to genetic counseling and testing access for minority populations

Lack of referrals

- It has been reported that Black women are less likely to be referred for genetic counseling and testing than white women

Cost

- The cost of genetic testing has significantly decreased in recent years however lack of insurance or the financial burden of a cancer diagnosis may also limit additional spending if clinical utility is not explained

Self-motivation

- If the utility of testing is not understood, people may be less likely to present for counseling or testing
- Some people are unaware that genetic testing is available for more than determining ancestry

Roberts, ME, Susswein, LR, Janice Cheng, W, et al. Ancestry-specific hereditary cancer panel yields: Moving toward more personalized risk assessment. *J Genet Couns*. 2020; 29: 598– 606. https://doi.org/10.1002/jgc4.1257
Saulsberry, K., & Terry, S. F. (2013). The need to build trust: a perspective on disparities in genetic testing. *Genetic testing and molecular biomarkers*, *17*(9), 647–648. https://doi.org/10.1089/gtmb.2013.1548

Reported barriers to genetic counseling and testing access for minority populations

Emotional impact of results

- Genetic testing results can prompt strong feelings such as fear, guilt, shame, anger
- Genetic testing results can impact the entire family and can cause conflicts between family members

Confidentiality/Discrimination concerns

- Worry for these results to impact their care
- Uninformed about Federal and State laws used to protect employment and health insurance coverage (GINA)

Mistrust of physicians and the medical system

- Patients may have experienced poor experiences with previous providers that have made them cautious in trusting their health care team
- Major events have occurred in the US's history of medical research that have had lasting effects on current peoples' views of the American health system

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Differences Amongst Minority Groups& Participation in Genetic Testing

- Importance of understanding barriers across various minority communities- and even amongst subgroups within those communities
  - Latina women- “compromises traditional female roles of prioritizing the family”
  - Asian women (Chinese, Korean, Filipino, South Asian origin)- “reluctant to hear about negative events in their own futures”
  - African American women- “lack of trust in the use of their genetic information”

Glen B, Chawla N, Bastani R (2012) Barriers to genetic testing for breast cancer risk among ethnic minority women:an exploratory study. Ethnicity Dis 22:267-273

BRCA1/2

- Germline mutations in the *BRCA1* and *BRCA2* genes are estimated to be found in about 1/400-800 within the general population
  - The likelihood of a familial pathogenic mutation significantly increases when there is a history of multiple women with breast cancer and even more so when there is a family history of breast and ovarian cancers
  - Estimated risks to carry a pathogenic mutation after a breast cancer diagnosis can vary by ethnicity

	BRCA1	***BRCA2***
Ashkenazi Jewish	8.3-10.2%	2.1%
Non-AJ White	2.2%-2.9%	
Asian American	0.5%	
African American	1.3%-1.4%	2.6%
Hispanic	3.5%	

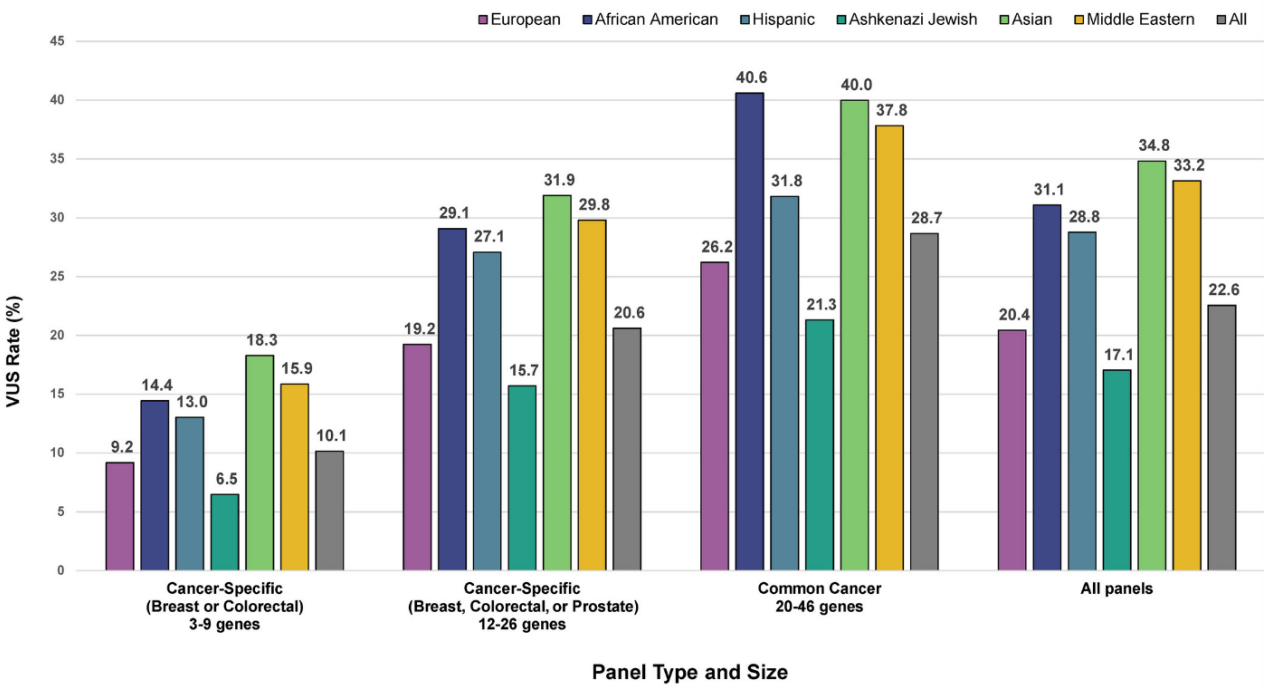
PDQ® Cancer Genetics Editorial Board. PDQ Genetics of Breast and Gynecologic Cancers. Bethesda, MD: National Cancer Institute. Updated <MM/DD/YYYY>. Available at: https://www.cancer.gov/types/breast/hp/breast-ovarian-genetics-pdq. Accessed <MM/DD/YYYY>. [PMID: 26389210]

Variants of Uncertain Significance (VUS)

- Variant of Uncertain Significance
  - A result that is neither positive nor negative
  - Laboratory is unsure if this specific variant would predispose to or cause a health condition
  - Over time laboratories collect more data on these variants and reclassify them
- Due to the lack of genetic data on non-European or Ashkenazi Jewish ethnicities, minority populations are more likely to have a reported VUS after having panel testing
- These results are typically treated as negatives until laboratories reclassify them

Roberts, ME, Susswein, LR, Janice Cheng, W, et al. Ancestry-Specific hereditary cancer panel yields: Moving toward more personalized risk assessment. *Genet Couns*. 2019; 28:58-164. https://doi.org/10.1002/jgc4.1257

VUS rates among hereditary cancer multi-gene panels



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Triple Negative Breast Cancer (TNBC)

- Triple Negative Breast Cancer(TNBC)
  - ER: Negative, PR: Negative, Her2: Negative
- TNBC is more common in Black women than in White women
- TNBC diagnosed ≤60yo with or without a family history meets NCCN criteria for genetic testing
- There is a West African founder mutation in *BRCA1* (c.943ins10)
- A study by Rummel *et. al* (2013) a higher percent of *BRCA1* mutations was found in TNBC of Black women than White women

Richardson LC, Henley J, Miller J, Massetti G, Thomas CC. Patterns and trends in black-white differences in breast cancer incidence and mortality—United States, 1999–2013. *MMWR* 2016;65(40):1093–1098.
Rummel, S., Varner, E., Shriver, C.D. *et al.* Evaluation of BRCA1 mutations in an unselected patient population with triple-negative breast cancer. *Breast Cancer Res Treat* **137,** 119–125 (2013). https://doi.org/10.1007/s10549-012-2348-2
Ricks-Santi, L., McDonald, J. T., Gold, B., Dean, M., Thompson, N., Abbas, M., Wilson, B., Kanaan, Y., Naab, T. J., & Dunston, G. (2017). Next Generation Sequencing Reveals High Prevalence of BRCA1 and BRCA2 Variants of Unknown Significance in Early-Onset Breast Cancer in African American Women. *Ethnicity & disease*, *27*(2), 169–178. https://doi.org/10.18865/ed.27.2.169

To End on a positive note-
Examples of Strategies to Increase Minority Participation in Genetic Testing & Research

- Distributing specialized literature to minority groups (Anton-Culver et al, 2003)
- Community based partnerships (Saulsberry et al, 2013)
- Community-engaged & community-driven health promotion programs (Campbell et al, 2007; Corbie-Smith et al 2015; Israel et al 2010)
- Use of Faith-based organizations (Lumpkins et al 2019)

In Conclusion

- Genetic testing is a critical element in the management of breast cancer
- Major changes in the area of genetics have greatly impacted the management of this disease
- But ---- not all populations have reaped these benefits--- Minority populations have not benefitted equally from this evolving filed.
- Many barriers exist to explain this
- Work is ongoing to address them…..