Germline Genetic Testing Access and Survival Outcomes in Male Breast Cancer: A Veterans Affairs Cohort Analysis

Chunyang Li[1], Vikas Patil[1], Richard McShinsky[2], Zach Burningham[2], Akiko Chiba[3], Sita Bushan[4], Shruti Trehan [5], Michael J. Kelley[6], Ahmad Halwani[7], Sarah V Colonna[7]

[1] Epidemiology, University of Utah / George E Wahlen VA, Salt Lake City, UT | [2] Medical Oncology, University of Utah / George E Wahlen VA, Salt Lake City, UT [3] Surgical Oncology, Duke University / Durham VAMC / National Oncology Program, VA, Durham, NC | [4] Medical Oncology, Baylor University / Michael E DeBakey VA / National Oncology Program, VA, Houston, TX | [5] Medical Oncology, Tampa VA / National Oncology Program, VA, Tampa, FL | [6] Medical Oncology, Duke University / Durham VAMC / National Oncology Program, VA, Durham, NC [7] Medical Oncology, Huntsman Cancer Institute / George E Wahlen VA / National Oncology Program, VA, Salt Lake City, UT.

Background

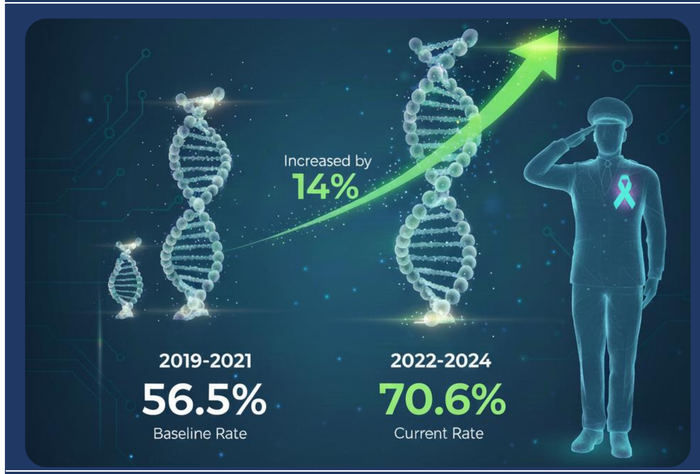
- Male breast cancer (MBC) accounts for ~1% of breast cancers, with ~2,800 new US cases in 2025.
- MBC has a higher germline mutation frequency than female breast cancer, mostly the result of a higher frequency of BRCA2 mutations in males (10-15%) compared to females (5-10%) .
- NCCN guidelines and VA clinical pathways recommend genetic testing for all men with breast cancer given high mutation frequency and treatment implications.
- However, real-world data on genetic testing rates and survival outcomes for veterans with MBC is limited. This population offers a key opportunity to assess testing use, guideline adherence, and long-term survival, which could lead to better clinical care protocols for all.

Methods

- Veterans with MBC (2019-2025) were identified using VA Cancer Registry (site code C50).
- Patients receiving VA care were defined as having ≥2 visits with oncology services.
- Clinical notes were analyzed using natural language processing and large language model (Llama 3.3 70B) to extract germline genetic testing (GGT) access.
- GGT access proportion was compared for year 2019-2021 vs. 2022-2024.
- Overall survival (OS) analysis was conducted and outcomes by GGT access were compared.

Disease Characteristics and Survival Curve

Characteristics		MBC Veterans DXed after 2019 (523)	Veterans with Access to Testing (334)	Veterans without Access to Testing (189)	P-value
Age at Diagnosis	(mean, range)	71.88, (33 - 102)	70.61, (33 - 92)	74.14, (46 - 90)	
	<45	3(0.57%)	3(0.9%)	0(0.0%)	0.48
	>=45	520(99.43%)	331(99.1%)	189(100.0%)	0.48
Race	White	317(60.61%)	197(58.98%)	120(63.49%)	0.73
	Black	146(27.92%)	96(28.74%)	50(26.46%)	0.73
	Hispanic	23(4.4%)	15(4.49%)	8(4.23%)	0.73
	Others	37(7.07%)	26(7.78%)	11(5.82%)	0.73
Rurality	Urban	391(74.76%)	251(75.15%)	140(74.07%)	0.82
	Rural	131(25.05%)	82(24.55%)	49(25.93%)	0.82
	None	1(0.19%)	1(0.3%)	0 (0%)	0.82
EP/PR/HER2	ER/PR positive	520(99.43%)	332(99.4%)	188(99.47%)	0.92
	HER2 positive	46(8.8%)	28(8.38%)	18(9.52%)	0.92
	TNBC	3(0.57%)	2(0.6%)	1(0.53%)	0.92



Germline Genetic Testing Rate Increased by 14%

Contact

Ahmad Halwani, MD; VA National Oncology Program; George E Wahlen SLC VA; Assistant Professor of Medicine; Ahmad.halwani@va.gov;

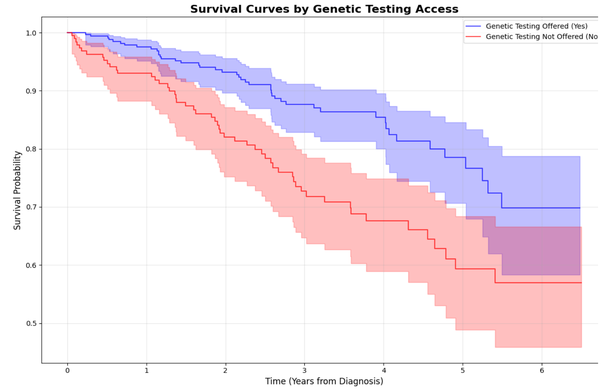
Catherine Li, PhD; University of Utah; George E Wahlen SLC VA; Research Assistant Professor; catherine.li@utah.edu

Vikas Patil, MS; University of Utah; George E Wahlen SLC VA; Sr. Data Scientist; Vikas.patil@va.gov;

Sarah Colonna, MD; Medical Director BGSOE; George E Wahlen SLC VA; Associate Professor (Clinical); Sarah.Colonna@hci.utah.edu;

Results

- 523 Veterans with male breast cancer were diagnosed after 2019. Mean age was 72 years; 61% were White, 28% were Black and 4% were Hispanic. 75% lived in urban areas. 520 (99.43%) were ER/PR+, 46 (8.8%) HER2+, and 3 (0.57%) triple-negative.
- **334 (63.9%) had access to germline genetic testing over the course of their disease; with access rates increasing by 14% from 56.5% (134/237) in 2019-2021 to 70.6% (192/272) in 2022-2024 ($p < 0.001$, χ^2 test)**



Five-year OS was 70.9% overall, with significant difference by GGT access (78.6% vs. 59.3%, p<0.001).

Conclusion

- Male Veterans with Breast Cancer are increasingly able to access germline genetic testing with a majority having access to GGT in the last three years.
- GGT access is associated with improved overall survival on univariate analysis.