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COMPREHENSIVE BREAST CENTER
AT SAN FRANCISCO GENERAL HOSPITAL MEDICAL CENTER

Improving the Identification of Underserved Women at High Risk for Breast Cancer and Increasing the use of Breast MRI Screening in this Population

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Disclosures

- No authors have anything to disclose

Background

- In the United States, breast cancer is the second leading cause of death of women[1]
- The average lifetime risk for developing breast cancer is 12.4%, or 1 in 8 women[1]
- For women of average risk, annual mammography is the recommended screening imaging modality in women of ages 40 and over[2]
- According to the American College of Radiologists (ACR) and the American Cancer Society (ACS) patient's who are at high-risk for developing breast cancer should undergo annual screening MRI in addition to annual screening mammography[3]

Background

- Patient's who are defined as high risk include those with[3]:
  - >/ 20-25% lifetime risk of developing breast cancer
  - BRCA1 or BRCA2 gene mutation
  - First degree relative with a BRCA1 or BRCA2 gene mutation but themselves untested
  - History of chest wall radiation between the ages of 10 and 30 years old
  - Li-Fraumeni syndrome, Cowden syndrome, Bannayan-Riley-Ruvalcaba Syndrome
    - or a first degree relative of one of these syndromes

Background

- Calculating a patient's lifetime risk for breast cancer is important for determining which patients meet criteria for breast MRI (>/20-25% lifetime risk)
- Several risk prediction models are available:
  - Gail Model (and Modified Gail model), Tyrer-Cuzick, Claus, BRCApro
    - Tyrer-Cuzick model has been found to be most consistent model[4]
    - Gail Model shown to underestimate risk compared with Tyrer-Cuzick[5]
    - Berg AJR 2008 states GAIL model should not be used for selecting patients for MRI screening
      - » Does not consider age of diagnosis in first-degree relatives or breast cancer in second-degree relatives[5]

Background

- Breast MRI screening is an ADJUNCT to mammography
  - At UCSF we alternate MRI and mammography every 6 months
  - However, the exams may be performed either staggered OR concurrently
    - Le-Petross et al.
      - Retrospective review of BRCA patients undergoing alternating mammograms and breast MRI
        - » 73 women, 13 cancers in 11 women, 12 of which detected on the MRI but *NOT* the mammogram 6 months prior[6]
    - Lowry et al.
      - For BRCA mutation carriers annual MRI starting at age 25 and alternating mammography starting at 30 most effective[7]
    - Cott Chubiz et al.
      - For BRCA mutation carriers, alternating MRI and mammography may be most cost-effective[8]

Background

- In vulnerable women, unequal access to all breast imaging modalities, such as breast MRI, may lead to delays in diagnosis and poorer outcomes
- Wernli et al. looked at patterns of breast MRI use in community practice
  - Compared with women screened for breast cancer by mammography alone, women screened using breast MRI were significantly more likely to be white and non-Hispanic[9]
- Onega et al. looked at geographic access to breast imaging modalities
  - Travel travel times to mammography and ultrasound services were short for the majority of women
  - Travel times to MRI were much longer
    - In particular, Native American women and rural women were disadvantaged in geographic access[10]

Background

- Onega et al.
  - Sociodemographic factors were related to excess travel time for screening MRI
    - Non-Hispanic black compared to non-Hispanic white women, the adjusted odds of traveling farther than the closest facility was more than two times higher for MRI[11]
- Haas et al.
  - Among women with >/20 % lifetime risk of breast cancer, high-risk women with a high school education or less were less likely to undergo screening MRI than women who had graduated from college, no statistically significant difference in use of screening MRI by race or ethnicity[12]
- However, in contrast Lee et al.
  - Imaging facilities serving vulnerable women were just as or more likely to have on-site availability of advanced breast imaging modalities[13]

Background

- Breast cancer risk assessment coupled with access to breast MRI are essential for identifying and screening patients at high risk for developing breast cancer
- Breast cancer risk assessment services/genetic counseling and breast MRI are resources available at our county breast clinic, which serves an underserved/vulnerable patient population
  - We noticed these services were being underutilized at our county breast center which serves an underserved patient population
- Both breast cancer risk assessment/genetic counseling as well as breast MRI are services available at our county hospital (Zuckerberg San Francisco General Hospital); however we noticed these resources were being underutilized by our patients

Purpose

The purpose of this project was twofold

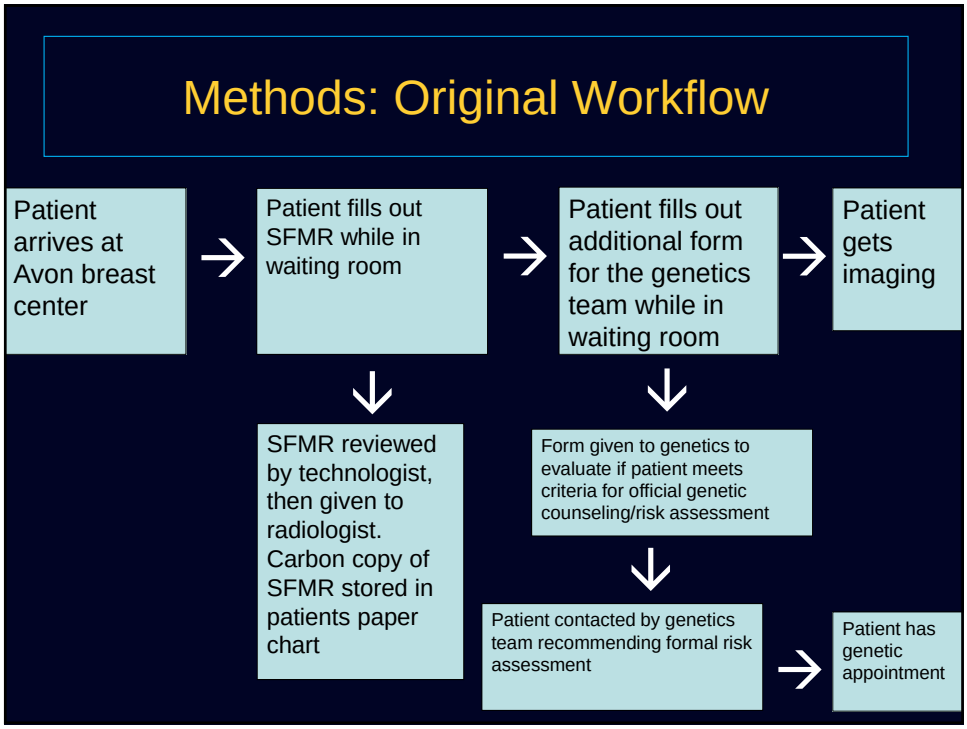
1. To increase the identification of underserved women at high risk for breast cancer at our county hospital
2. To increase appropriate use of screening breast MRI in these patients

Methods

- Our quality improvement project team:
  - Breast radiologists
  - Genetic counselors
  - MDs and NPs in the women's clinic and the breast cancer clinic
  - Breast imaging chief technologists
  - Radiology IT team

Methods

- The first intervention we made was aimed towards identifying more patients for formal breast cancer risk assessment
  - When patients arrive at our breast care center they are asked to fill out a San Francisco Mammography Registration (SFMR) form (which has an attached carbon copy) and in addition they were asked to fill out an extra form with a list of questions related to breast cancer risk. This additional form was what the genetics team was using to identify patients to officially screen for breast cancer risk status
    - All but two of the questions on the form for our genetics team were duplicates of questions already being asked on the SFMR each patient fills out
  - We decided to no longer ask the patients to fill out this additional form, as this required extra unnecessary effort from our patients
    - In place of it we gave our genetics team the carbon copy of the SFMR that ALL patients were filling out, reducing the amount of paperwork our patients were asked to do
  - Our genetics team tracked data on number of patients filling out the required form to be assessed for genetic risk assessment the three months prior to (October 2015-December 2015), and the three months following (January 2016 – March 2016) making this intervention



Original form our genetics team was using to identify patients to contact for genetic/risk assessment

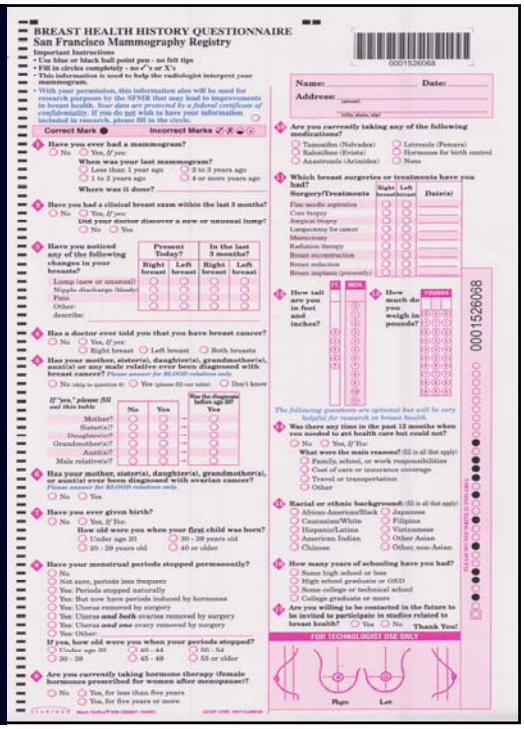
Start with the boxes under #1.

Your Family	1. No breast or ovarian cancer or don't know	2. Breast cancer at age 50 or older	3. Breast cancer before age 50	4. Breast cancer in both breasts	5. Cancer of the ovaries (not the same as uterine or cervical cancer)
You					
Mother					
Daughter(s)					
Either grandmother (mother or father's mother)					
Aunts (mother or father's side)					
Sister(s) 1 sister					
2 sisters					
3 sisters					

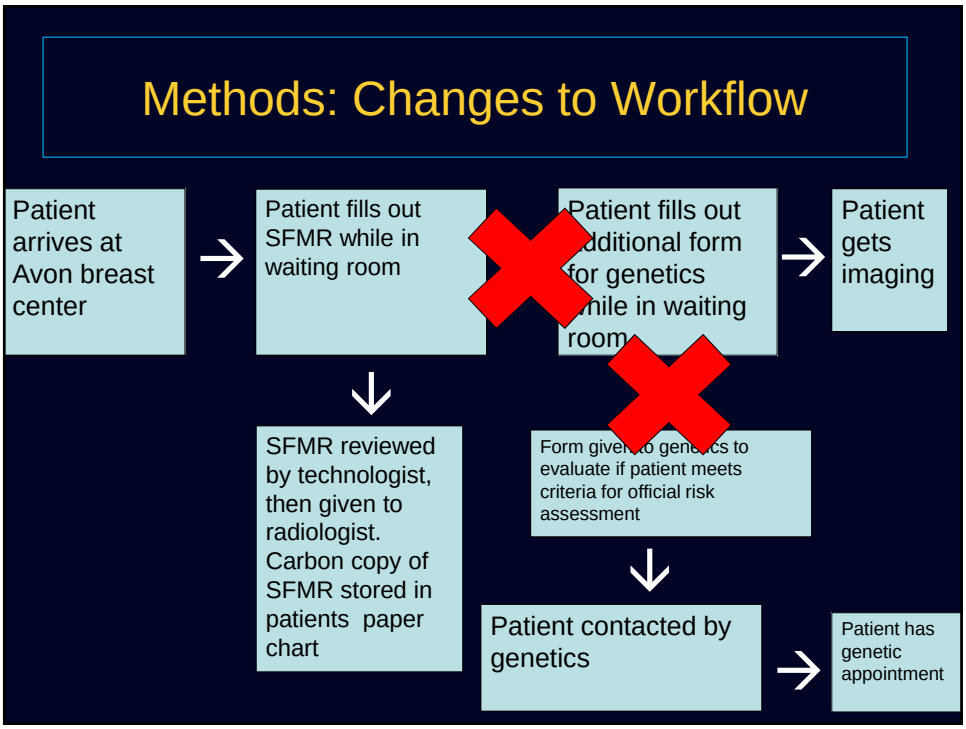
6.	No or don't know	Yes
Any men with breast cancer?		
Any Jewish Ancestry?		
Any relatives had genetic testing for breast cancer?		

San Francisco Mammography Registry (SFMR)

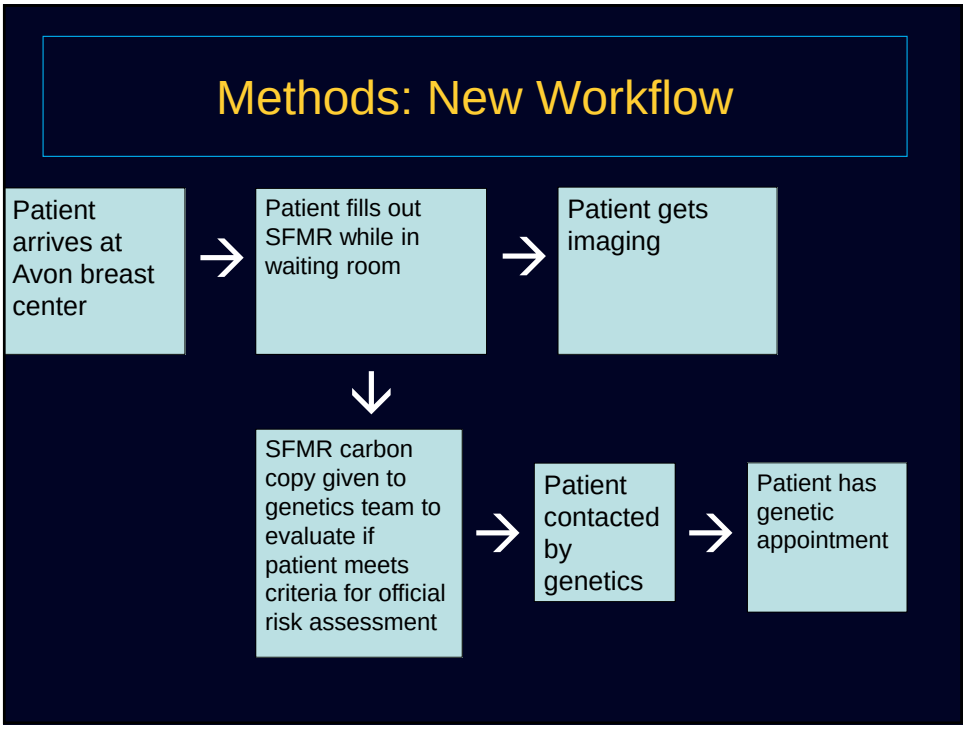
- All patients at our breast center are required to fill this form prior to their imaging examination
- There is a carbon copy attached to the back of this form
- Most patients fill out this form completely
- We have “navigators” at our Avon Breast Center who speak various languages, they help our patients fill out this form if English is not their first language
- Two questions addressing risk factors that were on the prior form and not this: Jewish ancestry and family members with genetic testing for breast cancer
- Given very few patients were filling out the additional genetics form, and there was almost all the information being asked on that form on the SFMR, we decided to reduce paperwork given to our patients, we stopped asking them to fill out the additional form, and instead we started giving the carbon copy of this SFMR to our genetics team to identify patients for formal genetic risk assessment


BREAST HEALTH HISTORY QUESTIONNAIRE
San Francisco Mammography Registry

Methods: Changes to Workflow



Methods: New Workflow



Methods

- The second intervention we made involved educating referring providers about the appropriate indications for high risk screening breast MR
  - It came to our attention that several of our referring providers at the county hospital were not familiar with the ACS guidelines for which patients meets high-risk criteria to be screened with breast MRI in addition to mammography
  - Therefore, we decided to provide basic education sessions for our providers
  - We set up dedicated time for a teaching session during one of our monthly breast interdisciplinary conferences
    - We invited several of our referring providers to this session
    - During this session one of our breast imaging radiologists reviewed the ACS's guidelines for high-risk screening MRI and answered questions from our providers
  - Additionally we sent a word document via e-mail with these guidelines to several of our referring providers and our genetic counselors
  - Through our radiology IT system we collected data on number of MRIs performed for the indication of high-risk screening for the 3 months prior to our intervention, October 2015 through December 2015, and 3 months following our intervention, January 2016 through March 2016

Example of the handout we sent to our referring providers and genetics team, with indications for screening MRI, and also information on patients who do not meet criteria for screening MRI

AMERICAN CANCER SOCIETY SCREENING RECOMMENDATIONS

Women who are at high risk for breast cancer based on certain factors should get an MRI and a mammogram every year. This includes women who:

- Have a lifetime risk of breast cancer of about 20% to 25% or greater, according to risk assessment tools that are based mainly on family history (such as the Claus model)
- Have a known *BRCA1* or *BRCA2* gene mutation
- Have a first-degree relative (parent, brother, sister, or child) with a *BRCA1* or *BRCA2* gene mutation, and have not had genetic testing themselves
- Had radiation therapy to the chest when they were between the ages of 10 and 30 years
- Have Li-Fraumeni syndrome, Cowden syndrome, or Bannayan-Riley-Ruvalcaba syndrome, or have first-degree relatives with one of these syndromes

If MRI is used, it should be in addition to, not instead of, a screening mammogram. This is because although an MRI is a more sensitive test (it's more likely to detect cancer than a mammogram), it may still miss some cancers that a mammogram would detect.

For most women at high risk, screening with MRI and mammograms should begin at age 30 years and continue for as long as a woman is in good health. But because the evidence is limited about the best age at which to start screening, this decision should be based on shared decision-making between patients and their health care providers, taking into account personal circumstances and preferences.

The American Cancer Society recommends against MRI screening for women whose lifetime risk of breast cancer is less than 15%.

There's NOT enough evidence to make a recommendation for or against yearly MRI screening for women who have a moderately increased risk of breast cancer (a lifetime risk of 15% to 20% according to risk assessment tools that are based mainly on family history) or who may be at increased risk of breast cancer based on certain factors, such as:

- Having a personal history of breast cancer, ductal carcinoma in situ (DCIS), lobular carcinoma in situ (LCIS), atypical ductal hyperplasia (ADH), or atypical lobular hyperplasia (ALH)
- Having dense breasts ("extremely" or "heterogeneously" dense) as seen on a mammogram

Initial Results

	Prior to Intervention: Additional form (10/2015-12/2015)	Following Intervention: SFMR (1/2016-3/2016)
Total # patients who completed the required form for genetic testing screening	609	2,212
Met high risk criteria	50/609 (8.2%)	134/2,212 (6.1%)

After the intervention a slightly lower percentage of patients met high risk criteria; However, the overall number of patient's identified increased 2.7x

Initial Results

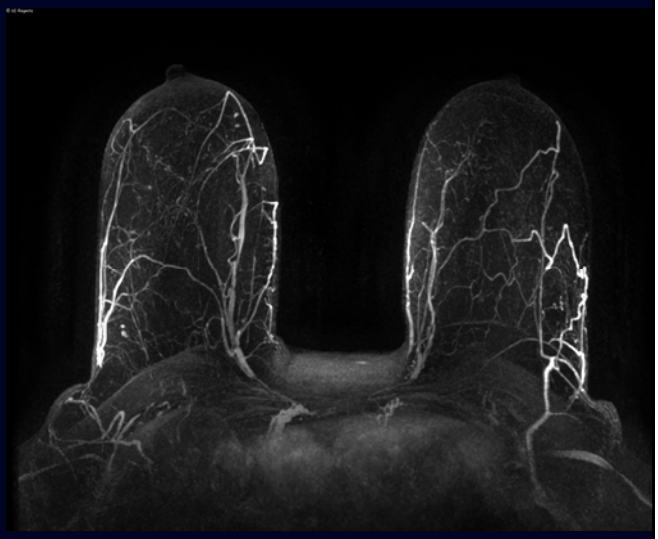
	Prior to Intervention (10/2015-12/2015)	Following Intervention (1/2016-3/2016)
# breast MRIs with clinical indication high-risk screening/total # breast MRIs performed (and percent of total MRIs performed)	8/16 (50%)	14/25 (56%)

Example Patient

61 year old with BRCA 1 mutation and with history of endometrial cancer, normal screening mammogram

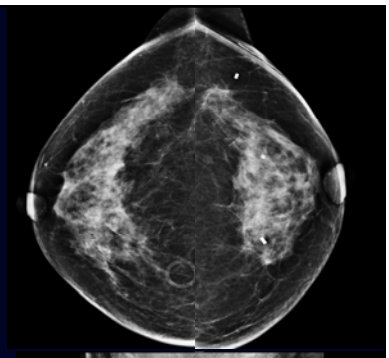
After the teaching sessions with our referring providers, additional breast cancer screening with breast MRI was performed

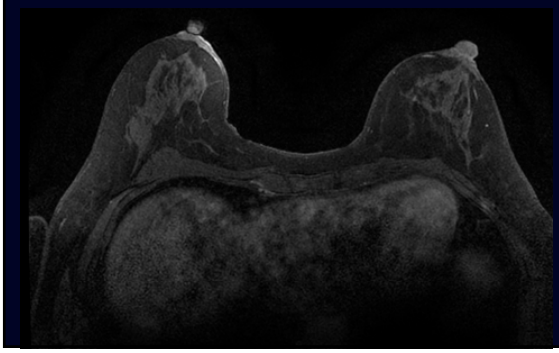
Post-contrast axial MIP image demonstrates minimal background parenchymal enhancement (BPE) and no suspicious abnormal enhancement

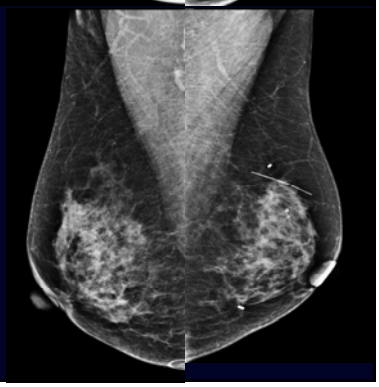


58 year old with dense breasts, history of surgical biopsy revealing lobular carcinoma in situ (LCIS), with normal screening mammogram

Lifetime risk of breast cancer > 20%, therefore screening breast MRI was also ordered following a genetic risk assessment







Conclusion

- Simple interventions – such as decreasing required paperwork and basic teaching sessions - at our county hospital lead to increased utilization of both breast cancer risk assessment services as well as increased breast MRIs performed for high-risk screening

Discussion

- Our successful genetic assessment approach can serve as a model for other county hospitals wanting to provide this service
- Our model for improving education to referring providers is easily replicable, cost and time efficient at a busy county hospital

Discussion

- Despite identifying several more patients for formal breast cancer risk assessment, several of the patients identified are not following up with our genetic team for formal risk assessment
- Underserved populations present different challenges for genetic counselors due to various factors including, language, health literacy, and cultural taboos about cancer diagnosis
- This suggests that more education is needed in this patient group

Discussion

- The number of breast MRIs done for high-risk screening increased with simple teaching sessions
  - However both the total number of breast MRIs performed as well as those done for high-risk screening are very low at our county hospital
- After the initiation of this project and our data collection, our new county hospital has opened (Zuckerberg San Francisco General)
  - We will have three new MRI scanners at this hospital, and therefore increased access to breast MRI for our patients at our county hospital
  - We anticipate the increased access to breast MRI will lead to increased breast MRIs performed with more follow-up

Future Plans

- Continue to contact patients for formal genetic risk assessment
- Continue education through teaching sessions and e-mails for both our patients and our referring providers on:
  - Risk factors for breast cancer
  - Appropriate breast cancer screening
  - Available resources at our county hospital for breast cancer screening and genetic risk assessment
- We continue to track our data and will do so over a longer duration to more fully analyze the impact on uptake of genetic counseling and genetic testing
- With longer term follow-up we hope to track number of cancers, size of cancers, and stage at diagnosis, detected on screening MRIs done for high-risk screening
- We hope over time to show that we are detecting cancers at smaller sizes, and at lower stages, in our patients at high-risk for breast cancer at our county hospital

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Thank You!

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