Singing River Health System

Addressing health disparities with cancer risk assessment to improve outcomes

In 2020, Singing River Health System was the first in south Mississippi to establish a cancer risk assessment program with the goal to identify patients at high risk for breast cancer and those with hereditary genetic mutations. Identifying women who meet criteria for genetic testing or supplemental imaging had the potential to improve women's health in a state which often ranks low in health outcomes and health literacy.

Every patient who has a screening mammogram at one of Singing River's four breast centers—13,000 annually—has their cancer risk calculated using the Tyrer-Cuzick v8 (TC8) risk model or NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) in Volpara® Risk Pathways™ software.

In two years, 25% of screening patients met the NCCN Guidelines® for genetic testing and approximately 36% complied, completing the genetic test onsite at Singing River. Results found 114 patients (6%) to have pathogenic mutations (73) or carrier status (41). Eight hundred and thirteen patients (42%) received negative genetic results but were found to still be at elevated cancer risk—based on personal or family history—and were directed to new surveillance recommendations.

Singing River Pascagoula Hospital, Pascagoula, MS

Singing River Health System

Location: South Mississippi

Risk assessment program established: 2020

High Risk Clinic established: 2020

24-month results:

25%
Met NCCN Guidelines

36%
Completed the genetic test

6%
Have pathogenic mutations or carrier status

42%
Have negative results but still at high risk

Additionally, 6% of screening patients qualified for high-risk breast MRI with TC8, of which 36% completed the exam. This resulted in earlier identification and treatment of seven breast cancers and risk counseling for over 1,800 patients—who are now empowered with knowledge and personalized care recommendations to be proactive with their breast health.

This was the case for a 67-year-old patient who had had negative mammograms for the past six years but for whom genetic testing at the time of her most recent mammogram revealed a *BRCA1* mutation. The patient chose to receive a bilateral mastectomy and the pathology report of her breast tissue found a well-differentiated 2 mm IDC with some background ADH in one breast, and low-grade DCIS with background ADH in the other breast.

For another 50-year-old patient, genetic testing returned negative results for any gene mutations, but high-risk breast MRI revealed an atypical lobular hyperplasia—she also chose to receive a bilateral mastectomy with reconstruction.

> "Every patient is offered a breast cancer risk assessment at the time of their mammogram. Once our patients have been identified as high risk, we offer early interventions. This can include additional imaging and screenings, risk reduction counseling, and surgical interventions by our multidisciplinary team. Personalized risk management and care plans allow patients to make informed decisions which improves patient outcomes. With all this, we can complete the circle of care while keeping patients close to home."
>
> —Tami Hudson, RN, BSN, BHCN, Breast Health Navigator, Radiology

A population with health concerns

Singing River's mammography screening population has high minority, lower-income representation.

One of the demographics most at risk for breast cancer and breast cancer-related deaths is Black women.[1]

According to the American Cancer Society, Black women are 39% more likely to die from breast cancer than white women.

Compliance concerns, literacy levels, and incomes have led to lower compliance.

Much of Singing River's at-risk population is vulnerable and ideal candidates for a high-risk program.

Filling the gaps in care

The pressing health needs of their patient population and an increase in outside referrals to other institutions for care ignited Singing River's interest in a comprehensive cancer risk assessment program becoming part of their routine mammogram service. If they could keep these high-risk patients closer to home, they could increase the odds of patient compliance with care recommendations and improve outcomes.

It was essential to have multidisciplinary participation and a shared understanding that the program would provide better prevention, close the circle of care, and potentially add revenue. A tenacious nurse navigator, lead mammographer, and radiologist joined forces to champion and evangelize the program. A Singing River employee story—her mother had breast cancer three times before she developed breast cancer herself and learned she was BRCA positive—helped reinforce the "why" in a very personal way.

Once the program was approved, determining the care pathways the health system would support came next. Singing River committed to offering patients breast MRI, contrast enhanced mammography (CEM), ultrasound onsite genetic testing, and high-risk counseling.

With a commitment to multidisciplinary partnership, Singing River selected Volpara Risk Pathways software to power their risk assessment workflow. Risk Pathways is deeply integrated with the health's system's Epic® electronic health record (EHR), which greatly reduces duplicate data entry, makes assessment possible in each patient encounter, and keeps collaborative decision-making in the EHR. Every care team member has the same view of the patient's risk and recommendations for appropriate interventions, ranging from additional imaging, genetic testing, and risk-reducing medications to lifestyle changes. More than just a score, Risk Pathways offers models, care guidelines, and content to help coordinate care for patients at elevated risk.

Singing River began providing risk assessments in just one breast center before expanding to two more centers within the first year. Adding nurse navigator roles was also central to the program's early success. Having a multidisciplinary team available in-house to partner with their patients and walk them through all the recommended care encouraged adherence.

The increased revenue generated from supplemental screening such as the MRI exams—which grew from 30 to more than 300 exams per year—allowed Singing River to expand their program and open another facility to better serve their broader patient population.

HIGH-RISK BREAST MRI	2020	2021	2022	TOTAL
Qualified	117	919	840	**1876**
Completed	43	369	277	**689**
BI-RADS® 1/2	38	329	262	**629**
BI-RADS 0/3/4+	5	40	15	**60**
Calculated high risk through genetic testing	9	45	31	**85**
OUTCOMES				
Benign	4	25	6	**35**
Malignant	0	3	4	**7**
Incomplete follow-up	1	12	5	**18**

Technology in use

EHR: Epic

Imaging: Breast MRI, contrast-enhanced mammography – handheld ultrasound, 3D mammography

Biopsy: ultrasound, MRI, and stereotactic

Genetic Lab: Myriad, Myriad Patient Education System

Risk Assessment Software: Volpara Risk Pathways

Models used: TC8, NCCN Guidelines

Breast Density Assessment: Volpara® Scorecard™ software

Patient workflow – Genetics education

Mammogram exam day

- Patient arrives at the mammogram appointment and completes risk assessment survey in the waiting room
- Genetic testing eligibility determined in Risk Pathways according to NCCN Guidelines
- Patients identified as eligible for genetic testing are flagged in their personal medical record in Epic
- After the mammogram, the technologist checks genetic eligibility in the patient record. If the patient is interested, they are taken to a TeleEducation room where they are provided a tablet to view a short video. Instructions in the room direct the patient to call a phone number after viewing the video
- The phone connects the patient with a Myriad genetic counselor who provides a brief education session
- Upon completion of the phone call, the patient rings a "doorbell" and a technologist brings them back to the waiting area

Same day genetic testing

- If that patient decides to go forward with the test, the Myriad genetic counselor emails a test request form (TRF) to the breast navigator responsible for sample collection
- The breast navigator prints the TRF, pedigree, and chart note (from the email) and copies the front and back of the insurance card
- The TRF is completed with the patient, including date, test to be ordered, patient signature, and HCP signature/stamp
- A sample (blood or saliva) is obtained. It is included with the completed paperwork and put into a shipping package
- The patient departs

Genetic post-test process

- The patient receives the genetic test results via a telephone call prior to receiving the test result packet in the mail
- Myriad also provides post-test counseling/education with a genetic counselor. Instructions in the packet direct the patient to make an appointment for a telephone consultation with a Myriad counselor
- This service is included in the cost of the test and there are no additional charges to the patient
- Upon completion of counseling, the genetic counselor faxes a report for the patient's chart and the referring physician is sent a letter

The onsite genetic testing advantage

Offering onsite genetic counseling and testing was important in completing the circle of care for Singing River. Twenty-five percent of screening patients have met the NCCN Guidelines for genetic testing, yet genetic testing can be a stressful consideration for many women, especially for those with lower health literacy. It is important to educate the patient while they are in the center to answer questions and address any concerns. The likelihood of a patient completing a genetic test after leaving the center drops dramatically.

Since inception, more than 73 patients have been found to have pathogenic mutations.

		2020	2021	2022	TOTAL
Qualified		487	3390	3257	**7134**
Resulted		140	1092	700	**1932**
Positive		4	43	26	**73**
Negative	**Negative**	77	609	319	**1005**
Negative	**Elevated Risk**	56	423	334	**813**
Carrier Status/ MUTYH		3	17	21	**41**

- Carrier status
- Pathogenics
- Prostate only

Genetic mutations for hereditary cancer

GENE	ASSOCIATED WITH	NOV. & DEC. 2020	2021	2022	TOTAL
HOXB13	Prostate only		3	2	**5**
APC	Colorectal, Gastric, Pancreatic			1	**1**
MITF	Skin			3	**3**
SDHA	Renal, Endocrine			2	**2**
BRCA1	Breast, Ovarian, Pancreatic, Prostate		7	1	**8**
BRCA2	Breast, Ovarian, Pancreatic, Prostate, Melanoma	1	7	0	**8**
BARD1	Breast only	1	1	2	**4**
BRIP1	Ovarian		2		**2**
PALB2	Breast, Ovarian, Pancreatic		3	2	**5**
ATM	Breast, Pancreatic		3	3	**6**
CHEK2	Breast, Colorectal		7	5	**12**
RAD51C	Ovarian	1	1	0	**2**
NBN	Breast, Prostate	1			**1**
EGFR	Lung				
MSH2	Lynch Syndrome: Ovarian, Colorectal, Endometrial, Pancreatic, Gastric, Prostate		1	0	**1**
MSH6			2	0	**2**
PMS2			1	1	**2**
MLH1			1	0	**1**
CDKN2A	Melanoma, Pancreatic		1	1	**2**
*PALB2 & CDKN2A***	(see descriptions above)			1	**1**
CHEK2 & EGFR	(see descriptions above)				
AXIN2	Colorectal		1		**1**
MSH3	Colorectal			1	**1**
MSH3 Carrier	Colorectal		1	1	**2**
MUTYH Carrier	Colorectal		13	17	**30**
NTHL1 Carrier	Colorectal		2	2	**4**
FH Carrier	Skin, Renal			1	**1**
BRIP1 Carrier	Ovarian		1		**1**
*RNF 43** Carrier	Colorectal			1	**1**
APC Carrier	Colorectal, Gastric, Pancreatic		2		**2**
		4	60	47	**111**

Importantly, 813 patients (42%) received negative genetic results but were found to still be at elevated cancer risk—based on personal or family history—and were directed to new surveillance recommendations.

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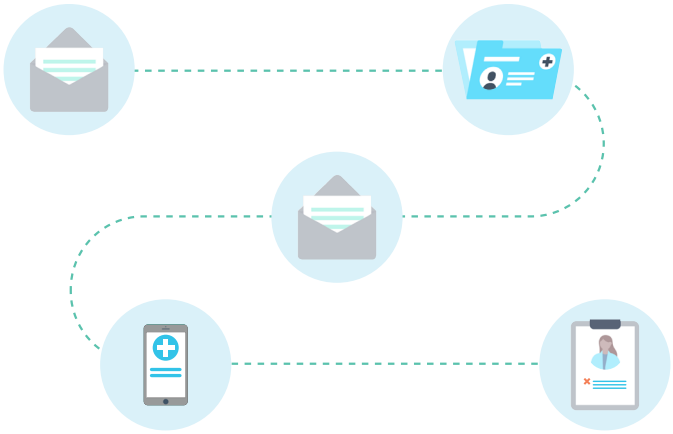
Tackling noncompliance

Research has shown, the more patients struggle to find and understand information and medical services, the lower the utilization of primary and preventative care. This includes routine mammography screening and its associated care pathways.

To provide extra follow-up, a special process was enacted after the mammography exams and Epic-generated letters were mailed to every patient. For those at high risk for breast cancer, MRI orders are put into the patient record and a follow-up appointment is ready to be scheduled. A second letter is sent out to those patients explaining the need for MRI imaging. A week later, the scheduling department receives a list of patient names, and each patient receives at least two phone calls trying to confirm an appointment. If the patient is unsuccessfully scheduled for the supplemental MRI screening, a note is put in their chart to indicate that they did not complete the recommended MRI.



This level of notification is not only necessary for patients, but also for providers. Some providers reject supplemental screening orders for patients. In one such case, a primary care physician delayed signing an MRI order. Educational materials were provided to the physician, including the MRI order, the screening workflow, and the NCCN Guidelines. The provider eventually signed the MRI order, and the patient was able to complete the screening. The exam presented a BI-RADS 4 score recommending biopsy. The biopsy revealed invasive carcinoma and the patient then opted for bilateral mastectomies. All the patient's past mammograms, including her most recent one, had been negative.

Future goals and expanding outreach

Singing River's cancer risk assessment program is now standard of care for its patient population, but the health system still sees opportunities for improvement.

> "The hardest parts are in the beginning, getting over those hurdles and then you just tweak here and tweak there."
>
> —Tami Hudson, RN, BSN, BHCN, Breast Health Navigator, Radiology

Broader educational efforts and community outreach are needed to expand and reach more vulnerable, high-risk patients. Technology enhancements such as the ability to complete risk assessment surveys via Epic's MyChart app before an appointment will improve the patient experience. Adding automated whole breast ultrasound as a supplemental screening option for patients with dense breasts will improve compliance and detection. Lastly, adding another provider to the high-risk clinic to support other pathogenic mutations will deliver even better care to Singing River's high-risk patients.

The Singing River website displays their philosophy and an important message for their community: "Healthcare is self-care . . . taking care of ourselves is key."

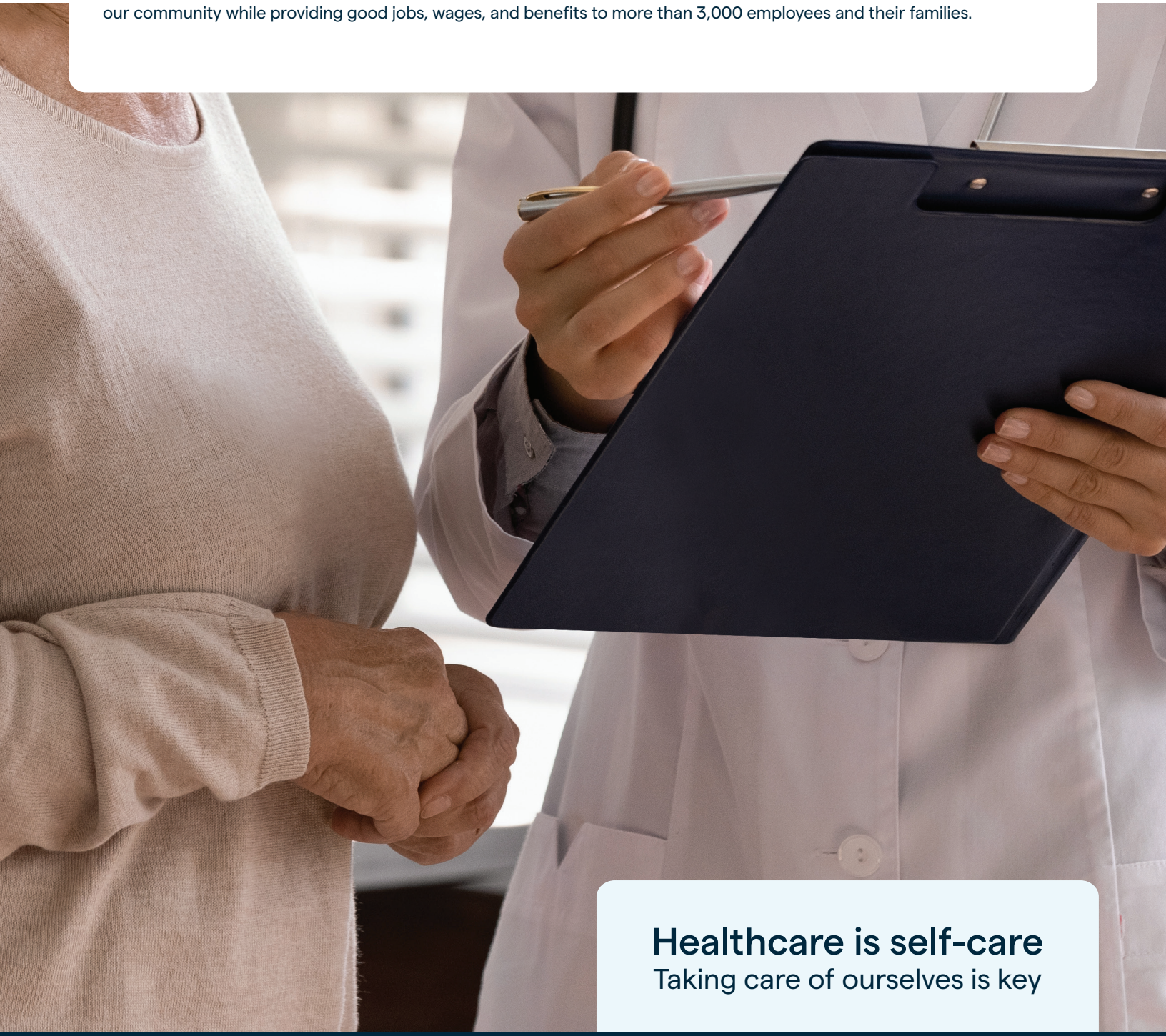
- We partner with our patients in their care. The partnership works both ways.
- We are here to help providers take care of their patients.
- Persistence and ownership of the programs are the keys to success.

This institution is dedicated to a population of patients that has not always followed through with the recommended care. It identifies the patient as an important partner in their own care. Singing River has faced the reality and has made a major investment in the future health of their community by instituting a risk assessment program.

About Singing River Health System

Singing River Health System is a community-owned, not-for-profit health system, and a mission-driven provider of health services. As one of the largest employers on the Mississippi Gulf Coast, Singing River Health System is comprised of three hospitals: Pascagoula Hospital, Ocean Springs Hospital, and Gulfport Hospital. In addition, the Health System operates primary care medical clinics, community medical parks, and specialty centers throughout the area.

Every day our dedicated team of caregivers makes an impact on the lives of almost everyone in our community, often in more ways than one. We provide critical health services, numerous community outreach programs, and charitable services and educational programs. We strengthen the local economy by recruiting over 300 of the very best physicians and other professionals to our community while providing good jobs, wages, and benefits to more than 3,000 employees and their families.



Healthcare is self-care
Taking care of ourselves is key

About Volpara Risk Pathways

Volpara Risk Pathways™ software has been used by more than 1,000 providers across the United States to identify, manage, and improve outcomes for patients at elevated risk for developing cancer. It conducts more than three million cancer risk assessments each year and can be deployed stand-alone or fully integrated with electronic health record systems, mammography reporting systems, and genetic laboratories. Volpara's comprehensive Professional Services offering helps customers maximize the value of their high-risk cancer assessment programs. Our Professional Services team features experienced professionals who previously managed their own programs. They bring decades of expertise in supporting leading clinical sites around the world, skillfulness and dedication that can help programs at each step and empower them to keep pace with rapidly changing risk assessment and genetic landscapes.

References

1. https://www.cancer.org/about-us/what-we-do/health-equity/cancer-disparities-in-the-black-community.html

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