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Donna Handley

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Bringing distinction to our Institute

Everyone who works within the Hartford HealthCare Cancer Institute (HHCCI) — whether they are physicians, nurses, technicians or support staff — deserves to be recognized for the outstanding work they are doing to make our Institute a place for across-the-board excellence in cancer care.

We all know we are doing incredible work on behalf of our patients, but it's always nice when one of our own receives a moment in the spotlight for making a meaningful contribution to our mission and adding to our reputation for world-class care.

That's why I was so pleased to see the article in the Jan. 25 edition of the ASCO Post — the official newspaper of the American Society of Clinical Oncology — featuring Dr. Jean M. Weigert and the groundbreaking research she is conducting in the use of ultrasound technology to detect breast cancer.

Dr. Weigert, a distinguished radiologist at The Hospital of Central Connecticut, has been practicing for close to 30 years and recently completed a four-year study into the efficacy of ultrasound in detecting breast cancer in women with high

breast-tissue density. Her findings strongly suggest that ultrasound is in fact a useful alternative to mammograms for at-risk women with dense breasts. She also presented her findings in December at the annual San Antonio Breast Cancer Symposium, where her study was widely credited for lending statistical support for the use of ultrasound.

We are proud of Dr. Weigert and the work she has done to improve the care that we provide to breast-cancer patients. We are also proud of how her efforts reflect positively on our Institute with her contributions to scientific literature regarding breast-cancer detection. We are enormously fortunate to have highly trained researchers, clinicians and other experts across our Institute who are routinely advancing our understanding of cancer and how best to defeat it.

Dr. Weigert is just one example of the people who bring distinction to our organization every day.

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HHCCI researcher nationally recognized for breast study

Dr. Jean M. Weigert has dedicated her professional life to improving the treatment of breast cancer through the use of enhanced technology to detect cancer in its earlier stages.

So Dr. Weigert, a radiologist specializing in breast imaging at The Hospital of Central Connecticut (HOCC), admitted to feeling uncomfortable when, in 2007, she found herself publicly opposing a

state law that would make it mandatory for at-risk women with high levels of tissue density in their breasts to be informed about ultrasound screening and other detection alternatives to standard mammograms.

"I was at the statehouse in Hartford testifying against this law, and there were all these women there who felt like I was betraying them," Dr. Weigert recalled. "I certainly empathized with

their position, but as a researcher and a practicing specialist in the field, I felt that the research wasn't there to support them."

Although Connecticut would become the first state in the country to adopt a law mandating that physicians inform patients about the potential shortcomings of mammograms — whether they

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RESEARCHER from page 1

have high breast density or not — Dr. Weigert feared it would expose women to unnecessary ultrasounds without any discernable benefit in detecting cancer in earlier stages.

She decided to conduct her own research into the matter. She carefully established the parameters of a broad-based survey of breast-cancer candidates from across five radiology sites within the cancer program at HOCC, which is part of the Hartford HealthCare Cancer Institute. Over the course of the four-year trial, she analyzed an average of 31,000 mammograms per year, as well as roughly 3,000 annual ultrasonographic exams for women with dense breasts.

The results of her research have been gaining attention from across the country, including an article in the Jan. 25 edition of the ASCO Post, the newspaper for the American Society of Clinical Oncologists. The article reported findings showing that the rate of detection did increase on a consistent level for women with dense breasts who received ultrasound screening.

In particular, the study reported the number of cancers found per 1,000

patients screened was 4.0 in year 1, 3.2 per thousand in year 2, 3.2 per thousand in year 3, and 3.2 per thousand in year 4. The fact that the rate of detection remained constant as the trial progressed indicated the efficacy of ultrasonography — because normally the rate of detection would go down as more of the population is screened, Dr. Weigert said.

She said the study showed that ultrasonography made it possible to decrease the number of unnecessary biopsies. Ultrasonography also detects twice the number of cancers found in screening mammography alone.

Dr. Weigert told the ASCO Post that the screenings detected all types and grades of breast cancer, with few risk factors other than dense breast tissue.

“They are exactly the kinds of cancers we hope to find on mammography, but it took ultrasonography to find them,” Dr. Weigert told the paper.

Dr. Weigert also presented her findings at the annual San Antonio Breast Cancer Symposium in December, sponsored by the

American Association for Cancer Research. Many researchers observed that the findings will go a long way in overcoming reservations about the efficacy of ultrasound screenings.

“I like to think that the findings in my research have real-world implications,” said Dr. Weigert, who grew up in a family of scientists and clinicians, including her great uncle Paul Ehrlich, the Nobel Prize-winning physician and researcher who famously identified the “magic bullet” theory of targeting disease-causing organisms.

Dr. Weigert’s work on behalf of breast cancer patients reflects the depth of expertise and clinical accomplishment across the Hartford HealthCare Cancer Institute, said her colleague Patricia DeFusco, MD, the medical lead for the HHCCI Breast Cancer Disease Management Team.

“Dr. Weigert’s work demonstrates the potential that we have within the HHC Cancer Institute to make important contributions to the scientific literature by thoughtfully analyzing the outcomes of patients in the community setting,” she said.

■ **Spotlight deserved, page 8**

Hartford HealthCare
The Connecticut Experiment:
 4 Years of Screening Women with Dense Breasts with Bilateral Ultrasound
 Jean M. Weigert MD FACR
 Hospital of Central Connecticut and Mandel and Blau MD's PC

Purpose
Purpose: To determine if screening breast ultrasound in women with mammographically normal but dense breasts is useful for the detection of breast cancer.

Objective
Objectives: To analyze the type of cancers and high risk lesions diagnosed in women with normal mammograms with dense breasts with the addition of bilateral breast ultrasound and determine whether these lesions make an impact on clinical outcomes.

Background
 • ACRIN 6666 '08 study documented that u/s detected an additional 4.2 cancers per 1000 high risk females
 • 2004 study found that 90% of cancers detected by ultrasound alone were stage 0 or 1

Schemata of Data Collection from 5 Sites

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    graph TD
        A[Women who had a mammogram] --> B[Women with breast density >20%]
        A --> C[Abnormal mammograms]
        A --> D[Women with breast density <20%]
        B --> E[Women lead to follow-up]
        B --> F[Women receiving screening ultrasound]
        C --> G[Excluded]
        D --> H[Excluded]
        E --> I[Normal breast ultrasound]
        E --> J[Soft tissue thickening]
        F --> I
        F --> J
        I --> K[Lead to follow-up]
        J --> L[Surgery breast lesion]
        J --> M[Major breast lesion]
    
```

Lesion Characteristics Year 1, 2, 3, and 4

Year	Screened	Ultrasound	Mammogram	Biopsy	Ultrasound	Mammogram	Biopsy
Year 1	11,111	1,111	1,111	1,111	1,111	1,111	1,111
Year 2	11,111	1,111	1,111	1,111	1,111	1,111	1,111
Year 3	11,111	1,111	1,111	1,111	1,111	1,111	1,111
Year 4	11,111	1,111	1,111	1,111	1,111	1,111	1,111

Results Year 1, 2, 3, and 4

Year	Screened	Ultrasound	Mammogram	Biopsy	Ultrasound	Mammogram	Biopsy
1	3479	278	191	11	11	11	278
2	3000	280	190	11	11	11	280
3	3000	278	190	11	11	11	278
4	2997	280	191	11	11	11	280

Discussion
 Screening Breast Ultrasound in women with Mammographically Dense Breast Tissue (>20% Breast Density) Cancer
 This has continued in the same vein throughout the first four years since passing legislation that mandates informing patients of the breast tissue density and allowing them to choose to have additional imaging with breast ultrasound. The PPV has improved indicating that an expected there is a learning curve in deciding which women to follow and which to biopsy. Overall, a slight excess finding rate remains steady at about 30% which may be due to lack of education for more likely noninvasive lesions. There is no association of risk factors other than "Cancer" trends in this group of patients. Higher grade tumors are the lesions more likely to have positive sentinel nodes. There has been a progressive decrease in the size of lesions detected with the targeted lesions in Year 1. The average size is currently less than one centimeter. Cancers are found in women having yearly USG.

Summary
 The addition of bilateral breast ultrasound to screening mammography in women with mammographically dense breast tissue (>20%) increases the ability to find cancers in this patient population. There are predominantly small and node negative cancers of high grade. Women having repeat ultrasound are less likely to have cancers diagnosed indicating that in this patient population this test should be part of their routine yearly "screening" procedure.

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A copy of the poster outlining Dr. Weigert’s study, which was on display at the annual San Antonio Breast Health Conference in December.

Genetics emerging as a key field in cancer research and treatment

Q. Can you describe your role as the lead genetic counselor at the Hartford HealthCare Cancer Institute?

A. I work as part of a team with other genetic counselors across the Institute to see patients for cancer risk assessment and consideration of genetic testing. We educate and update healthcare providers about genetic counseling and testing options, as well as help identify and manage patients and their families who are at risk for hereditary cancer.

Q. Why is the study of genetics important to our understanding of cancer?

A. All cancers have a genetic basis, but not all cancers are inherited. Certain cancers with specific genetic mutations may respond differently to chemotherapy than those without specific mutations. When a healthcare provider uses genetic information to guide medical decisions, this is an example of personalized medicine.

Q. How large a role does genetics play in determining the likelihood that someone may get cancer?

A. Genetic counseling and testing for hereditary cancer are not indicated for every patient — yet. The majority of cancers are not inherited and do not run in families. However, about 5 percent to 10 percent of cancers are attributed to a person's genetic makeup, or specifically, a single gene mutation that they were



Sara Carroll, MS, CGC

*Lead Genetic Counselor,
Hartford HealthCare Cancer Institute*

born with and in most cases, inherited from a parent.

Those with a hereditary cancer gene mutation have an increased likelihood of developing cancer compared to a person in the general population. Carrying a gene mutation does not mean that the person has cancer or that they will definitely develop cancer, but the risk for cancers is elevated enough to warrant additional options for cancer screening and in some cases, surgical interventions to reduce the risk of cancer. Identifying carriers of inherited cancer gene mutations allows healthcare providers to tailor the patient's medical management and healthcare options.

Q. How has the field of cancer genetics evolved in recent years? Are you seeing breakthroughs or advancements?

A. Cancer genetic testing for hereditary cancer was nearly nonexistent in clinical practice just 25 years ago. Today, cancer genetic counseling is appropriate for an estimated 10 percent to 25 percent of patients

with certain cancers. Recent breakthroughs include the identification of more genes known to cause hereditary cancer, newer testing technologies, easier accessibility and health insurance coverage of genetic testing. These breakthroughs have their challenges; however, genetic counselors are well-versed to help patients and other healthcare providers understand the benefits, risks and limitations of the recent advances in cancer genetics.

Q. What role do you think genetics will play in the future of cancer research and treatment?

A. In the near future, it won't be uncommon to sequence hundreds of genes within a cancer to identify patients eligible for targeted personalized therapies and to identify patients with potentially inherited genetic alterations.

Clarifying and interpreting complex genetic test results will continue to be an important role for genetic counselors.

Sara Carroll, MS, CGC, is lead genetic counselor for the Hartford HealthCare Cancer Institute, which receives an average of 150 to 200 referrals per month for patients who are candidates for genetic counseling. She is board-certified as a genetic counselor by the American Board of Genetic Counseling and a member of the National Society of Genetic Counselors and has been a genetic counselor at the Hartford HealthCare Cancer Institute since 2010.

On the cover

Jean M. Weigert, MD, a radiologist specializing in breast-cancer imaging at The Hospital of Central Connecticut, shows an ultrasound image to patient Mona Murphy. Dr. Weigert recently completed a lengthy research study into the efficacy of ultrasonography in detecting breast cancer in women with dense breasts.

HHCCI announces state-of-the-art purchases

The Hartford HealthCare Cancer Institute (HHCCI) is making significant investments in the purchase and upgrade of radiation and imaging technology at locations across the Institute, according to Gene A. Cardarelli, PhD, MPH, DABR, FACMP, director of physics and radiation oncology at HHCCI.

“Because of the scale of our organization and the resources we are able to bring to physicians and patients, we are in the process of making substantial enhancements to our radiation oncology program through the acquisition of state-of-the-art, high-end radiation technology,” Cardarelli said.

Cardarelli said new purchases and upgrades are being made at each of the sites within HHCCI where radiation oncology services are offered, including the cancer programs at Backus Hospital, Hartford Hospital, MidState Medical Center, The Hospital of Central Connecticut (HOCC) and



Hartford HealthCare is making a significant investment in new and upgraded radiation and imaging technology at its cancer centers across the Hartford HealthCare Cancer Institute, including this state-of-the-art TrueBeam linear accelerator. The equipment has been installed at the Institute's newest cancer center facility — the Hartford HealthCare Cancer Institute at The Hospital of Central Connecticut, which is set to open this spring.

Windham Hospital.

In the East Region, which includes Backus and Windham hospitals, plans are under way to introduce new equipment and upgrades throughout the coming year, including:

■ The replacement of the Backus program's 17-year-old Varian 2100 CD with a new system including clinical enhancements. The Varian will be replaced with an ELEKTA Versa HD Digital Linear Accelerator with robotic

HOT TOPICS

Study suggests that bad luck plays a predominant

A research study released last month by the Johns Hopkins Kimmel Cancer



Andrew Salner, MD

Center revealed that two-thirds of the variation in adult cancer risk across many tissue types can be explained primarily through “bad luck” when mutations occur in genes that drive cancer growth. The remaining third of variation in risk is due to traditionally understood risks such as environmental factors and inherited genes, the study found.

The Johns Hopkins scientists based their findings on a statistical model they developed that measured the proportion of cancer risk across many tissue types in which mutations occurred due to the division of stem cells. The findings generated a great deal of discussion and interest on the part of fellow cancer researchers and providers, as well as the mainstream media and public. Many interpreted the findings as a signal that traditional efforts to avoid cancer – such as healthy diet and exercise – have little to no impact on preventing a diagnosis.

“Plus” asked Andrew Salner, MD, medical director of the Hartford HealthCare Cancer Institute at Hartford Hospital, to share his thoughts on the

findings in the Johns Hopkins study and the impression it left with many people that most diagnoses are due simply to “bad luck.”

Drs. Cristian Tomasetti and Bert Vogelstein from Johns Hopkins Medicine published a fascinating study in *Science* in January 2015, which explored the etiology of cancer.

In the past, scientists have estimated that one-half to two-thirds of all cancers may be related to lifestyle issues over which the person has some control, such as tobacco use, obesity, overexposure to the sun and lack of physical activity. In the current study, using a complex statistical model,