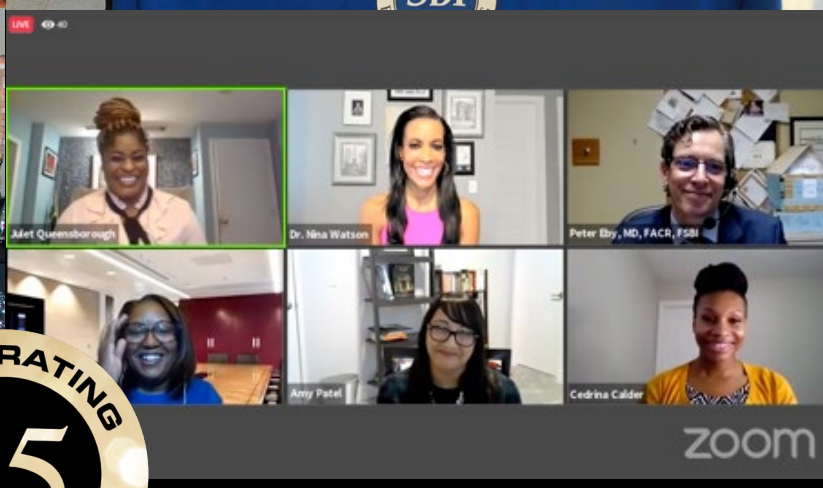
ISSUE 3 | 2020

SBI NEWS

The Member Newsletter of the Society of Breast Imaging

SPECIAL EDITION: INTERVIEWS WITH FOUNDING MEMBERS



CELEBRATING 35 YEARS

Top: Founding members of the Society of Breast Imaging, pictured left to right: Stephen Feig, MD; Harold Moskowitz, MD; Myron Moskowitz, MD; Marc Homer, MD; Edward Sickles, MD; Carl D'Orsi, MD.

Bottom: 2018 – 2019 SBI Board of Directors at SBI 2019 in Hollywood, FL, pictured left to right: Wendy DeMartini, MD, Past President; Elizabeth Morris, MD, Chair of Fellows; Emily Conant, MD; Mary Newell, MD; Margarita Zuley, MD, Immediate Past President; Jennifer Harvey, MD; John Lewin, MD; Jessica Leung, MD, President; Paula Gordon, MD; Daniel Kopans, MD, Past Chair of Fellows; Jay Baker, MD, Past President.

Top: SBI staff, pictured left to right: Yasmeen J. Fields, MS, CAE, Executive Director; Nicole M. Hardy, Membership & Marketing Specialist; Natalie Ward, Education Coordinator; Jennifer Luettinger, Education Program Manager; Kesha L. Willis, Director of PR & Communications.

Bottom: Zoom Health Equity Discussion Panel, pictured clockwise, from top left: Julet Queensborough, Breast Health Navigator; Nina Watson, MD; Peter Eby, MD; Cedrina Calder, MD; Amy Patel, MD; Regina Hampton Coleman, MD.

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President's Column

OUR SBI MISSION:

To save lives and minimize the impact of breast cancer

OUR SBI VALUES:

Patient-centered and evidence-based care

Excellence in education

Scientific integrity

Collaboration and collegiality

Respect for diversity and inclusiveness

Jessica Leung,
MD, FACR, FSBI
President of the SBI

To quote Nobel Laureate Bob Dylan, "The Times They Are A-Changin'." This is no ordinary year, and these are extraordinary times. The ongoing, evolving coronavirus disease 2019 (COVID-19) pandemic, the national (and international) outcry for social justice and equality, and unprecedented climate events all lead us to evaluate our place. Along with anxiety and uncertainty, there are opportunities and the gift of evaluating how to do more and better than we did before. I am happy, excited, humbled, and proud to write my first President's Column.

This is the 35th year since the SBI was founded in 1985. At that time, 6 young radiologists had a vision and embarked to reduce the mortality and morbidity of breast cancer through breast imaging. They recognized wisely and early the need for advocacy and education. This issue features interviews of our 6 founding members, conducted by the 5 most recent past presidents and myself. This is a special and personal endeavor for us to honor and learn from them, giving us insights into the origins of our society—how it has grown, challenges it has faced, achievements it has garnered, and the good that it has done. SBI was small when it was founded in 1985, and not until 1999 was the idea of general members (in addition to fellows) introduced. This opened up the possibilities of large-scale involvement and contributions by many. The society went through many changes, including expansion into a larger and more varied Board of Directors. Modalities have certainly evolved over the years, from xeromammography to the current contrast-enhanced, artificial intelligence–assisted techniques. Through it all, challenges were met, hurdles were crossed, and progress was made.

I missed seeing all of you at the annual symposium this past April. Yes, we were looking forward to the 35th anniversary celebration, including our first-ever gala. No one enjoys a party as much as I do! But alas, the COVID-19 pandemic made it unsafe for us to hold a large in-person symposium in 2020, and the ongoing concerns have prompted us to not plan any in-person gatherings in 2021 as well. But as the saying goes, when one door closes, another door opens. COVID-19 came upon us somewhat quickly in 2020, but we are eager to present our first-ever virtual symposium in 2021! This will be a completely new venture for us. We hope that participation will be maximized, especially since there is no need for travel. In addition to world-class didactic lectures, we aim to offer inventive, creative ways to socialize and network. We plan to partner with our colleagues in industry to connect you with the newest technological advances. Instead of allowing COVID-19 to make us stand still, we are moving forward as a society and continuing to innovate as a legacy to our founders and early adopters of mammography, who created the society that we know and love today.

Our world is changing, and so is our way of learning. Along with Zoom cocktail hours and birthday celebrations, virtual learning is now the norm. Who would have known that Zoom parties would be a thing? The cancellation of the 2020 symposium has left us with an education gap, and we have been working diligently to release as much educational content as quickly as possible. The CME & SAM Committee, under the direction of Linda Moy, MD, FSBI, has selected content from archived symposium lectures to create a new magnetic resonance imaging and digital breast tomosynthesis online product. The non-CME archived symposium content that we used to create the Resident and Fellow Section (RFS) lecture series and the Symposium Replay are available without charge, and all 3 SBI-hosted webinars that took place this summer will become enduring and available for free CME soon. Sincere thanks to all the faculty members who have contributed to these educational materials. And don't forget about the potential of 6 CME credits through our *Journal of Breast Imaging*!

COVID-19 is arguably the most significant health care crisis in all our living memory. Interesting and disturbing facts came out loud and clear from this crisis: racial and socioeconomic determinants affect disease outcomes. Health care disparities have long been known in breast cancer and screening. The current issue of *Journal of Breast Imaging* includes an excellent article on screening mammography in African American women along with insightful commentary by Editor Jennifer Harvey. For the first time in my career, I am hearing the phrase "systemic racism in health care." This is obviously a complex and complicated, multipronged issue that challenges our society. Whether it is a matter of access, outreach, unconscious basis, or simple lack of insurance, striving for quality health care for all is clearly our common worthy goal. We see the NFL and the Oscars striving for similar goals for equality and inclusion! In the SBI, the Inclusion Diversity Equality Alliance is actively chartering our society's path. What is most encouraging—and perhaps most important—is our current recognition and acknowledgment of this challenge and our resolve to improve, together, as a community and a society.

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Editor's Note

By Shadi A. Shakeri, MD

Shadi A. Shakeri, MD

This may be the most exciting issue I've had the pleasure of working on in my time serving on the Newsletter Committee. This issue represents where we have been and how far we've come with an eye on the future. The 2020 SBI Symposium (which had to be canceled because of the coronavirus disease 2019 [COVID-19] pandemic) was to mark the 35th anniversary of the founding of the SBI.

It would have surely been a memorable meeting to gather in what now seems like an old-fashioned way of being in each other's physical presence to learn, enjoy a laugh together, and reminisce about times gone by. Since we didn't have the opportunity to celebrate the origins of our society, we decided to feature the members who founded the SBI 35 years ago. We pay homage to these 6 giants in breast radiology by asking them to recount how it all began. The founding members to whom we owe a debt of gratitude for starting our beloved society are Carl D'Orsi, MD, FACR, FSBI, Edward Sickles, MD, FACR, FSBI, Harold Moskowitz, MD, FACR, FSBI, Myron Moskowitz, MD, FACR, FSBI, Stephen Feig, MD, FACR, FSBI, and Marc Homer, MD, FACR, FSBI. And what better way to hear their stories and thoughts than to ask our 6 most recent past presidents of the society, Murray Rebner, MD, FACR, FSBI, Jessica Leung, MD, FACR, FSBI, Wendy DeMartini, MD, FSBI, Elizabeth Morris, MD, FACR, FSBI, Rita Zuley, MD, FACR, FSBI, and Jay Baker, MD, FACR, FSBI, to have a conversation with them.

As we look back to our past, we also have other urgent reporting on matters critical to us as breast radiologists and the greater population at large today. The pandemic—no, not the viral one, but of racism—that has deeply permeated the fabric of our country has finally come front and center after the violent deaths of George Floyd and Breonna Taylor. Acknowledging systemic racism in medicine is a crucial first step for finding a path forward to serve all of our patients the best way possible. In his What's New in the News column, Randy Miles, MD, focuses his lens on how existing social injustices in medicine have an immediacy for us as breast radiologists. This highly relevant article is a must-read, with a reference list that you will want to have at your fingertips as we work to eliminate disparities in breast cancer in Black women. In this Breast Cancer Awareness Month, I invite you to use his article as a starting point of examining your local practice and how you can fight racism in medicine by bringing equitable breast radiology care to women of Black race and other racial/ethnic minorities.

We have of course not forgotten about the other pandemic and its disastrous consequences worldwide. We cover this hot topic from the viewpoint of the European Society of Breast Imaging and learn about how they are dealing with the ramifications of COVID-19 for their members. Related to the toll that COVID-19 has taken on all of us, Eric Rosen, MD, FACR, FSBI, reports on a terrific free tool from the ACR for assessing and improving wellness in a time when it feels like a piece of sky is falling daily.

There are many more articles in this issue that I hope you will find informative and a joy to read. These include the perspective from a patient's point of view of her breast cancer journey and survivorship in an interview of Anna Crollman by Hannah Perry, MD. We have the pleasure of introducing you to 3 newly inducted SBI Fellows: Jiyon Lee, MD, FACR, FSBI, Fernando Collado-Mesa, MD, FSBI, and Alfred B. Watson Jr, MD, MPH, FACR, FSBI, FACPM. The Physics column, as always, gives us a capsule of cutting-edge science and updates our knowledge; this one by Despina Kontos, PhD, informs us on radiomics and radiogenomics for breast cancer imaging. Our technologists' techniques can get a refresher from Dawn Derenburger, RT(R)(M), and Robyn Hadley, RT(R)(M). Finally, we look to the future with the Members in Training article by Sophia O'Brien, MD. She brings us a discussion on the breast imaging fellowship National Residency Match Program application cycle and quite a few resources for applicants to use as they prepare for the all-new virtual interview season. It's a whole new world to navigate!

On a personal note, the 35th anniversary of the SBI coincides with my 35th year after immigrating to this country. Acknowledging my roots, celebrating the journey that has made me the amalgam that I am today, and looking forward to leaving things better for those who will come after me are parallels, I feel, with how we decided to celebrate our society with this issue. I am eternally grateful to have found my professional calling and to belong to the SBI family.

Past Presidents


Jessica Leung, MD
2020


Margarita L. Zuley, MD
2019


Jay Baker, MD
2018


Wendy DeMartini, MD
2017


Elizabeth Morris, MD
2015, 2016


Murray Rebner, MD
2013, 2014


Debra L. Monticciolo, MD
2011, 2012


W. Phil Evans, MD
2009, 2010


Carol H. Lee, MD
2007, 2008


R. James Brenner, Jr, MD
2005, 2006

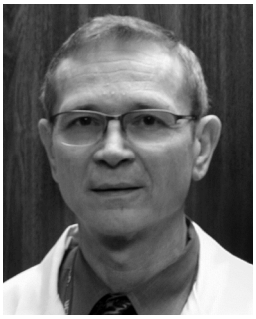

D. David Dershaw, MD
2003, 2004


Barbara S. Monsees, MD
2001, 2002


Stephen A. Feig, MD
1999, 2000


G.W. Eklund, MD
1997, 1998

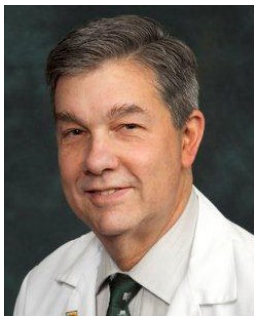

Carol B. Stelling, MD
1995, 1996


Lawrence W. Bassett, MD
1993, 1994


Valerie P. Jackson, MD
1991, 1992


Edward A. Sickles, MD
1990


Carl D'Orsi, MD
1989


Marc J. Homer, MD
1985, 1986, 1987, 1988

Interview: SBI Founding Member Carl D'Orsi, MD, FACR, FSBI

By Murray Rebner, MD, FACR, FSBI

Murray Rebner, MD, FACR, FSBI

MR: What are your thoughts on the progression of the society? Do you see anything that has not come to fruition yet?

CD: I am pleased to say that SBI is going in the right direction. I think that research remains an ongoing important issue and should not just be given lip service. It should be emphasized. SBI should continue to aid in research and foster young researchers by supporting them financially with grants.

We are doing exactly that.

If you are in good financial shape, you might want to consider increasing the amount you are currently giving. Investing in young researchers is investing in SBI's future.

What is your advice to young professionals regarding breast imaging?

It is important to remember that breast imaging is unique in that you are not dealing with the knowledge of complex anatomy. In mammography, it is pattern recognition. It is important that we teach residents pattern recognition and how to think 3-dimensionally.

What do you think of Dr László Tabár's method of interpreting mammograms by correlating subgross histology with the mammographic image?

It is beneficial to be able to visualize the subgross histology on the mammogram and vice versa.

Can you recall the most meaningful moment in your career?

There was a meeting in the early '80s. Marc Homer, I, Ed Sickles, and Harold Moskowitz were in the pool of the hotel, and Harold Moskowitz said that we should have a society just dedicated to the imaging of the breast. We looked at each other and said hey, that is a good idea. We met a month later and decided who should be involved in the formation of the society. We talked to Myron Moskowitz, Stephen Feig, Larry Bassett, Marc Homer, and Harvey Neiman, then the executive director of the ACR. Marc Homer took the lead and drafted the bylaws. He also insisted that the stationery for the bylaws be in light green because that was his favorite color.

Carl D'Orsi, MD, FACR, FSBI

So SBI was founded in a swimming pool?

Yes. The founding members were Steve Feig, Marc Homer, Hal Moskowitz, Mike Moskowitz, Ed Sickles, and I.

What is the leadership advice you would give to future board members?

Encourage radiology residents to consider a career in breast imaging. They should know that the work we do is extremely important. Data show that breast imaging has had a positive effect in saving women's lives. Since the advent of screening mammography in 1990, the mortality rate for breast cancer has decreased 35%. Despite what other physicians, laypeople, and the press think, it is not just due to chemotherapy. Screening mammography has also decreased morbidity by allowing for less extensive surgeries, less chemotherapy, and less usage of radiation therapy.

What do you think is the most important paper you have written?

The BI-RADS paper [D'Orsi CJ, American College of Radiology BI-RADS Committee. *Illustrated Breast Imaging Reporting and Data System (Illustrated BI-RADS)*. American College of Radiology; 1998]. This paper is important not just for clinical use but also for research purposes. You need data to decide, for example, which calcifications are benign and which should be biopsied. This is the paper I am most proud of.

What will be the impact of artificial intelligence?

AI [artificial intelligence] won't replace the radiologist. It will help the radiologist. It is excellent in pattern recognition and will improve our efficiency by allowing us to accurately read more images per day. Maybe it will allow you to double the number of screening cases you can read in a day.

What about new technologies? What do you see?

Who would have thought years ago that we would be using

MRI [magnetic resonance imaging] for the breast? I didn't. Maybe more will come of CT [computed tomography]. Regardless, good research should be done on the technology itself as well as the interpretations of the breast imagers.

Who was your mentor in your career?

Ed Sickles. I bet you thought I was going to say someone who is 90 years old. However, even though Ed is a contemporary of mine, nobody can explain, publish, and make clear the things that we want better than Ed Sickles.

In 1 word, how would you describe SBI in 1985?

Pioneer.

In 1 word, how would you describe SBI in 2020?

Established.

Thanks, Carl.

Interview:
SBI Founding Member Stephen Feig, MD, FACR, FSBI

By Margarita Zuley, MD, FACR, FSBI

Margarita Zuley, MD, FACR, FSBI

Dr Stephen Feig's career in breast radiology began by happenstance while he was a junior faculty member at the University of Pennsylvania, Philadelphia, more than 40 years ago. Very early in his career, he was asked to fill in for the radiologist who read mammograms. To prepare, he attended a 1-day course offered by Dr John Wolfe. Soon thereafter, an incredible opportunity arose to participate in a large National Institutes of Health–funded study at Thomas Jefferson Medical Center, Philadelphia, and he seized upon it. He was to evaluate mammography and thermography and his career was launched. Since that time, Dr Feig has trained generations of radiologists, has published a vast number of impactful articles that have steered our specialty, and is well recognized as one of the founding fathers of breast imaging. Today he is professor of radiology and chief of breast imaging at the University of California, Irvine. I had the incredible pleasure to speak with Dr Feig recently.

MZ: What are your thoughts on the progression of the society?

SF: The SBI was born in a Howard Johnson's restaurant in Boston. Mark Homer suggested we create a fellows' society. At that time, most other radiology subspecialties had a society and we anticipated the need for SBI, like a startup company sees a future need. Mike Moskowitz said early on that breast imagers should not just be film readers. That was a critical reason that our specialty evolved differently than the rest of radiology. When the membership was expanded beyond fellows, the society really began to grow. Now it is wonderful to see how strong it is and how it has grown.

Stephen Feig, MD, FACR, FSBI

Is there anything you would like to see that hasn't come to fruition yet?

Even though much progress has been made, we still have a lot of work to continue to promote screening and its importance in saving lives. The End the Confusion campaign is wonderful, but it only offers the reasons to promote mammography. It should be expanded to refute unjustified criticisms such as radiation risk and overdiagnosis as well as have a Q&A section for referring clinicians and for patients.

You were all relatively young when establishing the society. What advice do you have for young professionals?

Focus on what you want to do, what you want to be known for, and play to your strengths. Find a niche, whether that be as a speaker, researcher, teacher; we need all types. Also, be flexible to make moves if it improves your career. Louis Pasteur said, "Chance favors the prepared mind." This phrase hung beneath a mural picturing the history of science in the lobby of the Bronx High School of Science, where I spent 4 formative years, and I always embraced it. These are words to live by.

In hindsight, is there anything you would do differently?

I was always dedicated, persistent, and focused. This can lead to frustration with some of your coworkers and your chairs who may have other ideas. I occasionally went overboard and took on too much.

What is your most memorable experience, meeting, moment, time, etc (as it relates to SBI)?

Getting to know my fellow breast imagers at the meetings. That pulled us all together and was wonderful.

What 1 word would you use to sum up SBI in 1985; 1 word to sum up SBI in 2020?

In 1985, amazing potential; in 2020, much accomplished yet much remaining potential.

What leadership advice would you offer for future SBI board members?

Continue to have the society's needs be the main priority. Personal issues and agendas should be held aside. Each leader should distinguish their own self-interest from that of the society.

Interview: SBI Founding Member Marc J. Homer, MD, FACR, FSBI

By Jay Baker, MD, FACR, FSBI

Jay A. Baker, MD, FACR, FSBI

Only 6 radiologists have been with SBI since the start, and few have had as large an impact on breast imaging education as Marc J. Homer, MD, FACR, FSBI. Marc's legacy in the field includes a widely used repositionable localization device, the Homer needle; a series of important breast imaging courses taught over decades; and a highly acclaimed book, *Mammographic Interpretation: A Practical Approach*. Marc kindly shared some of the memories of his long and storied career along with important lessons learned.

JB: What was the original intent of the society when the 6 of you decided to found it in 1985, and how did it actually come into being?

MH: The 6 founders were all academically oriented, and we all shared a similar focus on learning. There was a tremendous need early on for better training, so the 6 of us traveled around the country teaching hundreds of radiologists how to interpret mammograms. We quickly realized the importance of the role of the technologists and expanded the workshops to include them.

The 6 of us were at a restaurant in Boston one evening when one of us—no one is quite sure who, but it may have been me—said, "Why don't we form a society?" All 6 of us pulled out our checkbooks and wrote personal checks to start the treasury. I won the lottery and was named the first president of the new society. Our primary focus was on educating other radiologists, and as a little group of teachers, we wanted to elevate the field of breast imaging and bring mammography and breast biopsies to the national stage.

What was your biggest challenge as president of the new society?

My biggest challenge as the first president of the SBI during my 4-year tenure was getting breast imagers with different opinions to agree to be together. In the early days of breast imaging, there were many controversies, such as whether film mammography or xeroradiography was better in the detection of breast cancer, whether light scanning should be used, whether thermography should be used, and whether Wolfe parenchymal patterns had any validity, to name a few. The controversies were often so intense that some radiologists in one camp might not even speak to those in the opposing camp. I remember that a radiologist who was invited to join the society sent me a letter saying that because another person in an opposing camp was in the society, he refused even to be in the same room as the other person! It was important to me to help members understand that people may have different opinions about things and the society is the forum for us to discuss them.

Do you have a guiding principle, and if so, what is it?

I do have a guiding principle: assume nothing, trust no one. Our patients were often in denial about the lump they felt, and referring doctors routinely gave us bad clinical histories. So assume the patient and the primary care physician aren't telling the truth. Ask your own questions. Find out the truth for yourself.

What was your greatest source of strength?

As a section chief, I never made a decision without talking to everyone who would be affected by that decision. I spoke to every physician and every technologist. As a leader, it's important to be collaborative. When you finally make a decision, if everyone is a little unhappy, then you have likely made the decision without showing favoritism, and it's probably the right call.

What is the thing you are most proud of in your professional and personal life?

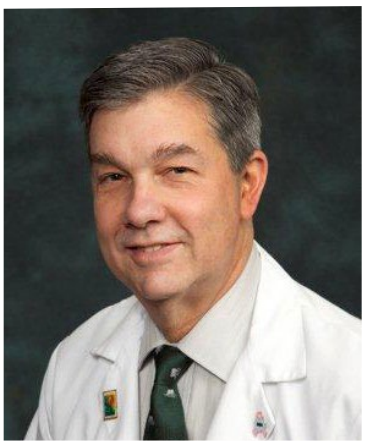
Professionally, I am most proud of teaching breast imaging to hundreds of radiologists. I used to go around the country giving 3-day courses on breast imaging by myself. Instead of going to the usual places, I went to cities where people didn't usually go to lecture. I went to places like Fargo, North Dakota; Vineland, New Jersey; Oakwood, Michigan; and Buffalo, New York, because I wanted to go where radiologists needed to hear the information.

I am also proud to be in a profession in which I was able to form close bonds with my patients, many of whom would let only me read their mammograms over the years. About 20 of my patients actually attended my retirement party.

On a personal basis, I am most proud of my 2 sons. Ross is an executive with a marketing and communications firm, and my youngest, Seth, is a practicing gastroenterologist. Who could ask for anything more than to be proud of their children?

What is the most important part of your life outside of medicine?

My grandchildren. My granddaughters are Shayna, who is 5, and Alana, who is 8. This answer is obvious to anyone who is a grandparent but is difficult to explain to anyone who isn't. There is a saying that sums it up: "Grandchildren are God's gift to parents."



Marc J. Homer, MD, FACR, FSBI

What is 1 word you would use to sum up SBI in 1985? And what 1 word would you use in 2020?

The word I would use to sum up SBI in 1985 is *foresight*. The founders and initial members recognized the importance of early detection of breast cancer and the need for radiologists to step up to that challenge.

In 2020, the word I would use is *forefront*. SBI is in the forefront of everything to do with breast imaging, from education to research to the journal to international outreach to legislative efforts.

When you think about how SBI has evolved over the past 35 years, is there anything you would have liked to see the society do that hasn't come to fruition yet?

Honestly, no. I am in awe of the evolution of SBI. When you consider what the society has accomplished, I simply could not have envisioned those things when we started in 1985.

If you could do it all over again, what would you change and why?

Nothing. I absolutely would not change a thing. I have been so very lucky in my life and career, that I wouldn't change anything. Not many people can say that, but I'm one of the lucky few.

Interview: SBI Founding Member Harold Moskowitz, MD, FACR, FSBI

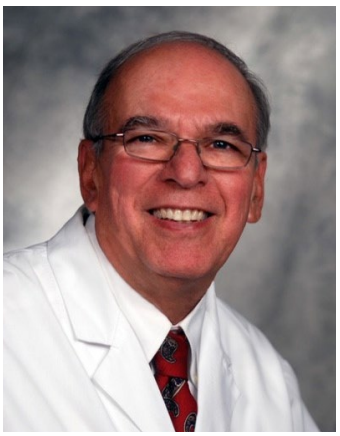
By Wendy DeMartini, MD, FSBI

Wendy DeMartini, MD, FSBI

It was an honor to recently speak to Dr Harold Moskowitz, one of the 6 founding members of the SBI, in honor of the 35th anniversary of our society.

WD: Tell me a bit about your story in becoming a breast imager and in founding the SBI.

HM: In late 1961, one morning as a young radiology resident I was told, "Moskowitz, you're going to learn and do our mammography." My response was "What's that?" I was told it was x-raying the breast and was sent to learn how to do it. After finishing my training and a stint in the army, I returned to New York working at Downstate Medical Center, directing the angiography laboratory. One day, I saw an advertisement seeking radiologists to read mammograms for the Health Insurance Plan of New York randomized controlled screening trial. I would stop on my way home after work and interpret mammograms for the trial. Several years later, I moved to Connecticut to head a radiology department in a community hospital and to teach at the new medical school at the University of Connecticut. I decided to offer mammograms in my clinical practice. The Sisterhood of the hospital raised funds for me to purchase one of the first film-screen mammogram units in the United States. We were performing mammograms from 6 AM to midnight.



Harold Moskowitz, MD, FACR, FSBI

From the beginning, I was focused on mammography quality and standards. When I was president of the Connecticut Radiology Society, we established state standards that were precursors to the Mammography Quality Standards Act of 1992. With the other founding members, we began offering national teaching conferences, and we recognized the need for a subspecialty mammography society with education and quality as its foundation.

What are your thoughts on the progression of the SBI?

I am very proud of what has transpired. The SBI is a true community. It remains dedicated to teaching, quality, and standards. It continues to change and improve the field of breast imaging.

Is there anything you would like the SBI to accomplish that hasn't come to fruition yet?

Continue to push the frontiers of our field. Mammography is our solid base, and we should build upon it with newer technologies.

What are some of your best memories of the SBI?

The enthusiastic responses of the founding members when we discussed starting the society: "Let's do it!" Getting the technologists involved as part of the society. The strong sense of community and family. And many joyous dinners after meetings.

What is 1 word to sum up the SBI in 1985, and 1 word to sum up the SBI in 2020?

1985, promise; 2020, success.

What do you see as continued opportunities in the field?

We should continue to improve our diagnostic performance, including predicting the potential relevance and aggressiveness of findings. We should work to meet with and talk to most of our patients, to be an active and crucial part of the health care team. We should embrace new technologies that add value.

Thank you so much for your time, for being a pioneer in breast imaging, and for founding this incredibly important society.

Good luck, and I would love to continue to support the SBI in any way I can.

Interview: SBI Founding Member Myron Moskowitz, MD, FACR, FSBI

By Elizabeth Morris, MD, FACR, FSBI, FISMRM

Elizabeth A. Morris, MD, FACR, FSBI, FISMRM

I had the distinct pleasure of talking to Myron Moskowitz by phone in his home in Cincinnati, Ohio. First things first: Myron and Harold Moskowitz, 2 of the 6 founding fellows, are not related. Harold has "my name" and speaks with a Brooklyn accent, says Myron jokingly. Myron was there at the beginning but modestly credits Harold and Mark "Knockahomer" (also known as Homer) as major drivers of the founding of SBI. At the time, the founders wanted to raise interest among other radiologists in breast imaging, provide training for the future, and test new modalities. Screening was their passion.

Dr Myron Moskowitz grew up in Cincinnati and as a kid lived around the corner from Jewish Hospital. It was very modern because it had elevators with buttons! They were great for kids to play with on weekends until they got caught. He had relatives who were dedicated physicians. He was going to be an internist, but one day when he was finishing his first year as a medical resident at the University of Cincinnati (UC), he was reviewing a case at the Veterans Administration hospital with a neuroradiologist and said, "Gee, radiology is interesting!" Two days later he had a call from Benny Felson (a "living legend in radiology"), director of radiology at UC. In short order Dr Felson convinced him to go into radiology. "He said he would take care of things with the chairman of the department of medicine, where I had already been accepted for the second year...not to worry. He was a huge influence on my career."

Traditional medicine at that time was built on the case model. Dr Moskowitz was interested in more than just cases and over time became interested in breast screening "as it made us more involved with the scientific method and so it became a passion.... Performing science and studying the benefit and value of what we were doing at the time was what drove us." In 1974, Dr Moskowitz reported results of screening mammography performed at the Cincinnati center of the Breast Cancer Detection Demonstration Project. He updated the results in 1976 and concentrated on finding minimal breast cancer. According to the publication, Moskowitz stated that "it is the responsibility of the radiologist to seek out indirect signs of minimal breast cancer and indicate to the attending physician how strongly or weakly these signs are associated with an underlying small carcinoma." He was "a staunch advocate of aggressive screening" to increase detection of early cancers and showed that it can be associated with a favorable cost-benefit ratio.[1] "We did a paper on what happened after we stopped screening, and if you stop screening the rate of increased stage jumped up in a short period of time, confirming screening controls advanced disease," he said. Today he says, "We are still battling screening. The basic problem remains the same. As with the pandemic, we are seeing that some people don't want to accept science."

Myron Moskowitz, MD, FACR, FSBI

Dr Moskowitz has remained in Cincinnati, retiring 15 years ago. When asked about his legacy and the highlight of his career, he said is most proud of establishing screening in general and specifically of screening women under age 50 years. He states that women in their 40s are surviving better with screening and treatment but that the appropriate study proving that screening is the prime reason for this improvement hasn't been done and probably will never be done.

He and his wife go to a community center and work out in the gym 3 to 4 times a week. He walks, swims, and does resistance training. He is a retired serious biker who used to bike 50 to 80 miles a day in his 60s with weekend tours up to Lebanon. He dotes on his 5 grandchildren: a grandson who is a lawyer in New York City, a grandson in theater management, a granddaughter working for the Bill & Melinda Gates Foundation, a grandson who works in fund-raising for a nongovernmental organization in Washington, DC, and a grandson who is an entertainer and performs on cruise ships. Not to be overlooked are 2 adorable great-granddaughters who are toddling on their way.

Dr Moskowitz has found it easy to retire, not surprisingly, as he remains active and engaged away from UC. He states that he had fun at UC and was able to do great, rewarding work but that there are always responsibilities that go along with work. He was able to walk away from it. He advises, "Don't let your work define you; you will be disappointed." His motto in life is "Have a good time!"

The worst advice he received was from his mentor Benny Felson. Dr Moskowitz was a pioneer and visionary thinker in pattern digitization and pattern recognition way before we had the computing capabilities that we have today. Dr Felson advised him, "Don't get lost in the esophagus, and nothing will come from pattern recognition." He may have been right about the esophagus, but he missed the mark on pattern recognition. Even legends can sometimes not see the future. One imagines what Dr Moskowitz would have accomplished had he had access to the computing power and analytic tools that we use today for artificial intelligence and pattern recognition.

Overly humble, saying he really can't give advice, Dr Moskowitz says he is happy that he chose radiology because he was able to do real science and contribute through research. He thinks that radiology is still a good place to be, with fantastic new developments and growth still before us. It is good to remember, however, that "what is good is not necessarily new and what is new is not necessarily good." Maintain a healthy skepticism and challenge everything.

Reference

1. Gold RH, Bassett LW, Widoff BE. Highlights from the history of mammography. *Radiographics*. 1990;10(6):1111-1131. doi: 10.1148/radiographics.10.6.2259767

Interview: SBI Founding Member Edward Sickles, MD, FACR, FSBI

By Jessica Leung, MD, FACR, FSBI

Jessica Leung, MD, FACR, FSBI

Dr Edward A. Sickles is a world traveler and a true citizen of the world, having taught breast imaging in 50 states, 33 countries, and 6 continents. Born, raised, and educated in New York City (at Columbia University and Cornell Medical School), Dr Sickles spent his entire academic radiology career, over 40 years, at the University of California, San Francisco (UCSF). His impact in breast imaging is wide, encompassing, and varied, including patient care, practice management, national and international standards and guidelines, evidence-based investigative approaches, and education/training. In addition to being one of the 6 founders of the SBI, he served as SBI president (1989-1990) and received the honor of SBI Gold Medal (1999). Nearly all of us know him from his innumerable practice-setting publications and unforgettable lectures. I have had the distinct honor and fortune of having learned from and been mentored by him as his radiology resident, breast imaging fellow, and junior staff attending physician. I interviewed him for this newsletter in 2016. It is my privilege to speak with him again for this article celebrating the 35th anniversary of the founding of the SBI.

Although he is officially retired, Dr Sickles continues to perform 20% clinical work (through telemammography technology during the coronavirus disease 2019 [COVID-19] pandemic) and education in various forms. His publications, lectures, awards, and honors are too many to count. One of the most lasting aspects of his legacy is his training of generations of breast imagers, including myself. He continues to enjoy retirement with his medical school sweetheart/pediatrician wife, Dale, in their house on a hill overlooking the beautiful San Francisco Bay, with views of both the Golden Gate and Richmond Bridges. Despite the current California wildfires, which on some days obscure the view from his top-floor deck, he is happy, balanced, and optimistic.

JL: Founding a new society—what a great idea! How did the idea come about?

ES: As I recall, Marc Homer came up with the idea. You need to keep in mind that when the society was founded, breast imaging was in its infancy. Mammography was not part of the ABR [American Board of Radiology] boards, and training in mammography was not required in residency. There were no requirements for CME in mammography. We [the founders] were friends who shared a common vision: to alleviate breast cancer morbidity and mortality through breast imaging. To achieve that, all of us felt that proper education and training in breast imaging were necessary. So we got together in a restaurant in Boston one spring in 1985 to talk about forming a breast imaging society. And that's how the SBI started.

Edward Sickles, MD, FACR, FSBI

All the founders were relatively young when the SBI was established. What advice do you have for young, academically inclined professionals these days?

Young in 1985 was very different than young in 2020. In 1985 the field of breast imaging was new, with numerous avenues of clinical and research investigation wide open to study. Also, many clinical practice approaches were just being developed. Young professionals now have to think harder and work harder to make names for themselves because there is much less "new."

What is your most memorable experience in the SBI over the years?

Too many to choose only one. Here are some examples. (1) Expanding the society from limited membership by invitation to its [current] status (existing members became fellows [and] a large general membership was added): this happened when I was president and is my most important contribution to the society. (2) The first SBI meeting at Amelia Island, Florida, in 1993, which established the SBI as a truly national society and helped greatly in expanding the general membership. (3) The several more recent and innovative SBI outreach programs, such as those involving societies from other countries.

What are your proudest achievements in breast imaging?

I was fortunate to have been in the right place at the right time. Mammography was not widely used; the Swedish trials on screening mammography were not yet published. UCSF was a great place to build an academic career. My chair, Alex Margulis, offered me unparalleled opportunities to do research and publish by assigning me to very limited clinical responsibilities. In the 1980s, there was a small start-up company in the nearby Silicon Valley which produced experimental x-ray tubes that ended up being the basis of magnification mammography. So I had the opportunity to develop spot-compression magnification mammography, which I believe helped to propel mammography into the clinically vital tool that it is now. Shortly after that, I was able to publish our experience on the use of what later became the BI-RADS 3 *probably benign* assessment. Other investigators were also publishing on the topic, but the UCSF experience was the largest. As you know, the BI-RADS 3 *probably benign* assessment category since has been validated worldwide over many years. More recently, it has even been incorporated into the lexicon and management of several other ACR Reporting and Data Systems. So to answer your question: (1) magnification mammography and (2) the BI-RADS 3 *probably benign* assessment. Of course, there also is (3) the privilege of having taught not only many of the current leaders in breast imaging but also, via postgraduate courses and conferences, most of the breast imagers who now practice in the United States.

Continued on page 13 >

SBI Committee Updates

By Yasmeen J. Fields, CAE

SBI committees were hard at work over the summer developing new member resources and e-learning opportunities and presenting live webinars. Read on for committee updates and activities.

Yasmeen J. Fields, CAE

The **CME & SAM Committee** continues to create engaging online educational tools for members and nonmembers. The latest program release showcases breast magnetic resonance imaging (MRI) and digital breast tomosynthesis (DBT) presentations from SBI's Symposium Collection. These collections are designed to enhance a learner's breast imaging interpretation skills through a series of 4 breast MRI–focused and 4 DBT-focused presentations from SBI symposia. Participants can earn up to 8 AMA PRA Category 1 Credits™ or 8 Category A credits.

The **Fellowship Match Committee** held its quarterly meeting on May 14, 2020, to discuss the 2020 and 2021 National Resident Matching Program Fellowship Match. The 2020 Match was another success; 82 fellowship programs participated and 124 applicants matched. Because of widespread demand, there will be a set application period for the 2021 Match, beginning August 1, 2020. Virtual interviews are encouraged given the travel constraints due to the coronavirus disease 2019 (COVID-19) pandemic. The Fellowship Match Committee and the Resident and Fellow Section (RFS) Committee have jointly developed a guide for the Fellowship Match, including a timeline for applicants and tips for virtual interviews. The committee is also discussing the potential use of a standardized letter of recommendation for applicants to request of their program directors. The 2020 Match Survey was deployed to residents who participated in this year's Match, and results will be shared with all programs and published in the *Journal of Breast Imaging*.

The **RFS Committee**, along with the Fellowship Match Committee, created a Fellowship Match applicant guide that will be shared with members and uploaded to the RFS web page. The committee also expanded their social media outreach with a 2020 Match promotion on Twitter in which they asked applicants to share their #Mammo-Match stories. This campaign was very well received and allowed residents to share their inspiration for joining the breast imaging specialty. Finally, RFS e-Learning Resources were published as an educational tool for members in training. This YouTube playlist is an extensive collection of previous lectures from SBI symposia and includes talks on early-career success tools, procedures and interventions, advocacy, case review, and updates on breast imaging.

The **Inclusion Diversity Equity Alliance (IDEA)** held its inaugural meeting on June 23, 2020, to formulate a strategy for 2020 and 2021. Even before their inaugural meeting, IDEA was engaged and working on behalf of the SBI. On June 2, 2020, weeks before the initial meeting, IDEA released its first statement in response to the continued racial injustice plaguing our communities. Through IDEA's efforts, SBI met the moment while standing in solidarity with colleagues, patients, and the greater radiology community to advocate for inclusion, diversity, and equity for all. In the coming weeks, IDEA will survey SBI members to better understand the society's demographics, interests, and needs to guide their work.

The new **Mentorship Committee** has been developing an official SBI Mentor Match program, which is set to debut in 2021. Led by chair Laurie Margolies, MD, FSBI, the Mentorship Committee has worked to develop a mentor match interest survey, a curriculum for potential mentors and mentees, and an outcome survey, among other projects. The committee will continue its work into the fall season, collaborating with the Young Physician Section (YPS) Committee and the IDEA to ensure that the program attracts a diverse applicant pool.

The **Nominating Committee** will be meeting this fall to discuss the 2 new open positions on the SBI Board of Directors. Dr Paula Gordon, serving as secretary-treasurer, and Dr Margarita Zuley, serving as immediate past president, will both rotate off the board in April 2021. To be eligible to serve on the Board of Directors, one must be an SBI Fellow.

The **Patient Care and Delivery Committee** has 14 exceptionally proactive and diverse members. The committee is actively engaged in a wide range of topics aimed at understanding the practice needs of breast radiologists. In collaboration with the National Consortium of Breast Centers (NCBC), the committee has twice surveyed the combined membership of the SBI and the NCBC about COVID-19. Committee members are seeking to understand the clinical, educational, financial, and emotional impact that COVID-19 has had on the combined membership and plan to share these results in the near future. A forthcoming survey will ask how breast imaging practices approach the imaging of transgender patients because of the unique challenges with this important patient population. Also in development is a review of evidence-based practices for preoperative staging of the axilla, with a focus on changes resulting from the Z0011 and Z1071 trials. The committee is always receptive to new project ideas and collaborations. Mary Scott Soo, MD, FSBI, and Stamatia Destounis, MD, FACR, FSBI, hosted a 2-part series on patient communication offering 1 AMA/PRA Credit each that is available for free to all members.

The **Social Media Committee** (#SoMe Committee) launched the #SBISummerSeries on June 15, 2020, in an effort to engage members with lively and informative discussions around relevant topics. Over the course of 8 weeks, discussions included returning to screening during the COVID-19 pandemic and how to successfully transition from fellow to attending physician. There was also a

special series of discussions specifically to address the challenges and upcoming changes for those entering or considering fellowship. The #SBISummerSeries was well received by members and "friends," with weekly participants from all over the globe.

The **YPS Committee**, led by cochairs Amy Patel, MD, and Naziya Samreen, MD, has been focused on creating resources to engage, retain, and grow the postfellowship/early-career physician membership base. Of particular importance is developing content for a YPS member web page and associated community on SBI Connect. Moreover, as the primary cohort for potential mentees, the YPS Committee will work closely with the Mentorship Committee to launch the Mentor Match program.

We are grateful to all of our committee members for their continued hard work and dedication to the society's mission and goals!

President's Column (continued from page 3)

Rather than achievements, the new word of the day is *resilience*, which is really an achievement in and of itself. To share an example of resilience: when Past President and SBI Gold Medalist Dr Carol Lee delivered a RFS webinar lecture on BI-RADS this August, her electrical power was knocked out by Hurricane Isaias, but she nevertheless persevered and delivered the lecture by relying on her backup generator! Together and united as a society, we are resilient and strong. We understand that these are trying times, so the Board has decided to hold off on the increase in membership dues that was scheduled for 2021.

To quote Nick Jonas in my conclusion: "Life happens. Adapt. Embrace change and make the most of everything that comes your way." Especially in October, Breast Cancer Awareness Month, please help educate our patients that it is safe to return to screening as we have taken precautions against COVID-19. Thank you sincerely for the opportunity to serve.

Jessica Leung, MD, FACR, FSBI
President, Society of Breast Imaging

Interview: SBI Founding Member Edward Sickles, MD, FACR, FSBI (continued from page 11)

One word to sum up the SBI in 1985; 1 word to sum up the SBI in 2020?

1985, fledgling; 2020, COVID (hopefully an aberration).

Diversity and inclusion are also ever-so-important concepts in 2020. Can you comment on this?

Diversity is obviously important—a good thing in 1985, and a good thing now. Our country is built on diversity, even if there are elements in our society that are not as diverse as they should be ideally. I think it is important that organizations, be they health care, corporate, or government, should have programs and policies in promoting diversity. Let me give you an example. When I went to Stuyvesant [in Manhattan] for high school, the school was all boys. Meanwhile, Bronx High School of Science, which is another magnet school in the New York City public school system, accepted girls and boys. I always thought that Bronx Science had more to offer because of all the great students who were boys AND all the great students who were girls. Admission to both schools was by merit, so the girls admitted to Bronx Science were more qualified than the lower half of the class at Stuyvesant (an important advantage of diversity). But I lived in Manhattan, not the Bronx, and Stuyvesant High School happened to be 1 block away from where I lived. And here is a fun fact: Stephen Feig [another founder and past president of the SBI] and Ellen Mendelson [who also contributed so much to breast imaging] both went to Bronx Science.

What leadership advice would you offer for future SBI board members?

Although it is important to address current breast imaging issues directly and forcefully, it is especially important to plan for the future. Anticipate future developments so as to have established policies and practices in place that can be endorsed by other societies or even co-opted by government agencies (such as the FDA [Food and Drug Administration]).

Knowing you as well as I do, I would say that discipline and organization are some of the secrets of your professional success. What other advice would you offer?

Be flexible in your ideas, including the ones you have already published. Because as time advances, and as technology progresses, prior ideas may be eclipsed. You must be flexible enough to let them go and to adapt. If you are inflexible, then you become irrelevant. I saw this happen with xeroradiography several decades ago. I see artificial intelligence as helping humans (including breast imagers) to increasingly make more informed decisions in the future. Perhaps not in my lifetime, but if it does, I will be ready!

What are some of the best decisions you have made in your life?

Marrying my wife is my best single decision. Other good decisions: pursuing an academic career in breast imaging, buying my house in San Francisco at about 1/40 of its current value, and partially retiring from practice at the time and in the manner that I did.

When I interviewed you for this newsletter in 2016, I shared that you flew 3 million miles on United Airlines and achieved the elite status of 1K member for life. In the setting of the COVID-19 pandemic and restrictions on travel, what are you doing for fun?

My last travel was in March 2020 to teach at a UCSF CME course in Hawaii. I definitely miss travel a lot—I miss meeting with my friends and teaching people from all over the world. I miss travel for pleasure. But I have the good fortune of living in the San Francisco Bay area, which is truly one of the most beautiful places on Earth. I take lots of long walks with my wife, which is an outdoor activity allowed by local ordinances despite COVID restrictions. Like most people who mostly stay at home during this time, I have been reading a lot and watching TV: fiction, nonfiction, all genres, including international series. I likely will not travel again, at least via air, until there is a vaccine. Being older, I feel more "cheated" by this pandemic than a younger person since the same amount of time lost to COVID translates into a greater percentage loss for me. Nevertheless, I think it is really important that we take things in stride. I especially look forward to the time when my wife and I can travel again to cultural cities around the world to visit museums, enjoy opera, and have great dinners, as well as to travel again to more remote locations where we can more extensively enjoy our interest in bird watching!

☆ SUMMER 2020 NEW SBI FELLOWS

The Fellows Committee recently approved 3 outstanding new SBI fellows. This distinction is among the highest honors bestowed on SBI members.

Fernando Collado-Mesa, MD, FSBI

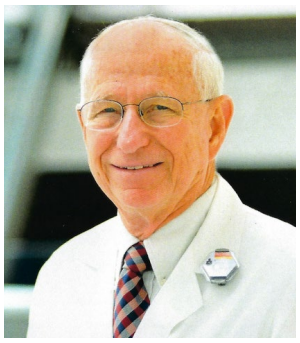
Fernando Collado-Mesa, MD, FSBI, is associate professor of radiology at University of Miami Miller School of Medicine and medical director of the Breast Health Center at Jackson Memorial Hospital, Miami, Florida. He received his medical degree from the University of Medical Sciences, Havana, Cuba, and completed a residency in medical epidemiology at the National School of Public Health, Havana. Dr Collado-Mesa is a former Pan American Health Organization, Academic Visitor, and public health research fellow at the Department of Epidemiology and Public Health, University College London, England.

After migrating to the United States, he completed a residency in diagnostic radiology at Louisiana State University Health Sciences Center, New Orleans, and at University of South Florida Morsani College of Medicine, Tampa. He completed a breast imaging fellowship at Mount Sinai Medical Center, Miami Beach, Florida. Dr Collado-Mesa is a member of the ACR Economics Committee on Breast Imaging and has participated, presented, and lectured at numerous state, national, and international meetings. He is the author of numerous publications. His research interests include artificial intelligence in diagnostic radiology, and he is chief of Radiology Informatics for Artificial Intelligence in the Department of Radiology, University of Miami Miller School of Medicine. He is passionate about teaching and is associate director of the radiology residency program at the University of Miami Miller School of Medicine and Jackson Memorial Hospital.

Dr Collado-Mesa enjoys sports and plays soccer with residents and fellows. He is an avid reader, enjoys music and movies, and likes to travel with his family. He lives in Miami Beach with Cindy, his wife of 21 years, and their daughter, Amanda (18). His son, Fernando Javier (29), currently lives and works in Chile.

Jiyon Lee, MD, FACR, FSBI

Jiyon Lee, MD, FACR, FSBI, is clinical professor of radiology at New York University School of Medicine, New York. Her educational background includes Yale College and Yale University School of Medicine, New Haven, Connecticut. She completed her surgery internship and diagnostic radiology residency at Columbia University College of Physicians and Surgeons and New York-Presbyterian Hospital/Columbia, New York, where she also completed her women's imaging fellowship. Dr Lee lectures widely in the United States and internationally on breast imaging topics including detection of breast cancer and other breast conditions. Her diverse research interests and published works focus on optimizing the patient and provider experience and on radiology education, particularly on providing proactive, effective, and practical education of radiologists, other health care providers, patients, and the lay public in any useful setting. Her friendly and interactive public education offerings within various community and corporate settings make breast radiology relevant and understandable. Demystifying hot topics, explaining choices, encouraging balanced ongoing learning, and empowering shared decision-making are among her passionate goals with community partners. Dr Lee's nonprofit work includes the American Cancer Society, Tigerlily Foundation, and Gilda's Club New York City.



Alfred B. Watson Jr, MD, MPH, FACR, FSBI, FACPM

Alfred B. Watson Jr, MD, MPH, FACR, FSBI, FACPM, is distinguished emeritus professor of radiology at Baylor College of Medicine in Houston, Texas. Dr Watson says, "When I look back on my 52 years in medicine, 38 in diagnostic radiology with specialization in breast imaging, I can say with all sincerity that choosing radiology and breast imaging was the second wisest decision I ever made. Marrying my wife, Barbara, was the wisest. These years mentoring hundreds of medical students, radiology residents, and breast imaging fellows have been greatly fulfilling and a joy; they have kept me young and active. I also devoted time to mentoring faculty so they could publish and be promoted. The second part of my career was dedicated to taking care of the USAF [US Air Force] military families and the indigent patients of Harris County, Texas. I devoted my time to these wonderful patients by providing quality and timely patient care in a professional and ethical environment. My life has been blessed because of those I have been associated with and the thousands of grateful patients I cared for over the past half-century. I thank the SBI Fellows Committee for allowing me to be a fellow through the waiver of 15 publication points."

The SBI Newsletter Committee is excited to provide interesting cases for our members. Our hope is that interesting cases will illustrate 1 or more valuable teaching points for a scenario or combination of findings that may emerge in any type of daily practice. We are happy to accept an interesting case from any individual or group. The description of a single extremely rare entity (case report) is discouraged unless there is an important aspect to the work-up, imaging, or clinical picture that merits discussion and can be more widely applied. Please contact Amanda Lenderink-Carpenter, MD, for questions or submissions at alenderink@gmail.com.

Interesting Case:
Cyst Gone Rogue?

By Suruchi Dewoolkar, DO; Nidhi Sharma, MD

Suruchi Dewoolkar, DO

Nidhi Sharma, MD

A 64-year-old woman was recalled from screening for evaluation of a focal asymmetry in the upper outer quadrant of the breast (Figure 1). Diagnostic images confirmed persistence of the finding seen on screening mammography. Subsequent targeted ultrasonography demonstrated a cyst with thin septation (Figure 2). This finding was deemed benign. The patient returned a month later with focal breast pain and a palpable abnormality. Repeat right breast targeted ultrasonography confirmed that the previously identified cyst correlated with the area of clinical concern. Therapeutic aspiration was performed for the symptomatic cyst (Figure 3). Postaspiration imaging demonstrated complete collapse of the complicated cyst. No biopsy clip was placed. How would you interpret this examination?

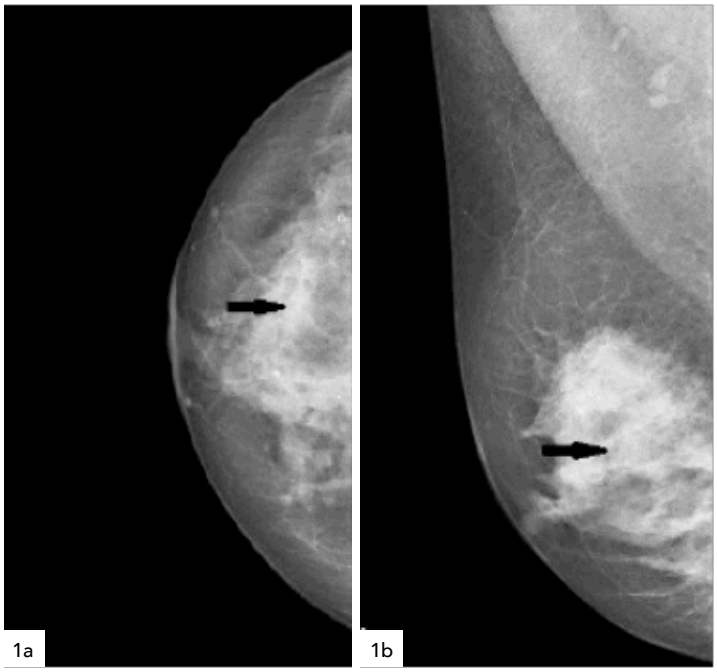
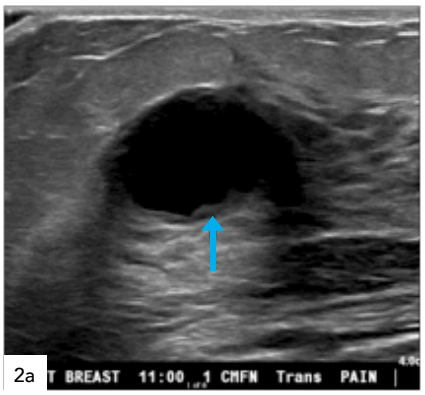


Figure 1. The right craniocaudal (a) and mediolateral oblique (b) views from the screening mammogram show a focal asymmetry (arrows) in the upper outer breast.



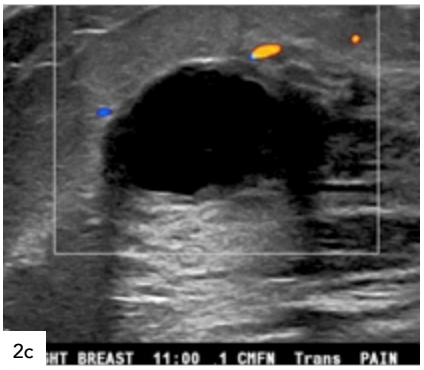


Figure 2. The right breast targeted ultrasound transverse (a) and sagittal (b) images depict an oval, anechoic, circumscribed mass with posterior acoustic enhancement, minimal wall thickening (blue arrow), no associated vascularity (c), and thin internal septation (white arrow). The mass is located at the 11-o'clock position 1 cm from the nipple. During the ultrasound examination, the patient described focal pain at this site.

Continued on page 16 >

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Figure 3. The targeted ultrasound transverse preaspiration image of the right breast shows a stable, oval, anechoic, circumscribed mass with posterior acoustic enhancement and layering debris (arrow) at the palpable site with focal pain. No associated vascularity was noted (not shown).

The aspirated fluid was nonbloody and yellow and was submitted for cytologic evaluation. Pathologic analysis demonstrated numerous large malignant cells in cohesive clusters and as single cells, consistent with a high-grade carcinoma. Targeted sonographic evaluation was performed for reevaluation of the aspirated area because a marker clip was not placed at the time of the aspiration. Ultrasonography demonstrated reaccumulation of the cystic contents less than 2 weeks after the aspiration (Figure 4). Ultrasound-guided core biopsy was performed through the cyst wall for tissue diagnosis (Figure 5) and revealed high-grade, triple-negative invasive ductal carcinoma and ductal carcinoma in situ with high nuclear grade and suspicion for lymphovascular space invasion. Postclip mammography revealed the biopsy clip in the upper outer breast at the site of the mammographic focal asymmetry (Figure 6).

Contrast-enhanced magnetic resonance imaging was performed to evaluate extent of disease and for surgical planning. The magnetic resonance images (Figure 7) demonstrated a 5.5 × 5.5 × 4.5–cm complex solid and cystic mass at the 11-o'clock position in the right breast, corresponding to biopsy-proven cancer. This mass demonstrated a thick, enhancing rim with plateau and washout enhancement kinetics. The inner cystic area demonstrated mostly debris with septations.

4a 4b 4c

Figure 4. Ultrasound images (transverse [a], sagittal [b], and color flow [c]) of the right breast at the 11-o'clock position 1 cm from the nipple at the aspirated cyst site show reaccumulation of the cyst with layering internal debris. Concentric wall thickening with associated increased vascularity is consistent with a complex solid and cystic mass.

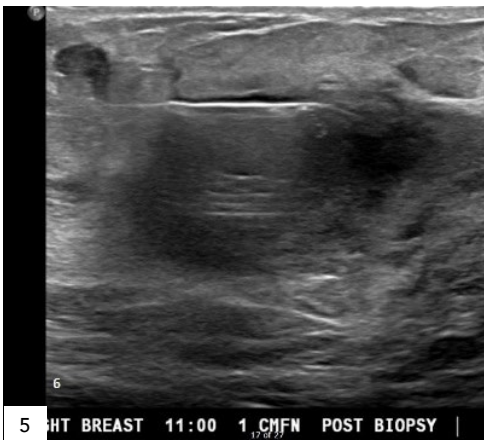

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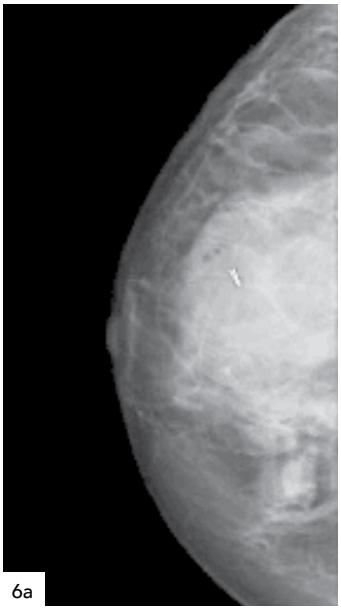
Figure 5. Ultrasound-guided core biopsy was performed through the thickened wall of the complex solid and cystic mass.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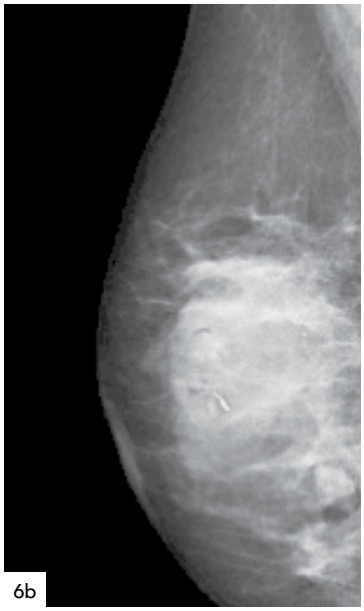
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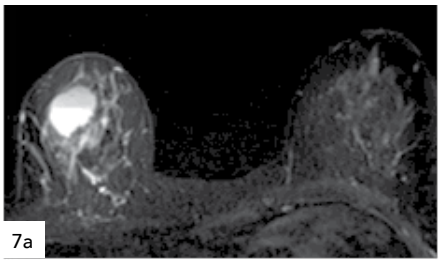
Figure 6. The postclip craniocaudal (a) and mediolateral (b) views show the clip at the biopsy site.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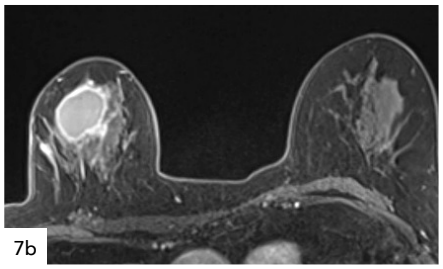
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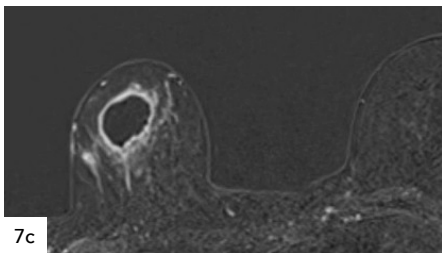
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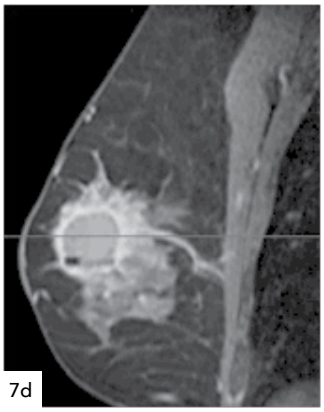
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Figure 7. Magnetic resonance images (axial STIR [a], axial postcontrast T1 fat suppressed [b], axial postcontrast T1 subtraction [c], and sagittal postcontrast T1 fat suppressed [d]) of the right breast show the rim-enhancing, complex solid and cystic mass. A biopsy clip susceptibility artifact is located along the anterior inferior wall on the sagittal view (d).

Because of the imaging appearance and the patient's history, this mass was initially interpreted as a complicated cyst with no suspicious features. The ultrasound-guided aspiration was performed for therapeutic purposes. Although the aspirated fluid was clear yellow, it was fortuitously submitted for pathologic evaluation, although in most instances such fluid is discarded after aspiration. Ultrasonography repeated after the receipt of pathology results of malignancy showed interval change in the appearance of the mass, with thickened walls and associated increased vascularity. Ultrasound-guided core biopsy of the suspicious thickened wall confirmed malignancy.

This case illustrates the challenging presentation of an estrogen receptor–negative, progesterone receptor–negative, ERBB2 (HER2)–negative cancer as a mass with benign features and a number of learning points. First, the relatively benign ultrasonographic features such as oval shape and thin septations may be misleading. No thickened wall, thick septation, or intracystic solid component was noted initially. Harmonics may be used to reduce false internal echoes. Spatial compounding improves evaluation of margins and decreases noise at the expense of posterior features.[1]

Second, the mass was interpreted on ultrasonography as a predominantly oval mass with mostly circumscribed margins. Close attention needs to be paid to the entire margin of the mass. Upon reevaluation, the posterior margin was thickened and indistinct. In malignant masses, the cystic portion can be due to central necrosis within a high-grade malignancy. Also, intracystic debris or a fluid-fluid level can be secondary to hemorrhage.[1] Low-grade malignancies are more likely than high-grade cancers to have spiculated margins.[2] The concern with a thick-walled cystic lesion is that it could represent a rapidly growing invasive carcinoma, which is most often a poorly differentiated (grade 3) invasive cancer. Medullary carcinoma can also have a similar imaging presentation.[3]

Typically, if a mass resolves after aspiration and yields nonbloody and nonpurulent fluid, the aspirate is discarded.[4] Fortunately, in this case the nonbloody fluid was submitted for pathologic analysis, and the imaging appearance showed more aggressive features on follow-up ultrasonography. Despite being an aggressive, high-grade, rapidly growing cancer, it had not spread to the lymph nodes. The patient underwent 4 cycles of neoadjuvant chemotherapy, followed by lumpectomy with sentinel lymph node biopsy and radiation therapy.

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Most Commonly Used Additional Views, Part 2:
Minimizing Superimposition and Identifying Location

By Robyn Hadley, RT(R)(M); Dawn Derenburger, RT(R)(M)

Robyn Hadley, RT(R)(M)

Dawn Derenburger, RT(R)(M)

Technologists should maintain a solid foundation of knowledge about supplemental images and their purpose. Part 1 of this 3-part series, "Variations of the Craniocaudal View," discussed additional views that can be obtained to maximize visualization of breast tissue in the axial or transverse plane. Those views included the exaggerated craniocaudal (CC) view and the cleavage view. In this article, we discuss options for verifying the location of an abnormality and counteracting superimposition of fibroglandular tissue.

Lateral View

The 90°, or straight, lateral projection can be an extremely useful tool. Mediolateral and lateromedial (LM) views are used to provide superior and inferior orientation to the nipple, visualize the 12-o'clock and 6-o'clock areas of the breast, and localize and evaluate milk of calcium. Lateral views are also alternatives for patients who cannot undergo imaging with the standard mediolateral oblique (MLO) view, such as patients in wheelchairs or on stretchers, patients with difficult body habitus (eg, pectus excavatum/carinatum, limited range of motion, etc), and those with encapsulated implants.

Although either lateral projection may be used, the LM view is recommended unless an area of concern is clearly seen in the lateral portion of the breast on the CC view, in which case it would be important to place the lateral breast closer to the image receptor (IR). Justifications for use of the LM view include the following[1]:

- The lateral mobile border of the breast can be used, thus facilitating positioning.
- The contralateral breast does not impede the movement of the compression paddle.
- The maximum amount of medial tissue will be imaged on the LM view if the edge of the IR is offset slightly toward the opposite side of the sternum with the IR pressing against the breast that is not being imaged.
- The LM view puts the medial aspect of the breast closest to the IR, showing the medial breast in greater detail. Positioning of the MLO view shows the lateral breast in better detail; therefore, the LM view can provide the radiologist with better clarification of the medial breast.
- Breast tissue that is missed on the MLO view is most likely in the deep medial posterior area. The LM view gives you a better opportunity to include this area when positioned as described above.

When considering which view to obtain, give careful thought to these points, established guidelines from the department's protocols, and the radiologist's requirements. Consider the following steps when obtaining a straight lateral projection:

1. Position the machine at a 90° angle.
2. The patient should face forward with the arm draped over the machine and the chin resting on the top of the IR. This facilitates relaxation of the pectoralis muscle, which makes positioning easier.
3. For the LM view, it is essential to properly place the IR on the midsternal line. The edge of the IR should be centered on the midsternal line so the width of the IR is pressing into the contralateral breast to assure visualization of deep posterior medial breast tissue (Figures 1 and 2).[1]
4. Pull the breast tissue onto the IR, holding the breast up and out upon compression.

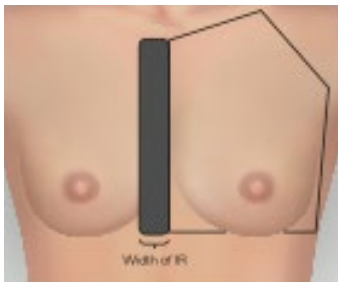

Figure 1. Proper placement of the IR on the midsternal line with the edge of the IR pressing into the contralateral breast.

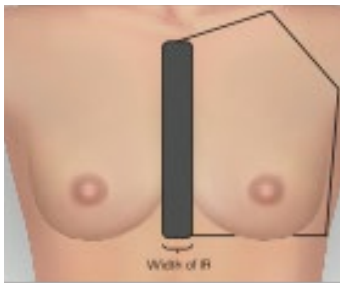

Figure 2. Improper placement of the IR on the midsternal line with the edge of the IR excluding posterior medial tissue.

Axillary Tail View

The axillary tail view is a supplemental view that isolates the axillary tail in an anteroposterior plane. This view is used only to provide focal compression of the axillary tail and will not provide true orientation to the nipple in the sagittal or axial plane. The edge of the IR is placed along the edge of the chest wall. The tail of the breast is placed under compression, visualizing only lateral tissue (Figure 3). Central tissue should not be included in the field of view (Figure 4). When performing the axillary tail view, technologists can employ the following steps:

1. Determine the angle of the machine on the basis of patient body habitus. The angle should be parallel to the axillary tail of the breast in the anteroposterior plane. The angle is generally 25° to 30°.
2. The patient's arm should be draped behind the top of the IR with the elbow bent and flexed.
3. Pull the axillary tail region of the breast away from the chest wall and onto the IR.
4. Hold the axillary region in place while applying compression.

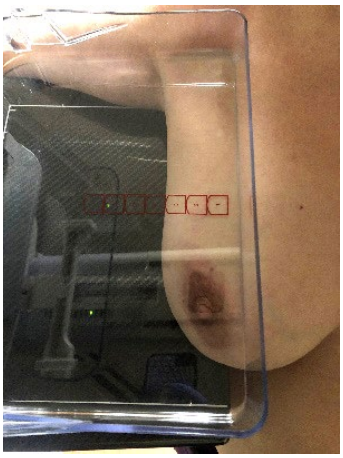

Figure 3. Proper positioning of the axillary tail view with the axillary tail region isolated.

Figure 4. Improper positioning of the axillary tail view with central tissues included.

Tangential Views

Tangential views can be used for 2 purposes: to verify the existence of dermal calcifications and to minimize superimposition of dense glandular tissue when imaging palpable abnormalities. Although digital breast tomosynthesis has decreased the need for tangential views, this technique is useful for placing dermal calcifications or a palpable abnormality over the subcutaneous fat, allowing visualization of the abnormality.[2]

Before the tangential view is obtained, skin localization must be performed to find the location of the suspected dermal calcifications or area of interest. Consider the following technique:

1. Review the CC and MLO screening views to determine in which quadrant the target is located.
2. Choose the appropriate view that will position the biopsy paddle closest to the area of concern (Figure 5).
3. Before positioning the patient, set the machine so the automatic compression release feature is off. The patient must remain in compression until the location is identified.
4. Using the fenestrated biopsy paddle with alphanumeric coordinates, position the fenestrated portion of the paddle over the approximate location of the calcifications. Be certain the proper skin surface is closest to the paddle window (Figure 5).
5. Take an exposure.
6. Using the alphanumeric coordinates, mark the location of the area of concern with a BB and release the compression (Figure 6).
7. Visualize an imaginary line from the BB to the nipple. Mound the breast tissue along this line with the nipple at one end and the marker at the other, placing the marker tangential to the x-ray beam (Figure 7).
8. Rotate the gantry so the IR is parallel to this line. The patient or the breast may also be turned or rotated to create the same alignment. This positioning is comparable to a nipple-in-profile view, but this approach demonstrates the BB in profile.

Figure 5. Breast localization map.

Figure 6. Fenestrated biopsy paddle with numeric coordinates used to localize the area of concern and a BB marker placed on the patient's skin.

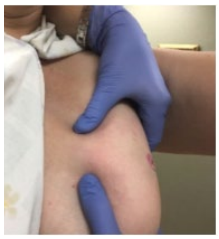

Figure 7. Breast tissue mounded along the imaginary line drawn from the marker to the nipple, placing the area of concern tangential to the x-ray beam.

Rolled Views

Rolled views can be obtained to distinguish between a true abnormality and superimposition of structures or to determine the location of an abnormality seen only on the CC view. By rolling the superior portion of the breast in the CC projection, clarification of superimposed glandular tissues can be achieved. The labeling code for the rolled view refers to the direction in which the superior tissue is rolled. For example, a rolled CC view of the right breast with the top of the breast rolled medially is labeled right CC rolled medially (RCCRM). A rolled

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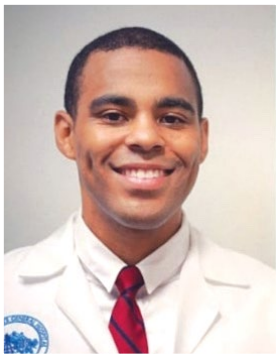
Addressing Disparities in Breast Cancer Care Among Black Women

By Randy C. Miles, MD, MPH



Randy C. Miles, MD, MPH

The year 2020 has seen its fair share of major events, largely because of the emergence of coronavirus disease 2019 (COVID-19). Amid the global pandemic, the deaths of Breonna Taylor and George Floyd during the spring shifted the public's attention to issues related to racial injustice and police brutality, leading to protests around the world calling for systemic reform. Issues disproportionately impacting Black individuals, including disparities in health care, have drawn increased attention, with coalitions forming to better understand how to address many of these long-standing challenges.

Racial disparities in breast cancer mortality among Black women have been well documented over the past 40 years. Early studies largely attributed poor survival in this group to low socioeconomic status.[1] Over time, however, cumulative evidence has indicated that mortality disparities experienced by Black women are impacted by multiple factors, existing along a continuum from breast cancer prevention efforts to posttreatment surveillance. This topic was featured over a decade ago on CNN's *Black in America* series, which highlighted the propensity of Black women to develop biologically aggressive disease associated with poor prognoses. Before the series aired, breast cancer mortality rates in White women had decreased in all 50 states following widespread adoption of screening mammography, while mortality rates in Black women had decreased in only 11 states.[2] The series helped to highlight breast cancer mortality disparities as a public health issue to the general public while also disproving the belief held by some in the Black community that breast cancer was a "White woman's" disease.[3]

Since the series aired in 2008, breast cancer incidence rates for Black and White women have converged. Five-year relative breast cancer survival rates in the United States remain lower in Black women than in White women. Overall, Black women continue to be 42% more likely to die from breast cancer than White women in the United States.[2]

Black women are more likely to receive a diagnosis of advanced stage of disease than are women in other racial groups in the United States, which plays a significant role in ethnic disparities in mortality.[4] Unfavorable tumor characteristics, including an increased propensity for developing aggressive basal-like and triple-negative forms of breast cancer, suggest that biological differences related to ancestral migration patterns from western sub-Saharan Africa may contribute to breast cancer epidemiology.[5] Biological differences may also explain the younger average age at diagnosis among Black women, who are twice as likely as White women to have a diagnosis of breast cancer below the age of 35 years.[6] These factors led the ACR and SBI to update their screening guidelines to assign special status for Black women, recommending risk assessment at age 30 years for women in this group to determine if high-risk screening prior to age 40 years would provide additional benefit.

In addition to biological factors, socioeconomic factors continue to play a central role in differences in survival. Recent data from the US Census Bureau reveal that poverty rates are more than twice as high in Black communities as in White communities in the United States.[7] Patients from low socioeconomic backgrounds are less likely to have a primary care physician and to receive preventive health care services including mammography screening. Socioeconomic disadvantage is also reflected in discrepant patterns of cancer care leading to decreased rates of guideline-concordant adjuvant chemotherapy and radiotherapy, which impacts Black women at increased rates.[8] In addition, comorbid conditions seen at higher rates among this group, including obesity, diabetes, and hypertension, are prognostic factors that have been associated with worse breast cancer–specific outcomes.[9]

There are some encouraging signs that breast cancer prevention efforts are moving in the right direction as gaps in mammography screening rates between Black and White women continue to close over time. Still, more work needs to be done to improve overall screening rates, especially among women from low socioeconomic backgrounds, who often experience access-related barriers. To assist in these efforts, the Institute of Medicine has recommended culturally appropriate strategies to improve breast cancer awareness among diverse audiences.[10] A few steps that can be implemented in breast imaging sections to support these efforts include the following:

- Personal outreach in surrounding communities, especially underserved regions, with the goal of improving breast cancer screening engagement

- Implementation of same-day care programs that consolidate breast imaging services, which can reduce access-related barriers associated with return visits
- Development of multidisciplinary health navigation systems that help guide patients through their breast care experience, which can improve patient retention and reduce delays in care

Multiple targeted efforts along the breast cancer continuum from disease prevention to treatment will be required to decrease breast cancer mortality rates among all demographic groups. I expand more on this topic in my article titled "Closing the Gap: Disparities in Breast Cancer Mortality among African American Women."[11]

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Technologists' Column: Most Commonly Used Additional Views, Part 2: Minimizing Superimposition and Identifying Location ***(continued from page 19)***

CC view of the right breast with the top of the breast rolled laterally is labeled right CC rolled laterally (RCCRL). If an abnormality disappears on the rolled view, it was likely superimposed tissue. If the abnormality persists on the rolled view, it could represent an area of concern that requires further investigation. To locate an abnormality seen only on the CC view as superior or inferior, compare the rolled view with the standard CC view. Focus on the direction in which the abnormality has moved. For example, when a CCRM view is obtained and the area of concern moves laterally, the finding is in the inferior aspect of the breast. When a CCRM view is obtained and the area of concern moves medially, the abnormality is in the superior aspect of the breast.

Follow these steps to obtain rolled CC views:

1. Place the breast onto the IR in the CC projection.
2. For a CCRM view, roll the superior aspect of the breast medially and the inferior aspect laterally. For a CCRL view, roll the superior aspect of the breast laterally and the inferior aspect medially.
3. Hold the breast in this rolled position while applying compression.

The CCRM view has advantages over the CCRL view. First, because the standard CC view is obtained with the technologist standing on the medial side of the patient, the CCRM view makes it easier for the technologist to remove the hand while applying compression. Second, the lateral border of the breast is mobile, so the tissue easy to move medially. Third, most glandular tissue and breast cancers are located in the upper outer quadrant of the breast, so rolling the superior aspect of the breast could superimpose an abnormality over additional dense glandular tissue.[2] However, the exception would be an area of concern that is located in the far lateral aspect on the original CC view, in which case a CCRL view would be more beneficial than a CCRM view.

By using knowledge of these supplemental views, technologists can help radiologists answer important questions necessary to confirm a patient's outcome. In the third and final part of this series, we will discuss positioning techniques for additional imaging that is beneficial for radiologists in making a final determination of findings.

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WELLNESS COLUMN

By Eric Rosen, MD

Eric Rosen, MD

The ACR Radiology Well-Being Program, available free to all ACR members, provides tools and resources for radiologists seeking to assess and improve their well-being. The goal of this article is to introduce SBI members to this valuable resource.

The ACR Radiology Well-Being Program is available at https:/www.acr.org/Member-Resources/Benefits/Well-Being. The Well-Being Program has 4 components:

- Well-Being Index (WBI) survey to anonymously self-evaluate your level of well-being
- Toolkit of radiologist-specific resources on critical well-being topics
- Well-being support guides
- An Accreditation Council for Graduate Medical Education–aligned curriculum for program leaders looking to implement a well-being program for residents

Clicking on the link for the WBI Survey Tool will bring you to a registration site that allows you to access the WBI survey. You can also download the My Well-Being Index app. First-time participants are required to enter an invitation code (ACRPHYSICIAN), provide their email address, and choose a password. The privacy policy explicitly states that no personally identifying information is required and that all information is kept confidential and used only in aggregated, deidentified form.

The WBI survey uses 9 questions to calculate your well-being score. WBI scores fall into 7 tiers ranging from extremely low to excellent. In addition to individual scores, relative ranking compared with other radiologists and physicians is provided. Each of the following 6 categories is also scored:

- Meaning in work
- Likelihood of burnout
- Severe fatigue
- Work-life integration
- Risk for medical error
- Suicidal ideation

Scores are graded from very low to very high (1-10) and presented as an image resembling a fuel gauge on an automobile (empty = very low; full = very high). On the basis of your WBI score, resources for well-being are selected, and each of these is listed immediately below the score. Simply clicking on the category will take you to the available resources, which are categorized as organizational (ACR), national, key publications, other, and overview video. You can also view all available resources by selecting the resource icon on the toolbar located on left side of the screen. Resource categories exist for the following:

- Stress and resiliency
- Fatigue
- Emotional concerns
- Suicidal thoughts
- Health behavior
- Money
- Alcohol/substance use
- Career and professional development
- Relationships and work-life balance
- Medical errors and malpractice
- Organizational and leadership resources

If you are wondering how a 9-question survey can accurately assess your well-being, not to mention allow assessment of risk/reward, simply click on the gray information bar at the bottom of the page. Additional details can be found under the Articles of Research icon. ACR members can assess and track their well-being over time by setting up email reminders for every 1, 3, 6, or 12 months (you can also select "never").

Finally, the ACR Radiology Well-Being Program page includes links to 6 well-being support guides designed to support areas in radiologists' lives that affect burnout. Each guide follows the same format and combines video and literature. Support guides currently exist for these topics:

- Resilience
- Communication
- Self-care
- Mentorship
- Diversity and inclusion
- Conflict resolution

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Preparing Patients for Biopsy Results During Biopsy Recommendations and Biopsy Procedures

By Roger Yang, MD; Brandi Nicholson, MD; Meredith Watts, MD; Mary Scott Soo, MD, FSBI

There are multiple avenues, each with advantages and disadvantages, for delivering results to patients after imaging-guided breast biopsies. Options include having radiologists communicate in person and by phone, having physician extenders on the radiology team assist in communications, and having only referring providers notify patients. A growing number of electronic communications choices are also available in the United States and have been accentuated recently by the social distancing considerations forced by the coronavirus disease 2019 pandemic, although issues of patient confidentiality, security of transmissions, and other regulations may limit some of these options. With these choices for delivery of biopsy results, most imaging practices develop protocols that evolve over time according to the local milieu of radiologists and referring clinicians. Academic radiology practices and smaller private practice groups might have a locally developed, single, specific paradigm. However, consolidation of health care providers into multisite radiology practices and larger multihospital health care systems necessitates a varied approach to breast biopsy result delivery, requiring the breast radiologist to adapt to the specific protocols of each site rather than strictly adhering to any preferred method. Regardless of the practice setting or established result-delivery paradigm, radiologists have an opportunity to prepare patients for potential results at the time of biopsy recommendation and during the biopsy, helping patients understand and process information about impending results.

Preparing Patients During Biopsy Recommendation

During biopsy recommendations, specific phrases may be helpful depending on where the discussion is taking place and the level of concern about the finding. For example, when recommending biopsy in the ultrasound room after the scan, the radiologist could indicate the mass on the screen and begin by saying, "I need to recommend a biopsy so we can find out what *this* is." Usually 1 of the 3 following statements introduce the rest of the conversation: "I am concerned about it and a biopsy is the best next step," "I am not sure what this abnormality is, so we need to perform a biopsy to find out," or "This is probably a very commonly seen, benign finding that would not be harmful to you, but we need to do a biopsy to be sure." Noting the patient's response to the statement helps the radiologist discern how much additional detailed information the patient can tolerate and understand.

While some patients are not ready to discuss the possibility of breast cancer, most patients understand that a breast cancer diagnosis is possible and want to know the diagnosis. Some radiologists advocate mentioning the word *cancer* to every patient in whom they recommend a biopsy, incorporating it differently according to the lesion and the patient. In low-risk lesions, the word *cancer* might be mentioned to justify doing a biopsy, but the emphasis is on how unlikely that is and that the lesion is more likely to be benign, which would be good news. However, in BI-RADS 4C or 5 cases, statements such as "I am worried this could be a cancer and biopsy is the next step to figure out why this lesion developed in your breast" place proper emphasis on the likelihood of malignancy. Explicitly stating that the lesion is highly suggestive of cancer might even be necessary for patients who decline the biopsy and express denial about having any problem in their breasts. On the other hand, for patients agreeing to the biopsy but deflecting any discussion about possible outcomes, the radiologist should probably refrain from mentioning the level of suspicion for cancer at that time.

Setting expectations about the timing of results is also important because many patients become quite anxious about a possible cancer diagnosis. Indicating that the results will not be available the day of the biopsy and describing when and by whom the patients will be notified can help them manage their anxiety.

Preparing Patients on the Day of the Biopsy Procedure

During the consent process before the biopsy, the radiologist often must focus on the patient's concerns about the procedure itself, waiting to discuss potential results until the procedure is completed. However, if a patient appears particularly reserved and not communicative, an inquiry about her greatest concern related to the procedure might reveal her fear of a cancer diagnosis, which would prompt a conversation about potential results appropriate to that moment.

For most patients, procedure-related anxiety begins to diminish at the conclusion of the procedure and they are open to discussing possible results and next steps. The biopsy radiologist may first try to ascertain what was discussed at the time of the diagnostic work-up. Then, depending on the patient's specific situation,

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Preparing Patients for Biopsy Results During Biopsy Recommendations and Biopsy Procedures (continued from page 23)

the radiologist may provide a scripted explanation of broad categories of biopsy results, such as benign concordant, malignant concordant, borderline concordant, and discordant results, to set the stage for delivering the actual results. This creates an expectation that the results will fall into one of these broader pathology groupings and will provide context and facilitate patient understanding when specific results are delivered. For example, after a preparatory discussion, a specific concordant result of pseudoangiomatous stromal hyperplasia might be hard for a patient to pronounce or comprehend but could be easily understood as benign and prompting only imaging follow-up rather than surgery. Likewise, imaging-histology discordance after biopsy of a BI-RADS 5 lesion that yields fibrofatty tissue would be easier for the patient to comprehend if the category of discordance had already been explained. A borderline category result of atypical ductal hyperplasia requiring surgery would also be easier to convey in a discussion with the intellectually prepared patient.

Specific phrases, adapted for the patient's situation, could include the following information: "Results typically end up in one of the following categories: benign, which is good news with just follow-up mammograms; a borderline or high-risk result, where we often recommend surgery because the pathologist needs more tissue samples to make a final diagnosis; or if the biopsy happens to show a cancer, then we would schedule you to see a surgeon and other doctors to help ensure you get the precise medical care you need." At the conclusion of the discussion, additional phrases such as "I am hopeful this will be good news, and we are one step closer to an answer" can be supportive and encouraging for these women. Some practices also provide patients on the day of biopsy with a written or electronic document that outlines these broad outcome categories and includes a range of common yet specific potential histologic results. This document is available for the patient's reference when contacted by phone or other electronic methods about results.[1]

For patients who will receive results in person, there are additional considerations in preparing the patients on the day of biopsy. The radiologist might ask the patient to bring a supportive family member or friend to help process information and assure all their questions are answered when they return to discuss results. Further, asking patients to refrain from viewing pathology findings in their electronic medical record if available—or ensuring the pathology report is not released until they are notified—is important because the pathology report may not provide a complete or comprehensible picture of their results, particularly in complex situations. Because many patients are anxious to get the results right away, it might also be helpful to explain to patients receiving results in person that waiting several days for results allows for additional information to be available. For example, some radiologists discuss tumor receptor status, introducing the treatment implications that will be discussed in more detail with the treating oncologists.

Because the radiologist can very reliably predict the results of BI-RADS 4A and 5 lesions, preparing patients for results in these cases can be quite reassuring for those with low-suspicion lesions and can provide more time to adjust to the possibility of an almost inevitable cancer diagnosis for those with highly suspicious lesions. These preparations help expedite communications during delivery of a breast cancer result, which will be discussed in the next communication column in *SBI News*.

Reference

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Wellness Column (continued from page 22)

A great list of activities, webinars, and podcasts is also available at the Well-Being Resources During COVID-19 page. This collection was started by ACR Well-Being Workgroup member (and breast imager) Rebecca Seidel, MD, who is chair of the Wellness Committee at Emory University. You can watch recorded webinars like the University of Washington's "Coping with Uncertainty About the Coronavirus," download free apps for mindfulness/meditation/self-care, access free workout and yoga videos, get free nightly live streams to the New York Metropolitan Opera, and access many other great resources.

The ACR has done a nice job creating this resource. It provides a quick way to assess your current state of wellness, offers a large amount of focused material, and allows radiologists to track their wellness over time. If you haven't already done so, I encourage you to check out this wonderful resource!

Radiomics and Radiogenomics for Breast Cancer Imaging: Where Do We Go From Here?

By Despina Kontos, PhD

Despina Kontos, PhD

Prognostic and predictive biomarkers are essential components of personalized and precision-based breast cancer treatment. Advances in the molecular profiling of breast tumors have enabled the introduction of several genomic assays in oncology practice. It is now understood that breast cancers are highly heterogeneous, with significant cell-to-cell genomic differences within even small tumors.[1] Although challenging to measure clinically, intratumoral genomic heterogeneity—coupled with epigenetic changes and the dynamic plasticity of the tumor microenvironment—is increasingly recognized as a critical factor in tumor progression and treatment resistance.[2]

Currently, the heterogeneity of breast tumors is not routinely assessed. Histopathologic and molecular tumor assessment is primarily based on the analysis of selected histological sections from core biopsy or excision. While useful for diagnosis, prognosis, and initial therapy selection, such limited sampling cannot fully capture the heterogeneity of an entire tumor, resulting in incomplete information to guide prognostication and treatment. Liquid biopsies, or samples of circulating tumor cells or tumor DNA or RNA, have a potential advantage by capturing genomic heterogeneity. However, the sensitivity of these newer techniques remains less than ideal.[3]

Emerging Role of Radiogenomics as a Prognostic and Predictive Marker

Multimodality imaging offers an unprecedented opportunity to capture tumor heterogeneity in vivo. The term *imaging genetics* was coined initially by neuroimaging researchers who sought to understand complex associations between genetic traits and brain-related disorders.[4] In this rapidly growing field, the need to examine complex associations between high-dimensional imaging data sets and genomic information led to the development of statistical methodologies based on extensive univariate and voxelwise tests, penalized multivariate models, and sparse multivariate regressions.[5,6] Most recently, such methods have been explored in breast cancer research to further elucidate the molecular underpinnings of tumor imaging phenotypes and to evaluate joint associations of imaging and genomics with cancer outcomes, giving rise to the emerging field of radiogenomics.[7]

While breast cancer radiogenomic studies share similarities with neuroimaging applications, there are some crucial differences. Since cancer radiogenomics seeks to characterize tumor imaging patterns in a relatively smaller region of interest without an a priori spatially defined anatomy as compared with the brain, radiomic patterns are typically analyzed and interpreted at the tumor level or within specific tumor subregions (eg, habitats), not on a voxelwise level as is common in neuroimaging. An imaging signature is typically constructed by extracting an array of radiomic features. Depending on the available genomic data, such as microarray gene expression data or next-generation sequencing data, different methods are employed to mine imaging-genomic associations.

For example, Ashraf et al extracted a multiparametric imaging signature from breast dynamic contrast-enhanced magnetic resonance imaging and identified 4 intrinsic imaging phenotypes of early-stage, hormone receptor–positive breast cancer. These phenotypes correlate with the recurrence score provided by the Oncotype DX (Genomic Health, Inc) gene expression assay.[8] Li et al showed that radiomic phenotypes from breast dynamic contrast-enhanced magnetic resonance imaging scans also correlate with scores provided by the MammaPrint (Agendia, Inc) and PAM50 (NanoString Technologies) prognostic gene expression assays.[9] More recently, Braman et al showed that combining intratumoral features with peritumoral radiomics can identify molecular subtypes of ERBB2 (formerly HER2)–positive breast cancers and predict response to ERBB2-targeted therapy, suggesting a role of the peritumoral environment in immune response.[10]

Challenges, Limitations, and Clinical Translation

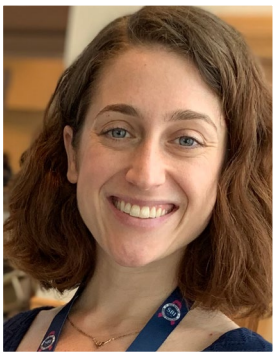
While work to date has elucidated promising associations, there are still important limitations. Radiomic features typically rely on several parameters that need to be optimized during feature extraction, which has led to a challenge in standardizing such features across different software platforms. As imaging technology continuously evolves, with vendors adopting different clinical imaging acquisition protocols that are often proprietary, it is difficult to adequately measure the effects of imaging acquisition on the extracted features. Thus, it may be beneficial to focus ongoing efforts not only on the standardization of individual features but also on how to identify robust features, or high-level meta-features and multiparametric signatures, that are independent of differences in acquisition protocols. Toward this end, machine learning and deep learning can prove to be useful, albeit limited by the ability to interpret the constructed imaging patterns.

Continued on page 27 >

MEMBER-IN-TRAINING COLUMN

INTERVIEWING FOR A BREAST IMAGING FELLOWSHIP

By Sophia O'Brien, MD



Sophia O'Brian, MD

The fellowship application and interview season is upon us! In the midst of the coronavirus pandemic, the 2020-2021 breast imaging interview season will look vastly different from those of years past. The SBI Fellowship Match Committee and the Resident and Fellow Section Committee have worked together to create resources to help applicants navigate this unique and exciting process.

Application submissions opened on August 1, 2020, and are accepted on a rolling basis, although we recommend that you submit your applications as early as possible. Earlier submission gives programs ample time to review your application before interview slots are extended or filled.

Although most breast imaging programs participate in the National Residency Match Program Match (NRMP), a few do not. A directory of all participating breast imaging fellowship programs is listed on the SBI website under the Resources tab. Programs may be dedicated to breast imaging training only or may be a combined fellowship with another specialty such as body or musculoskeletal radiology.

Interviews can begin as early as November 1, 2020 (for programs both within and outside the Match) and will be completed by March 31, 2021. Match Day is determined by the NRMP and is typically sometime in June. If you interview at non-Match programs, they can offer you a fellowship position on the spot or anytime after your interview, and you will have 7 days to decide whether or not to accept their offer. If you accept, you will then cancel any upcoming interviews, notify programs you have already applied to/interviewed at, and not participate in the Match.

There is no magic number of programs to which you should apply or at which you should interview. In good news for applicants, in the most recent 2020 Match there were more breast imaging fellowship positions than applicants, so the odds are in your favor!

Discussion of the many nuances to this process, as well as best practices and ways to stay organized, are detailed on the SBI Interview Resources web page. These resources include the following:

- A time line graphic to keep you on track
- A month-by-month detailed description of the application and interview process
- Tips for residents: questions to ask on a fellowship interview. Examples:
  - What is the volume of cases and variety of caseload in your division?
  - Are there opportunities to teach residents and medical students?
- Frequently asked questions about the application and interview process. Examples:
  - My top choice did not offer me an interview. Is there anything I can do? (Spoiler: yes! See the SBI Interview Resources for details.)
  - What are good ways to assess whether I would fit in well with a program, especially considering the move to virtual interviews this year?

Here are a few questions we asked 2 program directors about the virtual interview process, with their responses:

1. Applicants often learn important and intangible information about a program's culture and interpersonal relationships in the "moments in between" during in-person interviews, while taking a tour, or by just seeing attending physicians pop in and out of the interview suite. How will your program try to convey your unique culture and work environment on a virtual interview platform?

Gary Whitman, MD, FSBI (University of Texas MD Anderson Cancer Center)**:** Candidates will talk with current fellows and get their contact information.

Janine Katzen, MD (Weill Cornell Medical College)**:** The warm and inviting culture at our program is one of its greatest strengths. While conveying the "feel" of our program will be challenging on the virtual platform, we hope to do so with a combination of videos and virtual events. A main focus of our recordings will be to highlight the interpersonal connections that are an integral component of our breast imaging practice.

2. In addition to learning about different fellowship programs, interviewees on an in-person interview trail also get to meet and network with peers entering their field. Will there be opportunities for virtual "mingling" during this year's interview season?

JK: In the past, we have concluded our interview days with an off-campus lunch attended by the current fellows and applicants. This has allowed applicants to gain the perspectives of the fellows without faculty being present. Our plan for this interview season is to have 3 evening virtual sessions where applicants will have the opportunity to chat with both current and former fellows. This provides the dual advantage of learning not only about the fellowship experience but also how prepared our former fellows felt upon entering practice.

3. Are there any unexpected benefits or new opportunities afforded by a virtual interview season?

GW: Virtual will save time and money.

JK: Historically, applicants noted the burden of travel as one of the greatest challenges associated with the match. This included both expense and weather-related difficulties. Going virtual this year completely eliminates these issues. In addition, without the concern of travel costs and time away from rotations, applicants might be able to interview with more programs in which they are interested.

A WhatsApp group created this year by SBI resident members is another great resource for breast imaging fellowship discussion, questions, and community. The group includes applicants, fellows, and attending physicians. Feel free to join the conversation!

We wish you the best of luck in your application process and on the virtual interview trail!

Physics & Technology Column: Radiomics and Radiogenomics for Breast Cancer Imaging: Where Do We Go From Here? *(continued from page 25)*

In addition, most studies to date have analyzed either univariate or multivariate associations of individual radiomic features with different genomic variables but have not evaluated associations between patterns of imaging phenotypes and patterns of genomic variables such as biological pathways. Looking at the former types of pairwise or more straightforward regression models can provide some hypothesis-generation paradigms but may be challenging to generalize because of the variability of the individual radiomic features and because tumor evolution is rarely, if ever, the result of single-gene processes. Developing the appropriate multivariate statistical methodology may be challenging since the goal is to identify bidirectional association patterns between high-dimensional variables, which will require cross-disciplinary collaborations to bridge imaging with statistics, machine learning, bioinformatics, and the rapidly evolving field of multiomic data integration.

Finally, while related statistical and machine learning methodologies are still under development, the critical question to address is to what extent imaging phenotypes can provide additional information to current histopathologic and molecular markers for augmenting clinical decision-making for precision therapy of breast cancers. It is essential to promote data-sharing practices to accelerate independent validation and to evaluate the generalizability of findings. The evaluation of radiomic markers in prospective randomized clinical trials with long-term patient outcomes will be critical.

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Anna Crollman

By Hannah Perry, MD

Hannah Perry, MD

HP: Please tell me about yourself and your background.

AC: I am a blogger, health care advocate, new mama, and local government employee. My husband I have been married 6 years and welcomed our postcancer rainbow baby this past November. We also have a mini goldendoodle named Sophie and enjoy living in Cary, North Carolina. I love fashion and have a passion for sharing beauty and style tips to help women everywhere feel more confident in their skin.

Can you discuss how you were diagnosed with breast cancer?

In June 2015 my husband and I were newlyweds planning to start a family. After discovering a breast lump while in the shower, I quickly made an appointment with my gynecologist. Thankfully they referred me for imaging despite the low likelihood of breast cancer being present in a 27-year-old.

I initially delayed the ultrasound due to the cost at the university medical center and ended up being seen at an outside imaging facility. After an ultrasound and mammogram, the outside imaging facility referred me back to the university medical center for a biopsy. My biopsy was initially scheduled for a few weeks out, but due to upcoming travel plans, I requested to have my biopsy done that day. I waited all day until one of the radiologists could see me for the biopsy. I received the news of my breast cancer diagnosis a few days later while on vacation in Mexico with my girlfriends.

How did you feel when you learned of the news?

I will never forget the moment I received the diagnosis. One minute I was sipping margaritas and devouring fresh fruit, and the next my phone is ringing with a home number displayed on the screen. I stepped away from the table and heard the nurse's voice on the other end. "You are not going to like what I have to say, but you have breast cancer." The words felt like they physically cut me to my core. I lost all sense of space and time. The swarms of tourists in swimsuits flashed by me in a blur as I sat on the bench repeating the words I had just heard over and over again. Sobbing, I managed to call my husband and mother, who were thousands of miles away. My heart broke to give them the news we had all been fearful of. That night I lay awake grappling with my own mortality and the thought that if cancer didn't kill me, we'd go bankrupt.

What was your treatment process? Did you face any treatment obstacles? How did you overcome them?

I had stage IIB triple-positive breast cancer, and as we would come to see, I was a bit unique, seeming to experience every slim and unlikely side effect and complication possible. I started my treatment with a single mastectomy to quickly remove the cancer in my breast. I developed a hematoma and was rushed back into surgery. Two days after the surgery we moved into our new home and I had a hard time limiting my movement as I wanted to get settled and get back to some sense of normalcy. The recovery process taught me a big lesson in giving up control, finding new kindness for myself and my body, and asking for help.

Two weeks following my surgery I began the fertility preservation process with egg retrieval and embryo cryopreservation. I found this process to be more emotionally trying than the mastectomy or chemotherapy that would follow. Before my diagnosis I was on the path to becoming a mother, and it felt as if that opportunity was ripped from me overnight.

Two weeks after the fertility process, I began 6 rounds of chemotherapy. I managed to continue working all throughout my treatments and found that working provided me with a sense of normalcy. As treatment wore on, my fatigue increased, and the emotional toll of sickness became more challenging to cope with. I was also dealing with medical menopause caused by the Lupron [leuprolide acetate] shots that I began at the same time as chemotherapy. While I tolerated the chemotherapy drugs relatively well, I had an allergic reaction to my very last Neulasta [pegfilgrastim] shot on New Year's Eve 2015, which made for an eventful New Year's Eve.

In January 2016 I began my second form of hormone-blocking medication (letrozole). This put me in complete medical menopause and my symptoms worsened. Vaginal dryness, painful sex, joint pain...the list goes on. Around this same time, I went in for a preventive mastectomy on my right side and began the reconstruction process, which would ultimately last 2 full years and

require 5 surgeries. It was hard to adjust to this new normal, and I suffered a period of deep depression adjusting to life after active treatment. With time, I learned to cope through meditation, therapy, writing, and giving back to the breast cancer community.

What motivated you during your diagnosis and treatment process?

When I was first diagnosed I struggled to find support tailored to young women facing breast cancer, so I decided to share my story. I figured that if I was seeking the information, maybe I could use my experience to help others. Being able to share my story and help others kept me motivated and connected me to the wider community of breast cancer survivors around the globe. My blog, *My Cancer Chic*, grew and I became more involved as an educator and volunteer for organizations like Young Survival Coalition and Living Beyond Breast Cancer. This involvement brought me a sense of fulfillment and purpose as I put my plans for motherhood on hold.

What did you learn from your experience?

I learned that I am a lot stronger than I thought. The emotional toll of cancer treatment and life after is rarely discussed. You become so focused on the treatment milestones that a life after is hypothetical. When you get to the "after" it can be difficult to process everything you have faced and form connections again. I learned that I will never be the woman I was before, but I am proud of the woman I have become. She is strong and resilient and much more confident than she was before.

How has this diagnosis impacted your life?

Cancer wasn't a gift, but what I made of it has been. It led me to pursue a new career, using my writing as a means to inspire and support others. I have been able to make lifelong friends in the community of survivors, advocates, and health care providers. I am also a much better parent now because of all the pain and suffering I have been through. It gave me a new perspective on life.

Are there any lessons that you think the breast imaging community can learn from your experience?

I think the number 1 thing I want the breast imaging community to know is that young women can and do get breast cancer. It breaks my heart to daily receive stories of young women who were diagnosed with advanced-stage cancer because a health care professional dismissed their concerns regarding a lump or body sign. Women know their bodies best, and you can be the patient's advocate when it comes to testing.

I also hope that the imaging community can learn from my experience and see how difficult the emotional side of cancer can be. Kindness and compassion can go a long way; the words you use matter. Think about your daughter or sister in the chair when seeing patients. How would you speak to them? How would you treat them? The more we build relationships of trust and kindness with our health care providers, the easier it is to cope with the terrifying reality of a cancer diagnosis.

Empower your patients. The more you take time to explain the details of the imaging findings or the biopsy results, the more empowered a patient becomes. I never regretted any of my decisions because I was an informed patient. While there are things I may do differently now based on new research and options, I will always be grateful for the support and encouragement my medical team provided, empowering my decisions for treatment.

What advice would you give to other patients who are going through the diagnosis and treatment process for breast cancer?

You are not alone. Cancer treatment and life after can be isolating, but I want to remind every single patient that you have an amazing community of support behind you—both from other patients and from the health care world. Don't be afraid to reach out. Community will be your lifeline during this chapter of your life. I would also say that there is life beyond cancer. It will be different, but you will find light again and there is joy waiting for you around the bend.

Breast Cancer Diagnosis at the Time of COVID-19: EUSOBI Recommendations

By Anna D'Angelo, MD; Maria Adele Marino, MD; Paola Clauser, MD; Elisabetta Giannotti, MD; Julia Camps Herrero, MD

With the coronavirus disease 2019 (COVID-19) pandemic, most affected regions and countries rearranged their health care resources to manage this emergency, which had a profound impact on the entire oncology community and on the treatment of patients with breast cancer.[1] The European Society of Breast Imaging (EUSOBI) touched base with their members as radiologists at the front line of the pandemic.

Anna D'Angelo, MD

Maria Adele Marino, MD

During the first EUSOBI journal club last June (https://www.eusobi.org/breastimagingwebinar-recordings/), the panelists discussed an article by Curigliano et al[2] titled "Recommendations for Triage, Prioritization and Treatment of Breast Cancer Patients During the COVID-19 Pandemic." The panelists shared their experiences and discussed pandemic-related information for breast cancer clinical practices. This meeting was a huge success and provided an opportunity for viewers to ask questions of the panelists in real time.

The EUSOBI also presented their recommendations for breast care provision and procedural prioritization during the COVID-19 pandemic, specifically focusing on screening, diagnosis, and management of breast conditions (https://www.eusobi.org/news/recommendations-breast-covid19/). The EUSOBI recommendations take into account the general plans already proposed by the Italian College of Breast Radiologists by the Italian Society of Medical Radiology,[3] French health professional societies,[4] the Dutch working group for breast surgery, the US Society of Breast Imaging, and the Canadian Society of Breast Imaging.[5] Recommendations for whole-body oncologic imaging are left to general oncologic imaging recommendations (www.esmo.org/, 2020; www.asco.org/, 2020). In cases of discrepancy between local health regulations and EUSOBI general recommendations, the official local guidelines should be followed. The recommendations present patients' risk stratification from high to low priority. Recommended prioritization of imaging is as follows:

- High priority: rapid appointment
  - Imaging of women with suspicious breast or axillary findings
  - Diagnostic imaging in women with abnormal results on screening examination
  - Magnetic resonance imaging (MRI) screening in women at very high risk for breast cancer
  - Exploration of incidentally detected abnormalities on other imaging modalities (eg, chest computed tomography)
  - Search for occult primary cancer
- Medium priority: appointment within 3 months
  - Follow-up imaging in women with BI-RADS 3 findings on a previous examination
  - Mammographic screening in women at high risk for breast cancer
  - Systematic follow-up after breast cancer
- Low priority: appointment within 6 months
  - Breast MRI for breast implant evaluation
  - Screening mammography in healthy women at average risk for breast cancer

EUSOBI 2020 Online During Breast Cancer Awareness Month

Because of the global COVID-19 crisis, the 2020 EUSOBI Annual Scientific Meeting could not be organized as planned. This unfortunate decision was necessary to ensure the safety and health of our community and faculty from all over the world. Therefore, the EUSOBI Executive Board and the EUSOBI 2020 Programme Planning Committee decided to hold a virtual event consisting of 4 online sessions, each highlighting a different topic brought forward by our members. These sessions are spread throughout October, Breast Cancer Awareness Month. Participation is free of charge for EUSOBI Members active in 2020! Further details are available here: https://www.eusobi.org/online-in-the-breast-cancer-awareness-month/.

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MARK YOUR CALENDAR

Upcoming Events

Some events may be tentative, depending on the status of the COVID-19 pandemic. Please check event websites for updates.

November 3-4, 2020 Seoul, Korea	ASMRM 2020 & ICMRI 2020
November 8-14, 2020	National Radiologic Technology Week 2020
November 29 to December 5, 2020	Radiological Society of North America (RSNA) Annual Meeting
March 19-24, 2021 Las Vegas, NV	Annual Interdisciplinary Breast Center Conference (NCoBC)
April 9-11, 2021 Virtual	2021 SBI/ACR Breast Imaging Symposium
April 18-23, 2021 San Diego, CA	American Roentgen Ray Society 2021 Annual Meeting (ARRS 2021)
April/May 2021 *(to be announced)* Toronto, ON, Canada	Toronto Breast Imaging Conference
June 3-5, 2021 Athens, Greece	IBUS Course 2021 - Multimodality Breast Imaging and Image-Guided Interventions

Please visit the SBI Calendar of Events at www.sbi-online.org for a complete listing of events.