

Supplemental online content for:

Nationwide Trends and Determinants of Germline *BRCA1/2* Testing in Patients With Breast and Ovarian Cancer

Kelsey S. Lau-Min, MD, MSCE; Anne Marie McCarthy, PhD; Katherine L. Nathanson, MD; and Susan M. Domchek, MD

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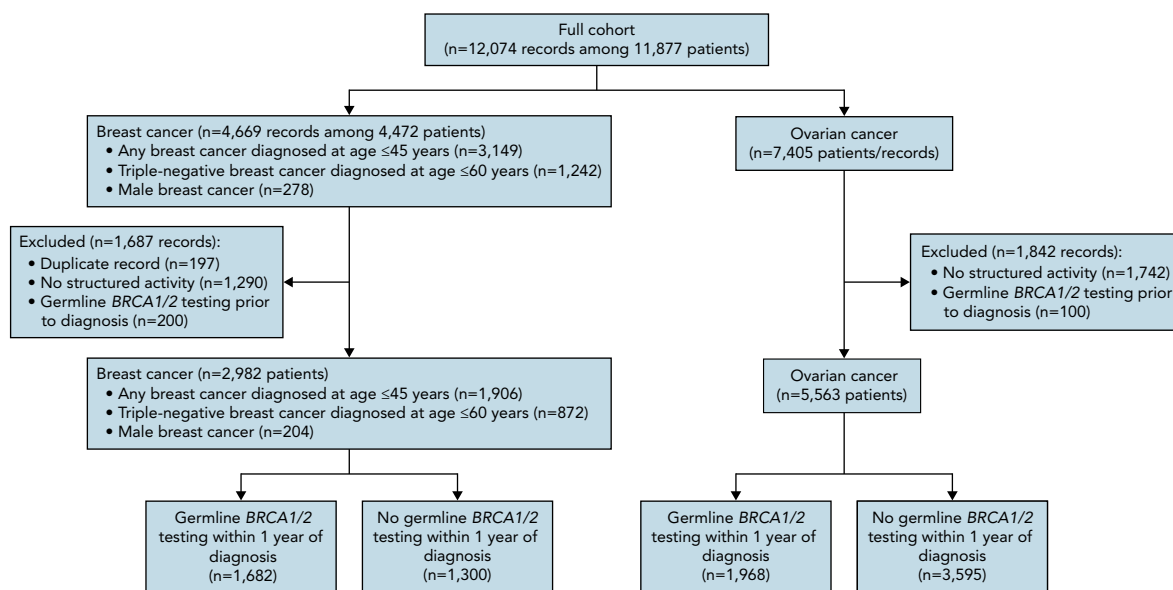
eFigure 1: Patient Flow Diagram for Patients With Breast and Ovarian Cancer

eFigure 2: Association Between Germline *BRCA1/2* Testing and Age, Estimated Using Spline Regressions Among Patients With Breast Cancer and Ovarian Cancer

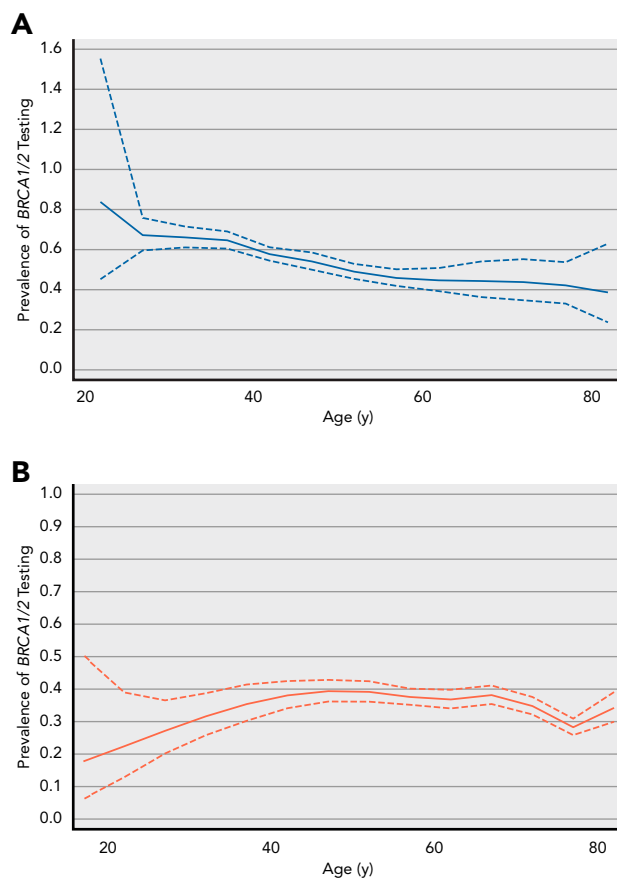
eTable 1: Baseline Characteristics of the Primary and Multiply Imputed Datasets

eTable 2: Primary Multivariable and Sensitivity Analyses of Determinants of Germline *BRCA1/2* Testing Within 1 Year of Diagnosis Among Patients With Breast Cancer

eTable 3: Primary Multivariable and Sensitivity Analyses of Determinants of Germline *BRCA1/2* Testing Within 1 Year of Diagnosis Among Patients With Ovarian Cancer



eFigure 1. Patient flow diagram for patients with breast and ovarian cancer. Patients with no structured electronic health record activity within 90 days after their diagnosis date were excluded from the analysis.



eFigure 2. Association between germline BRCA1/2 testing and age, estimated using spline regressions among patients with **(A)** breast cancer (n=2,982) and **(B)** ovarian cancer (n=5,563). Germline BRCA1/2 testing was defined as occurring within 1 year of diagnosis. Dashed lines indicate 95% confidence intervals.

eTable 1. Baseline Characteristics of the Primary and Multiply Imputed Datasets				
Characteristic	Breast Cancer		Ovarian Cancer	
	Nonimputed Dataset	Multiply Imputed Datasets	Nonimputed Dataset	Multiply Imputed Datasets
Cancer stage				
I	11.6%	11.8%	20.8%	20.5%
II	29.9%	29.8%	9.3%	9.3%
III	26.0%	25.9%	45.3%	45.4%
IV	32.5%	32.6%	24.5%	24.8%
Race				
White	60.1%	59.9%	78.0%	77.8%
Black or African American	20.4%	20.4%	6.4%	6.4%
Asian	3.5%	3.5%	2.6%	2.6%
Other race ^a	16.0%	16.2%	12.9%	13.2%
Insurance status				
Commercial health plan	63.9%	63.9%	59.0%	59.6%
Medicare	5.0%	5.0%	23.5%	22.1%
Medicaid, other govt program, or PAP	9.0%	9.1%	4.3%	4.5%
Other ^b	22.1%	22.0%	13.2%	13.7%
Charlson comorbidity score				
0	97.1%	96.4%	92.5%	92.4%
≥1	2.9%	3.6%	7.5%	7.6%

Abbreviations: gvt, government; PAP, patient assistance program.

^aIncludes American Indian or Alaska Native, Hawaiian or Pacific Islander, and race descriptions that fall in multiple race categories.

^bIncludes self-pay, workers compensation, and known insurance coverage of unknown type.

eTable 2. Primary Multivariable and Sensitivity Analyses of Determinants of Germline *BRCA1/2* Testing Within 1 Year of Diagnosis Among Patients With Breast Cancer

	Primary Model (n=2,982) RR (95% CI)	Post-PARPi Approval (n=592) RR (95% CI)	Community Practices (n=2,709) RR (95% CI)	Alive at 1 Year (n=2,747) RR (95% CI)	Nonimputed Dataset (n=1,359) RR (95% CI)
Diagnosis year	1.08 (1.05–1.11)	1.01 (0.87–1.18)	1.07 (1.04–1.10)	1.07 (1.04–1.10)	1.09 (1.04–1.14)
Diagnosed post-PARPi approval ^a (ref: no)					
Yes	0.98 (0.83–1.16)	—	0.99 (0.83–1.18)	1.00 (0.84–1.19)	0.88 (0.70–1.10)
Triple-negative breast cancer (ref: no)					
Yes	0.98 (0.86–1.11)	1.12 (0.87–1.43)	0.97 (0.86–1.11)	1.02 (0.90–1.16)	1.01 (0.85–1.19)
Cancer stage at diagnosis (ref: stage I)					
II	0.97 (0.82–1.14)	0.97 (0.70–1.35)	0.98 (0.82–1.17)	0.96 (0.81–1.14)	0.99 (0.79–1.25)
III	0.95 (0.79–1.13)	0.91 (0.65–1.28)	0.96 (0.80–1.16)	0.96 (0.80–1.14)	0.96 (0.76–1.22)
IV	0.76 (0.64–0.90)	0.76 (0.56–1.04)	0.78 (0.65–0.93)	0.79 (0.67–0.94)	0.83 (0.66–1.05)
Age ^b	0.93 (0.90–0.96)	0.93 (0.87–1.00)	0.93 (0.90–0.97)	0.93 (0.90–0.96)	0.92 (0.88–0.97)
Sex (ref: female)					
Male	1.19 (0.89–1.58)	1.36 (0.78–2.39)	1.22 (0.91–1.64)	1.18 (0.88–1.59)	1.17 (0.78–1.76)
Race (ref: White)					
Black or African American	0.95 (0.83–1.08)	1.08 (0.84–1.39)	0.92 (0.80–1.06)	0.94 (0.81–1.08)	0.91 (0.75–1.09)
Asian	0.86 (0.64–1.15)	0.66 (0.33–1.33)	0.85 (0.63–1.14)	0.87 (0.65–1.17)	0.80 (0.54–1.18)
Other race ^c	0.89 (0.77–1.03)	0.87 (0.65–1.17)	0.85 (0.73–0.99)	0.89 (0.76–1.03)	0.90 (0.73–1.10)
Insurance (ref: commercial health plan)					
Medicare	0.69 (0.49–0.96)	0.64 (0.34–1.23)	0.64 (0.44–0.93)	0.71 (0.50–1.01)	0.68 (0.46–1.02)
Medicaid, other govt program, or PAP	0.89 (0.72–1.09)	0.91 (0.60–1.36)	0.90 (0.72–1.12)	0.90 (0.73–1.11)	0.86 (0.67–1.11)
Other ^d	0.99 (0.86–1.13)	0.97 (0.76–1.24)	1.01 (0.87–1.17)	1.00 (0.87–1.15)	1.05 (0.88–1.24)

Adjusted RRs were estimated using multivariable log-binomial regressions using the multiply imputed datasets and in sensitivity analyses limiting to the post-PARP inhibitor approval period, restricting to community oncology practices, limiting to patients who remained alive 1 year after diagnosis, and using the nonimputed dataset. Generalized estimating equations were used to account for clustering by practice site.

Abbreviations: govt, government; RR, relative risk; PAP, patient assistance program; PARPi, PARP inhibitors; pt, patient.

^aPARPi were approved for *BRCA1/2*-mutated metastatic breast cancer on January 12, 2018.

^bReported in 5-year increments.

^cIncludes American Indian or Alaska Native, Hawaiian or Pacific Islander, and race descriptions that fall in multiple race categories.

^dIncludes self-pay, workers compensation, and known insurance coverage of unknown type.

eTable 3. Primary Multivariable and Sensitivity Analyses of Determinants of Germline <i>BRCA1/2</i> Testing Within 1 Year of Diagnosis Among Patients With Ovarian Cancer					
	Primary Model (n=5,563) RR (95% CI)	Post-PARPi Approval (n=3,423) RR (95% CI)	Community Practices (n=4,747) RR (95% CI)	Alive at 1 Year (n=4,880) RR (95% CI)	Nonimputed Dataset (n=3,103) RR (95% CI)
Diagnosis year	1.11 (1.07–1.14)	1.09 (1.05–1.12)	1.10 (1.07–1.14)	1.11 (1.07–1.14)	1.10 (1.06–1.15)
Diagnosed post-PARPi approval ^a (ref: no)					
Yes	1.42 (1.19–1.70)	—	1.43 (1.18–1.73)	1.41 (1.17–1.68)	1.38 (1.10–1.73)
Cancer stage at diagnosis (ref: I)					
II	1.42 (1.18–1.70)	1.44 (1.18–1.76)	1.33 (1.09–1.63)	1.39 (1.16–1.67)	1.46 (1.16–1.83)
III	1.51 (1.32–1.73)	1.50 (1.29–1.75)	1.44 (1.25–1.66)	1.55 (1.36–1.77)	1.56 (1.32–1.85)
IV	1.28 (1.10–1.48)	1.36 (1.15–1.61)	1.20 (1.02–1.40)	1.37 (1.18–1.60)	1.39 (1.15–1.69)
Age ^b	0.95 (0.93–0.97)	0.96 (0.94–0.98)	0.95 (0.93–0.97)	0.96 (0.94–0.98)	0.95 (0.93–0.97)
Race (ref: White)					
Black or African American	0.80 (0.65–0.98)	0.79 (0.63–0.99)	0.84 (0.68–1.03)	0.80 (0.65–0.98)	0.86 (0.66–1.11)
Asian	1.00 (0.75–1.34)	1.10 (0.80–1.51)	1.01 (0.74–1.37)	0.98 (0.73–1.32)	1.05 (0.71–1.55)
Other race ^c	0.91 (0.79–1.04)	0.93 (0.80–1.09)	0.91 (0.79–1.06)	0.90 (0.78–1.05)	0.93 (0.77–1.11)
Insurance (ref: commercial health plan)					
Medicare	0.91 (0.80–1.04)	0.92 (0.79–1.06)	0.93 (0.81–1.07)	0.93 (0.81–1.06)	0.93 (0.80–1.08)
Medicaid, other govt program, or PAP	0.83 (0.64–1.07)	0.89 (0.68–1.15)	0.86 (0.65–1.13)	0.83 (0.64–1.09)	0.80 (0.60–1.08)
Other ^d	0.81 (0.69–0.95)	0.81 (0.68–0.97)	0.79 (0.66–0.94)	0.82 (0.69–0.96)	0.82 (0.68–0.98)

Adjusted RRs were estimated using log-binomial regressions using the multiply imputed datasets and in sensitivity analyses limiting to the post-PARP inhibitor approval period, restricting to community oncology practices, limiting to patients who remained alive 1 year after diagnosis, and using the nonimputed dataset. Generalized estimating equations were used to account for clustering by practice site.

Abbreviations: govt, government; PAP, patient assistance program; PARPi, PARP inhibitors; RR, relative risk.

^aPARPi were approved for *BRCA1/2*-mutated chemotherapy-refractory ovarian cancer on January 12, 2018.

^bReported in 5-year increments.

^cIncludes American Indian or Alaska Native, Hawaiian or Pacific Islander, and race descriptions that fall in multiple race categories.

^dIncludes self-pay, workers compensation, and known insurance coverage of unknown type.