One Life Saved, Another Begun

PLUS +
- The Links Between Breast and Ovarian Cancers
- Why Tissue Research Matters
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About the cover
Allison Bellevue, pictured with her husband,
Ruyter, and her son, Lucas, was diagnosed
with ovarian cancer while pregnant. Read
her story on page 22.
The Susan F. Smith Center for Women's Cancers at Dana-Farber/Brigham and Women's Cancer Center unites many of the world's leading experts in breast and gynecologic cancers with one common goal: to give women the latest, most promising treatments and care, including innovative therapies that are often available only through clinical research trials. Physicians in the Susan Smith Center are deeply committed not only to providing expert, compassionate care, but also to active clinical research designed to benefit both current patients and future generations of women.

In addition to offering the latest treatments, the center provides other services, such as support groups and integrative therapies, to help meet the diverse needs of women facing cancer.

The idea for the Susan Smith Center arose in a meeting between David Livingston, MD, and Dana-Farber trustee Susan F. Smith, in which Dr. Livingston suggested combining the Institute's then-separate breast and gynecologic cancer programs. This notion of a center dedicated to studying and treating all women's cancers captured Mrs. Smith's imagination. Her determination to make the center a reality – along with the strong support of many other individuals and organizations – has been a steady force behind its growth.

The Smith Center's clinical areas now occupy two floors of Dana-Farber's Yawkey Center for Cancer Care. The center's physicians and scientists don't have to travel far to meet. An enclosed bridge connects clinical units with corresponding units in the Richard A. and Susan F. Smith Research laboratories – a proximity designed to help speed the conversion of scientific advances into new treatments.
Almost 300,000 women in the United States will learn this year that they have breast or gynecologic cancer, and the Susan F. Smith Center (SSC) for Women’s Cancers at Dana-Farber is poised to help – either directly through patient care, or indirectly through research and teaching.

This edition of Turning Point showcases the many ways that experts in all types of women’s cancers share their knowledge, research, and clinical expertise, creating a common ground for excellence.

The cancer care and research collaborative at Dana-Farber that we know today as the Susan F. Smith Center for Women’s Cancers (SSC) was founded because cancers of the breast and female reproductive tract often unite women in a sisterhood of shared concern and experience. Cancers in these two sites also share fundamental biology and genetics.

When we joined together, we learned that certain cancers once thought to be radically different – because they arose in different tissues and organs – may actually harbor surprising similarities at a basic biological level.

Today, nearly 20 years since the SSC was first created, we continue to learn from one another. The center sponsors an annual Symposium on Women’s Cancers to facilitate this knowledge exchange. To discuss clinical initiatives in surgery, medical oncology, radiology, and other important disciplines, the SSC offers continuing medical education courses for doctors and other providers who care for patients with breast cancer and a wide range of gynecologic cancers. And, of course, Turning Point is an important way to share what we know about these diseases and some of the multifaceted work that takes place in our center.

Investigators are exploring genetic similarities among certain breast and gynecologic cancers to develop novel and increasingly effective therapies. Here are a few examples:

- Triple-negative breast cancer and high-grade serous ovarian cancer, though different diseases, can have some genetic similarities.
- Cisplatin, a drug used to combat ovarian cancer, is being studied for its effectiveness against triple-negative breast cancer.
- The PI3 kinase protein is involved in a pathway that is frequently altered in certain breast and ovarian cancers. We are conducting clinical trials in women with breast or ovarian cancers that have PI3 kinase alterations.
- Women with a *BRCA1* or *BRCA2* gene mutation have a lifetime risk of 60 percent for breast cancer and between 15 and 40 percent for ovarian cancer.

The Value of Clinical Trials

Clinical trials – in which the safety and effectiveness of new drugs are tested in patients – are links in the chain of laboratory discoveries, drug development, and clinical application, and they lead to the advent of many targeted therapies. We have nearly 90 clinical trials currently under way at the SSC (see page 5).

Dana-Farber’s Ian Krop, MD, PhD, serves as clinical trials director in breast cancer, and Ursula Matulonis, MD, leads the Institute’s clinical research in gynecologic cancer. Because there is overlap between certain breast and ovarian cancers, some of the new agents are of interest to investigators in both areas, and the two groups conduct trials together.

Eric Winer, MD, director of the Breast...
Oncology Center at Dana-Farber/Brigham and Women’s Cancer Center (DF/BWCC), is overseeing a fund called Accelerating Clinical Trials Now in Our Women’s Cancers Program (ACT NOW), which will support trials designed to identify patients who will most likely benefit from new drugs. In some cases, tumor tissue will be collected before and after treatment to study the molecular impact of the treatment and correlate these changes with the degree of benefit experienced by the patient. ACT NOW is intended to support some of the most interesting trials that may otherwise be underfunded or unfunded.

All About Sharing

Animal models used for cancer research show what can happen in the development of cancer, but only human tissue reveals what does happen. SSC scientists are fortunate to be able to study the origins of tumors through a bank of blood and tumor tissue donated by patients at DF/BWCC.

The Tissue Resource for Research (TRR), which includes samples donated by patients with breast, ovarian, or endometrial cancer, provides a growing body of information for Dana-Farber investigators and collaborating scientists from across the U.S. and around the world. This valuable resource began in 2000 and expanded in 2010 with funding from the SSC Executive Council.

“The extent of cross-disciplinary research we’re able to do has risen dramatically because of this resource,” says J. Dirk Iglehart, MD, the SSC’s director (see page 17 for more on TRR). Just as Dana-Farber scientists share the TRR with colleagues from around the world, so do they share knowledge with their counterparts from other countries (see page 14). The International Fellowship program in breast oncology, launched in 2012, hosts fellows from such countries as Australia and Brazil. By bringing Dana-Farber expertise back home after their training is complete, these doctors can improve the care of women worldwide. In addition, SSC physicians are providing expertise and consultation, by telephone and email, to colleagues in Rwanda and Haiti, two countries where Dana-Farber has focused its global health mission.

2012 Highlights

- The Dana-Farber/Harvard Cancer Center Men’s Collaborative to Cure Women’s Cancers delivered its first round of funding to support five projects aimed at uncovering more information about the ways cancer cells respond or develop resistance to chemotherapy.

- Kornelia Polyak, MD, PhD, received the Paul Marks Prize for Cancer Research, a biennial award honoring young scientists for their contributions to cancer research.

- The PI3 kinase “Dream Team,” which includes a mix of scientists and clinicians who specialize in breast and gynecologic cancers, was again chosen to receive funding from the nonprofit Stand Up To Cancer. The team will further explore how to shut down this protein that allows cancer to grow.

- President Barack Obama appointed Judy Garber, MD, MPH, to the National Cancer Advisory Board.

- The Susan F. Smith Center marked a decade of presenting its annual course on controversies and new horizons in breast cancer. The educational event, now led by Harold Burstein, MD, PhD, attracts hundreds of breast cancer clinicians from around the world.
What effect does pregnancy have on breast cancer risk?

In some cases, pregnancy protects a woman from breast cancer, while in others it may put her at risk.

A woman’s breast cells are immature and underdeveloped until her first, full-term pregnancy. Then, a hormone – human chorionic gonadotropin – causes breast cells to mature and protects against breast cancer by triggering permanent genetic changes in the mammary glands.

Because their breast cells mature sooner, women who have their first child at a younger age have a lower lifetime risk of developing breast cancer than women who become mothers later. In fact, women who give birth for the first time by age 20 cut their breast cancer risk in half compared to those who do so after age 35. In addition, the risk of breast cancer declines with each birth. A mother five times over, or more, has half the risk of developing breast cancer as a woman who has never given birth.

Some factors associated with pregnancy, however, can increase a woman’s risk of breast cancer. Women who become pregnant after age 35 or who never become pregnant are exposed to more estrogen over their lifetime, which may contribute to the risk of breast cancer.

Many survivors are concerned about the safety of pregnancy after they have been treated for breast cancer, because there is a theoretical concern that higher levels of estrogen and progesterone experienced during pregnancy may fuel the growth of any residual cancer cells and lead to recurrence.

“Research to date, however, has not demonstrated increased rates of recurrence in breast cancer survivors who become pregnant compared to breast cancer survivors who do not get pregnant,” says Erica Mayer, MD, MPH, a breast oncologist at Dana-Farber/Brigham and Women’s Cancer Center (DF/BWCC) who studies pregnancy-associated breast cancer. “In fact, pregnant women have lower rates of recurrence than other breast cancer patients.”

She says most oncologists typically recommend that survivors wait two or three years after their diagnosis and treatment to consider getting pregnant, and if taking tamoxifen (a drug that minimizes the chance of cancer returning), discuss their plans with their doctors.
Clinical trials are scientific studies in which new treatments – drugs, diagnostic procedures, and other therapies – are tested in patients to find out if they are safe and effective. These studies help scientists answer questions about new therapies. Nearly all cancer drugs in use today were tested and made available to patients through clinical trials. “None of the advances made in breast cancer, or any cancer, could have happened without patients volunteering for clinical trials,” says DF/BWCC breast oncologist Ian Krop, MD, PhD. Currently, there are about 90 clinical trials under way at Dana-Farber’s Susan F. Smith Center for Women’s Cancers.

Patients benefit from clinical trials on several levels. In addition to directly aiding individual patients, trials also help doctors develop better treatments for current and future patients.

Access to a larger treatment team is another advantage because clinicians, researchers, research coordinators, research nurses, technicians, social workers, support staff, and other health-care professionals work together on a patient’s care. Studies show that this extra attention can enhance patient outcomes.

While new treatments evaluated through clinical trials could potentially be better than standard treatments, there are no guarantees.

“We don’t know if a new therapy is actually better,” says Dr. Krop. “That’s why it’s being tested. But, given improvements in technology and our understanding of cancer at the molecular level, there has been gradual improvement, through clinical trials, in our ability to develop drugs that work more effectively and reduce toxicity.”

To learn more about clinical trials at Dana-Farber, visit www.dana-farber.org/clinicaltrials.

Clinical trials for breast or gyn patients

Susan F. Smith Center physician/scientists currently lead more than 90 clinical trials for patients with many types of women’s cancer, at various stages. They include:

- Early-stage breast cancer
- Metastatic breast cancer
- Breast cancer prevention
- Cervical cancer
- Endometrial/uterine cancer
- Ovarian, fallopian, peritoneal cancer
- Vulvar cancer

For a complete list, visit Dana-Farber’s clinical trials Web page at www.dana-farber.org/clinicaltrials. Search under the “Adult” list for your type of cancer. If you find a clinical trial for which you might qualify, talk with your oncologist. These clinical trials are open to Dana-Farber patients and, sometimes, to patients at other hospitals that participate in Dana-Farber/Harvard Cancer Center.

Elizabeth Cahn, above left, was in a research study evaluating treatments for triple negative breast cancer, and her mother is now in a clinical trial for lymphoma. Karen Schulte, NP, provides follow-up care for Cahn, and gathers outcomes data as part of the trial.
Dr. Partridge Brings Survivorship to the Forefront

It’s been a busy year for Dana-Farber’s Ann Partridge, MD, MPH. In early 2012, she was named director of the Adult Survivorship Program at Dana-Farber/Brigham and Women’s Cancer Center (DF/BWCC), adding another title to an already impressive track record. Dr. Partridge formerly served as clinical director of the Breast Oncology Program in the Susan F. Smith Center for Women’s Cancers, and she leads DF/BWCC’s Program for Young Women with Breast Cancer.

The new position in the Adult Survivorship Program is a likely venture for Dr. Partridge, who is nationally recognized for her contributions to the fields of breast cancer in young women and cancer survivorship. She has been working for the past year to integrate survivorship services into treatment areas throughout DF/BWCC.

“We want to ensure that survivorship has a prominent place in the spectrum of care that patients receive here,” Dr. Partridge says. “At comprehensive cancer centers like Dana-Farber, patients have a team of specialists that includes not just doctors and nurses, but also nutritionists, social workers, and other experts. I believe that survivorship services also need to be delivered in this type of comprehensive, personalized fashion, so that we’re giving patients expert survivorship care in the same way that we provide outstanding cancer care.”

Partridge and her team help health care providers start introducing the basics of survivorship even as patients are being treated for cancer.
Lung Cancer Drug Shows Promise Against Vulvar Cancer

A drug that gained fame as a treatment for certain types of lung cancer is showing its mettle against cancer of the vulva as well.

In a recent clinical trial, investigators led by Dana-Farber’s Neil Horowitz, MD, and Ursula Matulonis, MD, found that the drug Tarceva temporarily stalled or reversed the growth of squamous cell vulvar cancers in some women with the disease. The trial marked the first time a “targeted” therapy, which aims at a specific abnormal protein in cancer cells, has been tested in patients with vulvar cancer.

The results are particularly welcome in a disease which, because of its relative rarity, hasn’t received as much research funding as other cancers. Every year, an estimated 4,000 women in the United States are diagnosed with the disease, and 1,000 die of it. While many patients can be cured by a combination of surgery and chemotherapy or radiation therapy, others – particularly those whose cancer has metastasized to other parts of the body – don’t fare as well.

The trial sprang from the discovery that vulvar cancer cells often have an increased expression of a protein known as EGFR – the same protein found in excess in non-small cell lung cancers (NSCLCs), and the very protein targeted by Tarceva. When used in certain patients with NSCLC, Tarceva often produces remissions that last well over a year.

“The results in non-small cell lung cancer caused us to ask whether Tarceva could have an effect in vulvar cancer patients as well,” Dr. Horowitz says. The trial included patients whose cancer was limited to the vulva as well as those whose cancer had spread. Almost 28 percent of the participants had a “partial response” to Tarceva – meaning their tumors measurably shrank – and 40 percent had no worsening of the disease.

Although these benefits generally lasted only a few months, they demonstrate the promise of targeted drugs for a disease which remains very difficult to treat once it has spread beyond its site of origin, Dr. Horowitz remarks. Encouragingly, all the participants whose tumor cells had surplus EGFR had a partial response or stable disease when treated with Tarceva.

Pending additional funding, Dr. Horowitz hopes to test Tarceva in combination with drugs that can starve tumors of an adequate blood supply.
News Roundup

Tamoxifen Benefits are Stronger at 10 Years

A report at the annual San Antonio Breast Cancer Symposium recommended a change in the way one of the oldest breast cancer medications, tamoxifen, is prescribed. Leaders of the ATLAS trial, which involved thousands of breast cancer patients worldwide, reported that patients with estrogen receptor-positive breast cancer who took tamoxifen for 10 years had a higher survival rate and lower chance of recurrence than those who took the medication for five years.

“Although the benefits became apparent during the five additional years that one group took tamoxifen, the advantages became even greater after the 10-year group went off-therapy,” says Eric Winer, MD, director, Breast Oncology Center.

For post-menopausal women with breast cancer, Susan Smith Center oncologists generally don’t rely on tamoxifen as the only treatment to prevent relapse, Dr. Winer points out. They either use aromatase inhibitors instead of tamoxifen or a sequential approach of tamoxifen followed by an aromatase inhibitor. “We’re eager to see the results of ongoing studies of the effect of extending aromatase inhibitor therapy beyond five years in post-menopausal women,” he says.

In pre-menopausal women – particularly those who were pre-menopausal at diagnosis and at completion of tamoxifen therapy – the study suggests that the new standard of care is 10 years of tamoxifen, unless these younger women have severe side effects to the medication, or a very low risk of recurrence.

The study found that extended tamoxifen use was associated with a 1.6 percent increase in endometrial cancer risk. “Most of that risk, we know from previous studies, pertains to post-menopausal women,” says Dr. Winer. “Since the number of deaths from endometrial cancer is very small, the benefits of extended therapy still outweigh the risks for most patients.”

Ask The Nutritionist:
Recipes for Fighting Cancer

This free app from Dana-Farber features:
• More than 100 healthy recipes and nutrition tips
• Recipes to manage cancer-related side effects
• Q&As with professional nutrition experts
• Ability to create shopping lists to take to the grocery store

To download the app, scan the QR code, visit the iTunes App Store, or go to www.dana-farber.org/nutritionapp.
Effective Care Is Not Always Focused on Cure

To ease the many complications of cancer – physical, emotional, or logistical – Dana-Farber offers a variety of programs and services that focus on quality of life instead of cure.

One source of help is the Institute’s Adult Palliative Care Program.

Staffed by a physician, nurse practitioner, and nurse specialist, the program helps patients live as well as possible during the course of their care, from the time of diagnosis to the conclusion of treatment.

“Physicians or other members of the clinic staff refer patients who they feel can particularly benefit from our services,” says Program Director Douglas Brandoff, MD, who serves as the “point person” for patients in the Susan F. Smith Center for Women’s Cancers. “Those services fall into three broad categories: helping patients manage pain and other physical symptoms, such as nausea, poor appetite, difficulty breathing, or sleeplessness; providing emotional support and connections to social workers and specialists in anxiety or depression, when indicated; and helping patients determine how their health-care needs can best be met.”

Palliative experts work closely with fellow caregivers. “Palliative care is appropriate at any stage of illness,” Dr. Brandoff asserts, “It helps patients clarify their hopes, goals, and fears, and manage their symptoms. Our goal is to provide comfort by working to control pain and help patients preserve their dignity – all while staying in active communication with their families and health care team."

Crossover Drugs Expand Fight Against Different Cancers

Thanks to a better understanding of the genetics of cancer, some drugs originally developed to treat women’s cancers have been used against certain other cancers. And drugs first intended to treat other cancers are entering the arsenal of women’s cancers therapies.

Herceptin, for example, is prescribed for women with HER2-positive breast cancer, a malignancy in which cancer cells have high amounts of the protein Her2 on their surface. Research has shown that some other cancers can have a Her2 surplus as well. Today, herceptin is also approved for the treatment of Her2-positive metastatic cancer of the stomach or the region where the stomach meets the esophagus.

Similarly, everolimus, a drug that started out as a treatment for other cancers, is now used in breast cancer. Originally intended for advanced renal cell carcinoma, a form of kidney cancer, everolimus can also be used for a type of advanced breast cancer that has already been treated with at least one other medication. The discovery of basic genetic similarities between these forms of kidney and breast cancer led to tests of the drug’s effectiveness against both diseases.

Everolimus may have a preventive effect, as well. In a multicenter study, Dana-Farber’s Judy Garber, MD, MPH, and Kornelia Polyak, MD, PhD, are testing its ability to protect women with certain genetic mutations, both before and after preventive mastectomy, from breast cancer.

“Based on the results of genome-wide profiling studies, it is becoming more and more evident that there are a limited number of key pathways involved in the formation of cancer,” Dr. Polyak remarks. “Thus, it is not surprising that the same pathway plays a role in different tumor types and at different stages of tumor development. Inhibition of this pathway is likely to be effective for the treatment and prevention of a large range of tumors, including hereditary breast cancer.”

Another drug that may cross over to women’s cancer is bortezomib, used for patients with the blood cancer multiple myeloma, says J. Dirk Iglehart, MD, director of the Susan F. Smith Center. Researchers at Dana-Farber are investigating whether combining bortezomib with a type of drug known as a PARP inhibitor will be effective against certain varieties of breast cancer.
Searching for Similarities
certain cancers have genetic commonalities

by Robert Levy
Ovarian cancer and breast cancer may both arise in women, but they aren’t exactly sister diseases. Aside from the fact that they begin in an organ and gland related to reproduction, they don’t initially appear to have much in common.

Consider: Breast cancers are often diagnosed at an early stage of growth, while ovarian cancers usually aren’t detected until they’re more advanced. When breast cancers spread to other parts of the body, they tend to favor the bones, lungs, or liver; ovarian cancers usually travel to the surface of organs in the abdomen.

Yet for many years there have been hints that a few specific types of breast and ovarian cancer do have a distant kinship. The evidence isn’t necessarily found in the way the diseases behave, how reliably they’re detected in screening tests, or how they metastasize. Rather, the common element seems to lie at the bedrock level of their DNA – in inherited gene mutations that allow tumor cells to form and take root in the body.

The first suggestion of a genetic link came in the 1990s among studies of women who inherited mutations in the genes BRCA1 or BRCA2. Researchers found that such women had not only an increased risk of developing breast cancer – BRCA stands for BReast CAncer susceptibility – but also an increased risk of ovarian cancer (and certain other cancers).

“We know that women with inherited BRCA1 or 2 mutations have about a 40-80 percent chance of developing breast cancer during their lifetimes, and a much-increased chance of developing ovarian cancer as well,” says Judy Garber, MD, MPH, director of Dana-Farber’s Center for Cancer Genetics and Prevention. “In both cases, it’s far higher than the normal lifetime risk for these diseases.

“The BRCA1 and 2 data told us that, for this group of women, breast and ovarian cancers may develop at least partly through the same genetic pathways,” she continues. “The question then became, ‘What is the mechanism by which mutations in BRCA1 or 2 lead to cancer?’”

Subsequent research – much of it led by Dana-Farber’s David Livingston, MD – revealed that the BRCA genes normally protect against cancer by repairing damaged sections of DNA within cells. When mutations hinder BRCA from doing its job, the damage persists, wrecking the cells’ instructions for orderly division, and pushing cells one step closer to becoming cancerous.

If BRCA-related breast and ovarian cancers had a common cause, there might be a common approach to preventing them or catching them at the earliest stage. Women who test positive for BRCA1 or 2 mutations are often advised to receive more frequent screening tests: mammograms for breast cancer; ultrasound, blood tests, and clinical exams for ovarian cancer. One preventive option is pre-emptive surgery – removal of the breasts, ovaries, and fallopian tubes to deny cancer a starting point. Another option is medicinal: oral contraceptives reduce ovarian cancer risk in women carrying a BRCA1 or 2 mutation, but their effect on breast cancer risk is unclear.

Even as doctors and patients pursued these strategies, research was beginning to show that such cancers could also be treated by the same type of chemotherapy drug. “There

Certain Breast and Ovarian Cancers Have Genetic Commonalities
have been consistent data over a long period of time that platinum-based drugs, such as cisplatin, work better against ovarian cancers in women carrying BRCA mutations than against ovarian tumors in women without these mutations,” Dr. Garber explains. “Therefore, we decided to ask whether platinum drugs could also be more effective in certain breast cancers with BRCA mutations.”

She and her associates first focused on “triple-negative” breast cancer, named for its ability to grow without three major growth-stimulating hormones and proteins. Most BRCA1-mutated breast cancers are triple-negative. With colleagues Daniel Silver, MD, and Andrea Richardson, MD, PhD, Dr. Garber led the first clinical trial in which patients with triple-negative breast cancer were treated with four doses of cisplatin before surgery. In 22 percent of the participants, no traces of cancer remained following surgery. In 22 percent of the participants, no traces of cancer remained following surgery.

Drs. Richardson, Silver, and others carried the research a step further when they examined tumor tissue removed from the patients who participated in the trials. Their analysis revealed a “biomarker” – a pattern of missing copies of chromosomes within the tumor cells – that indicates which triple-negative cancers are likely to succumb to platinum-based therapies.

The research represents an important advance for treatment of triple-negative breast cancer, the researchers say. Although the disease can often be treated successfully by standard chemotherapy drugs, patients who aren't helped by such drugs have had few good alternatives. Researchers have opened a clinical trial comparing platinum to standard chemotherapy for newly diagnosed breast cancers in women with BRCA1 or 2 mutations.

The Ovarian Connection

These genetic parallels are propelling new approaches to ovarian cancer treatment, as well.

“We know that triple-negative breast cancers often have a mutation in BRCA1,” says Ursula Matulonis, MD, medical director of Gynecologic Oncology at Dana-Farber/Brigham and Women's Cancer Center (DF/BWCC). “And patients with high-grade serous ovarian cancer – the most common form of ovarian cancer – often carry inherited mutations in either BRCA1 and 2. This led researchers to test whether drugs aimed at these specific genetic weaknesses would be effective against both diseases.”

The logic behind this approach is easily grasped: Cancer cells with defective BRCA genes may proliferate rapidly, but they’re also uniquely vulnerable, because the lack of able-bodied BRCA hampers their ability to repair DNA damage. Some of the first drugs employed to take advantage of this vulnerability were platinum agents such as cisplatin, which damage DNA.

There are other DNA-repair systems in cells, but they’re no substitute for functioning BRCA. Blocking these systems with a drug compound might hamper DNA repair so severely that the tumor cell could no longer survive. It would be like
knocking another leg off a table that is already missing one.

A newer class of drugs known as PARP inhibitors is designed to do just that. By interfering with an enzyme known as PARP, which is needed for proper DNA repair, these drugs can further erode the DNA-repairing abilities of tumor cells with non-functional BRCA genes.

PARP inhibitors may work in tandem with other targeted drugs. Scientists at Beth Israel Deaconess Medical Center ran studies combining a PARP inhibitor and an inhibitor of another enzyme, known as PI3 kinase, in mice. They found that the drug duo produced extensive killing of cancer cells in the animals, in some cases leading to cures.

With these findings as a base, Dr. Matulonis and her colleagues have opened a phase 1 clinical trial of the two inhibitors for women with high-grade ovarian cancer or triple-negative breast cancer that has recurred after treatment, and for breast or ovarian cancer patients whose tumors carry a BRCA1 or BRCA2 mutation. This early-phase trial, largely funded by a Stand Up To Cancer grant, is being led by Dana-Farber, which is collaborating on the effort with several other major cancer centers nationwide. The clinical trial aims to determine the correct dose of the drugs and monitor their safety. Later phases will focus on the drugs’ effectiveness.

“We’re reaching the point where we need to start thinking about these two diseases in a like-minded way because of their underlying genetic similarities,” Dr. Matulonis remarks.

Dealing a Double Blow

The notion of using drugs to deliver a finishing blow to cancer cells whose DNA damage-repair machinery is already weakened – a concept known as synthetic lethality – is being explored in several types of cancer, including breast and ovarian. "The analogy of the table with a missing leg is becoming increasingly appealing in designing treatments,” says J. Dirk Iglehart, MD, director of the Susan F. Smith Center for Women’s Cancers at DF/BWCC.

Geoffrey Shapiro, MD, PhD, and Alan D’Andrea, MD, are exploring whether cancer cells are susceptible to drugs that target DNA repair mechanisms even if the cells’ BRCA genes aren’t mutated. Their strategy is two-fold: cripple BRCA1 with a drug that blocks an enzyme needed by BRCA1, and add a PARP inhibitor to further impede DNA-repair. The approach worked so well in the laboratory that it is now being used in a phase 1 clinical trial for patients with lung, breast, ovarian, or other cancers not linked to BRCA.

Drs. Garber, Shapiro, and D’Andrea are taking a similar tack in studies involving two drugs. One is a very new enzyme inhibitor that targets a key step in BRCA1 function; the second is the older drug bortezomib, which has traditionally been used to treat multiple myeloma. The team is exploring whether these drugs can prevent a DNA-repair pathway from switching on, and then combining it with a PARP inhibitor to gauge its effect on different types of cancer cells.

The promise of these approaches is spurring a range of studies.

"In an application for a major research grant from the National Cancer Institute, DF/BWCC scientists and clinicians came together to create two projects that involve new treatments for triple-negative breast cancer,” says Eric Winer, MD, director, DF/BWCC’s Breast Oncology Center, who has led trials of a variety of breast cancer therapies. “One of these involves approaches developed by Drs. D’Andrea and Shapiro, and the other is based on work by Dr. Kornelia Polyak.”

Adds Dr. Iglehart, "As we learn more about the genomic landscape of breast and ovarian cancers, we’re likely to discover more points of similarity between the two diseases. That opens the possibility of new approaches to treatment."
It’s a Small World
An act of gumption, a spark of inspiration, and a family's generosity have combined to create a new spirit of internationalism at the Susan F. Smith Center for Women's Cancers.

The first step occurred, as it does in many medical and scientific collaborations, at a conference – this one in Melbourne, Australia, in 2007, for breast cancer scientists and physicians from around the world. Eric Winer, MD, director of the Breast Oncology Center at DF/BWCC, was one of the speakers, and Elgene Lim, MD, a PhD student at an Australian research institute, was in the audience.

When Dr. Winer finished speaking, Dr. Lim introduced himself and spoke of his interest in doing postdoctoral training in the United States. Dr. Winer invited him to visit Dana-Farber when schedules allowed.

The opportunity arose a few years later, when Dr. Lim attended an annual meeting of the American Society of Clinical Oncology, in Chicago. He made a 1,000-mile side trip to Dana-Farber and was “blown away,” in his words, by what he saw.

“As a PhD student, you look for ways to get more training, because there’s so much to learn,” Dr. Lim says. “Boston is like Athens in its glory days, the capital of the academic world.”

Dr. Lim was able to cobble together funding from Fulbright and Australian government scholarships, and with help from Dr. Winer, to support his training at DF/BWCC for two years. He began working here in 2010, spending about 30 percent of his time seeing patients with Dr. Winer, and 70 percent doing research in the lab of Myles Brown, MD.

In 2012, he was promoted to instructor in medicine. He conducts research into the differences in estrogen signaling in normal and breast cancer tissue. He also has established mouse models of human breast cancer to evaluate potential new therapies for the disease.

If the experience has been valuable for Dr. Lim, it’s been just as fruitful for his Dana-Farber colleagues. “It’s remarkable how smoothly Elgene has fit in with our group and how well he complements the work we do here,” Dr. Winer remarks. “His training is impeccable. He may be from the other side of the world, but his values mesh entirely with ours.”

Fellowship Program Begins

The arrangement worked so well that it became the inspiration for an international fellowship program in breast cancer research and treatment at the Susan F. Smith Center.

“Teaching is a key part of Dana-Farber’s mission,” Dr. Winer relates. “After Elgene had been here about a year, I saw that we had in place all the elements of a formal training program for promising physician-scientists from overseas.”

With financial support from longtime Dana-Farber benefactors Bill and Maureen Goldfarb, the Goldfarb and Rudkin Family Fellowship was established in 2011.

The first recipient was Otto Metzger Filho, MD, of Brazil, and the 2012 recipient is Shom Goel, MD, of Australia. Fellows spend two to three years at the center, dividing their time between research and clinical work.
A Winning Combination

Drs. Metzger and Goel say they were drawn to the fellowship by the opportunity to combine research and patient care – and, not coincidentally, work with people at the top of their field. Most advances in breast cancer therapeutics have stemmed from our heightened understanding of the biology of the disease,” Dr. Goel observes. “The connection between the lab and the clinic has never been more important.”

Dr. Metzger did his medical training in his native Brazil before heading to the Jules Bordet Institute in Brussels, where he worked on a large clinical trial of a new cancer drug and studied the molecular roots of lobular carcinoma, which accounts for approximately 10 percent of all breast cancer cases.

At DF/BWCC, he has helped analyze data on a clinical trial comparing the drug tamoxifen and an estrogen-lowering medication in patients with lobular carcinoma. He is also working with laboratory scientists to understand the genetic circuitry of lobular carcinomas and how it can be altered by different therapies.

In addition, Dr. Metzger is working with Nancy Lin, MD, Ian Krop, MD, PhD, and Dr. Winer on new treatments for estrogen receptor-positive breast cancer. And he’s collaborating with Erica Mayer, MD, on testing a new way to capture information on the side effects of drugs in clinical trials.

Dr. Goel attended medical school in Adelaide, Australia, and finished his medical residency and oncology fellowship in Sydney before embarking on a PhD program in basic tumor biology. He moved to Boston in 2009, working in the lab of Rakesh Jain, PhD, at Massachusetts General Hospital, studying how tumors form new blood vessels and interact with surrounding tissue.

At Dana-Farber, he has joined the lab of Jean Zhao, PhD, where he studies why some breast cancers become
resistant to drugs like trastuzumab (Herceptin), which close off a key growth switch on tumor cells.

In addition to their research responsibilities, Drs. Metzger and Goel spend one day a week with physicians seeing patients in the breast cancer clinic at DF/BWCC. “The clinic and the laboratory are separated by only about 20 meters,” Dr. Goel says. “To me, that’s the embodiment of translational research – of bringing ideas from the lab to help patients.”

Here and Back
Working in DF/BWCC’s labs and clinics has provided Drs. Metzger and Goel with ample opportunities to compare the research and patient care here with practices in their own countries – and to bring their newfound knowledge back home.

“In Brazil, various aspects of care aren’t integrated as well as they are here,” Dr. Metzger remarks. “Once patients come to DF/BWCC, their treatment plan is truly comprehensive.”

For Dr. Goel, the most notable difference can be summarized in two words: clinical trials. “The access that patients here have to clinical trials and new therapies is unprecedented in my experience.”

Looking back on his own fellowship, Dr. Lim points to the less hierarchical nature of American science and medicine, where clinicians and scientists work in partnership. “It has been liberating to work in an environment that encourages independent thinking and allows a young investigator to flourish,” he observes.

The hope that international fellows will use what they’ve learned here to improve health care in their own countries was central to the fellowship’s creation. “The fellows extend what we’re able to do; they bring energy and new ideas,” Dr. Winer comments. “Since the program is only a couple of years old, we don’t know how the experience in Boston will influence their careers. But we certainly hope the relationships will lead to lifelong collaborations.”

Whether or not the fellowship program leads to health care improvements in the fellows’ home countries, there’s little question that it has altered career paths for participants.

For Dr. Winer, the program has provided a chance to recreate, on a small scale, the benefits he has experienced working with colleagues overseas. “One of the most gratifying aspects of my job has been the chance to collaborate with clinicians and scientists around the world,” he states. I hope this program can help the fellows find the same rewards.”

Hands Across the World
In addition to the two-year international fellowships, another program is shaped by the interests and timetables of foreign breast cancer surgeons who want to gain some experience at Dana-Farber/Brigham and Women’s Cancer Center (DF/BWCC).

“We can adapt the program to the time commitment that visiting physicians are able to make – whether a week or a year – and tailor it to what they hope to learn,” says the program’s creator, Mehra Golshan, MD, director of Breast Surgical Services at DF/BWCC. We provide a comprehensive experience in surgical, medical, imaging, and radiation breast oncology. The program has the flexibility to meet their needs.” Graduates of the program include breast cancer physicians from Korea, China, Japan, Taiwan, India, Iran, Lebanon, Egypt, Saudi Arabia, Germany, Italy, the United Kingdom, and Kenya.

“Hands Across the World” is a program that provides foreign breast cancer surgeons with an opportunity to gain some experience at Dana-Farber/Brigham and Women’s Cancer Center (DF/BWCC).

Graduates of the program include breast cancer physicians from Korea, China, Japan, Taiwan, India, Iran, Lebanon, Egypt, Saudi Arabia, Germany, Italy, the United Kingdom, and Kenya.
Only by studying thousands of breast tumors did researchers discover that about 25 percent carry extra copies of a gene called HER2. This type of breast cancer, known as HER2-positive, behaves differently from other types. After analyzing HER2-positive tumors, scientists were able to develop diagnostic tests that are now commonly used to determine whether a breast tumor is HER2-positive. They also designed a targeted drug that slows the growth of these tumors and improves outcomes for patients.

Much of the work that led to the HER2 discovery began with a young, energetic surgeon at Duke University who collected human tissue samples for the scientists to study. Today, that surgeon, J. Dirk Iglehart, MD, chief of surgical oncology and director of the Susan F. Smith Center for Women's Cancers at Dana-Farber/Brigham and Women's Cancer Center (DF/BWCC), says human tissue is a critical component of cancer research. “If you're going to determine what causes cancer, you have to study human cancer tissue,” says Dr. Iglehart. “Everything we know about genes that cause cancer or predispose one to cancer comes from the study of patient material—tissue, fluid, and blood.”

Precious Resources

Tissue samples donated by patients are among medical researchers’ most precious resources. Both basic and translational research depend on it: investigators can identify genetic mutations and abnormal cell proteins, and gather valuable new information about the pathways involved in cancer development – all from tissue samples.

Until recently, however, tissue removed from consenting patients during surgery and other procedures was not preserved. In fact, outside of Dana-Farber and other research centers, tissue banking is not a part of routine medical practice, largely due to the special, costly storage requirements and detailed protocols for collecting and preparing cancer tissue samples for study.

At Dana-Farber, the Tissue Resource for Research (TRR), made possible with generous gifts from the Susan F. Smith Center’s Executive Council, significantly
Tissue Donation Can Provide a Silver Lining

Amy Tull Atwood believes in silver linings. For Atwood, a 39-year-old breast cancer survivor, donating tissue during her treatment for breast cancer was an opportunity to do good in a bad situation.

"Working at Genzyme [a pharmaceutical company based in Cambridge, Mass.], I know the value of research and clinical trials," says Atwood. "So I was very willing to donate my tissue to help doctors develop new treatments and potential cures for breast cancer."

After performing a breast self-exam last March, Atwood discovered a lump in one of her breasts. A subsequent mammogram detected two lumps in her right breast, and a biopsy showed invasive ductal carcinoma, the most common type of breast cancer. Wanting to do everything possible to eliminate the cancer, she opted for a double mastectomy. During surgery, her doctors discovered the cancer had spread to her lymph nodes, so treatment included two 12-week courses of chemotherapy and six weeks of radiation therapy.

Soon after her diagnosis, her doctors at Dana-Farber asked if she was interested in donating her breast tissue or blood during surgery. Atwood didn’t hesitate.

"With something as noninvasive as tissue donation, why not do it?" she asks. "They’re taking it out during surgery anyway, so it’s not a big deal to donate it for science."

Several years ago, Atwood started writing a travel blog (www.amysamerica.com) during an 83-day car trip around the country. She resurrected it after her diagnosis to keep family and friends updated on her progress and, more importantly, she says, to help others in similar circumstances know that they are not alone.

Despite the traumatic experience of breast cancer, tissue donation was a logical step for Atwood. "Everything happens for a reason," she says. "If the reason is so other women don’t have to have a similar experience, then I’m all for it."

Before the TRR was established, “scientists had little or no access to fresh human tissue, so activities such as cancer stem cell research, sorting cell types, and studying the tissue around tumors were all limited,” says Andrea Richardson, MD, PhD, a DF/BWCC surgical pathologist who oversees the TRR. Today, the TRR allows basic scientists to take their exploration of the roots of breast and gynecologic cancers to the next level, when their findings help create new treatments to test with patients.

expands the Institute’s ability to collect and bank samples of tissue, blood, fluid, and other biologic materials donated by consenting patients with breast or gynecologic cancer. Tissue that has been extracted from both primary and metastatic tumors can be frozen, stored, and made available for study. The breast bank now contains several thousand specimens from more than a thousand patients, and holdings of ovarian and endometrial tissue continue to increase.
Most research into the underlying mechanisms of cancer entail tissue samples, and women's cancers are no exception.

For nearly a decade, pathologists have been gathering evidence that high-grade serous ovarian cancer (HGSOC) was a fallopian tube malignancy masquerading as an ovarian one, but the evidence was circumstantial. In 2011, a team led by Ronny Drapkin, MD, PhD, an anatomic research pathologist at Dana-Farber's Center for Molecular Oncology Pathology and co-director of the TRR, developed the means to study cells lining the fallopian tube (the fallopian epithelium) by culturing them in the laboratory. His team's work was based on molecular studies by Christopher Crum, MD, director of GYN Pathology at DF/BWCC, proving that at least some high-grade ovarian cancers do originate in the fallopian tube. Using tissue from women who had their fallopian tubes removed for reasons unrelated to cancer, the researchers also established a model that mirrors the structure and function of normal fallopian tube tissue in the body, enabling them to study how this tissue responds to physiological stressors that can trigger cancer development.

“We made a lab-based platform to study the cell of origin in fallopian tube tumors,” says Dr. Drapkin. “This was all dependent on living tissue [from human donors].” The findings allow clinicians and scientists to identify different types of HGSOC, and possibly discover biomarkers that signal the presence of the disease and test potential therapies.

In her lab, Dana-Farber breast cancer geneticist Kornelia Polyak, MD, PhD, uses human breast tissue samples to study groups of cells within tumors and monitor how they change and respond to treatment. This so-called tumor heterogeneity reveals that one tumor can have different subtypes of cells, with different genes and proteins and varying rates of growth. For this reason, treatments may need to be combined to destroy different cancer cell types.

Using sophisticated technology, Dr. Polyak compares tumor samples taken before and after treatment to determine how their genetic makeup (genotype) and physical characteristics (phenotype) have changed. Physical and genetic differences among cancer cells, she says, may influence how fast tumors spread or how quickly they become resistant to therapy.

“Animal and cell culture models are good for some research,” says Dr. Polyak. “But models may not faithfully reflect reality. We have to study human tissue and listen to what it tells us. Models show what can happen, but human tissue shows what really does happen.”

Dr. Polyak is also collaborating with Nancy Lin, MD, clinical director of the Breast Oncology Center, on a clinical trial that is heavily dependent on using tissue samples to answer key questions about treatment effectiveness.

The most successful drug treatments for breast cancer target estrogen receptors, progesterone receptors, or HER2 receptors on cancer cells. Unfortunately, many women have what is called triple-negative breast cancer, meaning that they lack all these receptors. This type of breast cancer is often driven into remission by standard chemotherapy, but patients whose triple-negative tumors do not go away after chemotherapy may have a poor prognosis.

Two recent clinical trials led by Judy Garber, MD, MPH (pictured above), tested the use of the chemotherapy drug cisplatin in patients with triple-negative breast cancer. Dr. Garber collaborated with molecular pathologist Andrea Richardson, MD; Daniel Silver, MD, PhD; Eric Winer, MD; and their teams. They analyzed tumor tissue collected before and after cisplatin treatment, and looked for features in cancer cells’ DNA that predicted a favorable response to the drug.

The analyses made it possible to predict which patients were most likely to respond to cisplatin treatment. “That way, we could give cisplatin to patients with the marker, who are more likely to respond to it,” says Dr. Garber. “For those without the marker, we would not waste time with cisplatin and instead try something else.”

Technology has given scientists the ability to discover many of the anomalies in cancer cells’ genetic programming and the capacity to target those glitches to stop the cancer or, at least, slow its progression. “Living” tissue is now an essential resource for scientists studying women’s cancers. It lies at the heart of such breakthroughs.

“Without tissue, cancer research would go much more slowly,” says Dr. Garber. “Now, we can sequence the entire genome of a tumor to find its Achilles’ heel. Much of the progress we’ve made is because we can study the patient and her tumor through tissue. That gives us an edge over other types of medical research.”
Survivor Spotlight

Expecting a Baby – Not Cancer

I
n the course of one whirlwind year, Allison Bellevue moved to the Boston area, started a new job, met her future husband, and discovered she was pregnant. Compared to what followed, that year was a breeze.

When Bellevue, now age 31, went for her first fetal ultrasound, doctors noticed a small mass on her right ovary. They told her not to worry: it was likely a cyst, and they would keep an eye on it over time.

A month later, the mass had grown enough to warrant removal. Three days after surgery, when Bellevue was 17 weeks pregnant, her obstetrician delivered some jolting news: Bellevue had ovarian cancer.

“I heard those words and I stopped listening,” recalls Bellevue. “I thought, this can’t be happening.”

Though she knew her health was in jeopardy, Bellevue was more concerned about her pregnancy and the baby. She and her partner Ruyter – who is now her husband – braced themselves for a wrenching course of treatment, and her mother moved from Pennsylvania to help them navigate the complicated months ahead.

Bellevue turned to Ursula Matulonis, MD, a medical oncologist in the gynecologic oncology program in the Susan E. Smith Center for Women’s Cancers at Dana-Farber/Brigham and Women’s Cancer Center (DF/BWCC). Though Bellevue’s situation was very rare, it wasn’t the first Dr. Matulonis had seen. She developed a specific treatment plan to address her patient’s early-stage, clear-cell ovarian cancer – an aggressive type for which chemotherapy would be required, but would be delayed until her second trimester.

“You hear the words ‘chemotherapy’ and ‘pregnancy,’ and wonder, ‘How in the world am I going to have a healthy baby?’” says Bellevue. But she was reassured by Dr. Matulonis’ approach and expertise. “She looked me right in the eye, started from the beginning, and explained it all. She answered my questions without my having to ask them.”

Bellevue began chemotherapy in her 23rd week of pregnancy. Throughout treatment, Dr. Matulonis stayed in constant contact with Bellevue’s high-risk obstetrician and her surgical team.

“We have an obligation to make sure that the patient and the baby are as healthy and safe as possible, and it’s very important to work as a team,” Dr. Matulonis explains, adding that nurses, social workers, and an OB/GYN surgeon were among those coordinating Bellevue’s care.

She had her final treatment in September 2011, and nearly a month later she gave birth to Lucas, a healthy, robust, seven-pound-plus baby boy. Dr. Matulonis came to her hospital room to meet him. “I started crying when she walked in,” Bellevue remembers.

Seven weeks after Lucas was born, Bellevue’s right ovary was removed at DF/BWCC. Today, she and her family, including her two young stepsons, enjoy life at home in Abington, Mass.

“Getting cancer was always something that happened to other people,” she reflects. “It seemed like it was someone else’s story. But it wasn’t. It was my story.”

For Allison Bellevue and her husband, Ruyter, son Lucas arrived despite ovarian cancer.
Megan McCormick insists that cancer is not going to rob her of opportunities to enjoy her life. “I feel great,” says McCormick, 49, a union journeyman carpenter who was diagnosed with stage 4 breast cancer in December 2011.

McCormick is determined to maintain a physically active, socially engaged lifestyle. Even on the coldest winter days, she doesn’t miss a chance to walk a mile and a half from her home in Boston’s Jamaica Plain neighborhood to her appointments at Dana-Farber/Brigham and Women’s Cancer Center (DF/BWCC) – except when she’s driving her sporty black convertible with the top down.

“I turn on the heat and warm the seats,” says McCormick. “I love convertibles.”

After her diagnosis in 2004, McCormick had surgery, chemotherapy, and radiation therapy, and continued on hormonal medications for five years. Two years later, her cancer came back.

McCormick consulted Eric Winer, MD, director of the Breast Oncology Program at the Susan F. Smith Center for Women’s Cancers. In January 2012, she began treatment at DF/BWCC. Seeing a “world-famous oncologist,” she says, helped put her turbulent mind at ease. An added bonus was the chance to reconnect with nurse practitioner Jennifer McKenna, RN, MSN, AOCNP, who had provided care eight years earlier, when McCormick was treated at another Boston hospital. (McKenna moved to DF/BWCC in 2008.)

“Jen is one of my three rocks,” McCormick says. “The other two are my wife, Carla, and my twin sister Maura, who moved from California to be near me.”

McCormick now visits DF/BWCC every four weeks for hormonal therapy to combat the metastatic, estrogen receptor-positive breast cancer that has spread to her bones. Her treatment includes Lupron, which induces menopause, and Letrozole, an aromatase inhibitor.

Between treatments, McCormick and her wife, Carla Osberg, travel, entertain friends, and enjoy athletic activities. “We like to have fun,” says McCormick. They often visit Osberg’s parents in California, and make frequent trips to Provincetown and other Cape Cod havens.

Although she reluctantly left her job as a home energy auditor – the physical demands were too intense – she now relishes the chance to offer home improvement advice to friends and family members. She plans to start training for the Pan-Massachusetts Challenge, an annual bicycling fundraiser that supports cancer research and treatment at Dana-Farber. She and Osberg, who participated in the ride last August while McCormick cheered her on, have deemed themselves Team McOzzie.

“I’m committed to at least 50 miles,” McCormick says. McKenna predicts McCormick will do well next summer and for years to come, given her response to the treatment and her seven-year, disease-free interval.

“Meg is someone who has a really positive outlook on life,” says McKenna. “She will make the most of the time she has, which we hope will be many years. It’s a pleasure to take care of her.”

Like most cancer patients, McCormick has moments of apprehension but is characteristically eager to embrace the chance for a quick laugh or a new adventure.

“If you’re always down in the dumps, always woe-is-me, it’s not going to help you,” she says. “There’s only so much you can do. You have to have a good attitude.”

Meg McCormick (left) stands with her “rock,” Jennifer McKenna, RN, MSN, AOCNP.
A Woman’s Background Can Influence Her Cancer Experience

A Conversation with Rachel Freedman, MD, MPH

During her oncology training, Rachel Freedman, MD, MPH, wanted to understand why patients with lower incomes, less education, language limitations, advanced age, or other vulnerabilities may not receive optimal care for their cancer. Now a clinical investigator and clinician in the Breast Oncology Program at the Susan F. Smith Center, Dr. Freedman studies disparities in breast cancer incidence, treatment, and outcomes. She shares her thoughts about why patient perspectives matter, and how addressing often-overlooked barriers can lead to better outcomes.

How can the outcome of breast cancer treatment be affected by demographic and socio-economic factors?

Through my own research and the work of others, I have observed that cancer care disparities exist by age, race or ethnicity, socio-economic status, access, and insurance coverage. Disparities exist not only in the time it takes for the cancer to be noticed and diagnosed, but also in the stage of the cancer, the delivery of care, and the outcome.

Why the differences?

It’s very complicated. There are patient, provider, and disease factors that may contribute to differences in receipt of care and/or outcomes after a cancer diagnosis. Patients may have varying preferences for treatment, coexisting medical decisions that limit their ability to receive treatments, stress in their lives, jobs they can’t lose, variable access to care, and mistrust of the medical system.

Disease-related factors also contribute to disparities. For example, younger black women have higher rates of triple-negative, higher-grade cancers, which are associated with higher rates of recurrence. Providers and hospitals can also contribute to disparities because of variable practice patterns, knowledge, and geographic differences in care.

How has your research influenced your own clinical approach?

My research has taught me that many patients are at risk for not receiving recommended cancer care even when we do our best to provide a care plan. We have to ask our patients what their challenges are, including emotional, financial, and medical. If a patient is in need, Dana-Farber has many resources that can make a difference.

Disparities research is a relatively new focus. What are the current challenges?

Over the last decade, more attention has been paid to disparities, and nation-wide efforts are underway to eliminate them. However, at this point, we know disparities are there, but still do not know how we are going to fix the problem. Funding is another challenge. It’s difficult for investigators to get financial support for this type of research.

How do we achieve better outcomes for all breast cancer patients?

We need to do everything we can to provide evidence-based, optimized and personalized treatments to every single patient who walks in the door.
Making a Difference

A Legacy of Support
Thanks to the ongoing generosity of its donors, Dana-Farber’s Susan F. Smith Center for Women's Cancers has raised more than $107 million over the past 14 years, and more than $9 million in fiscal year 2012 alone.

To learn more about how you can strengthen our ongoing work against women’s cancers, contact Katherine Raute at 617-632-6550 or katherine_raute@dfci.harvard.edu.

The American Cancer Society estimates that in 2012 more than a quarter million women were diagnosed with breast or gynecological cancers; more than 69,000 lost their lives to these diseases. Thanks to the vision and generosity of our donors, Dana-Farber continues to offer patients the best in care while pursuing research that will lead to more effective and less toxic treatments. Our scientists continue to make progress on many fronts in their ongoing battle against these complex diseases. There are many ways in which patients, families, and friends can contribute as well.

Other Ways to Help
When you donate blood or platelets at the Kraft Family Blood Donor Center at Dana-Farber Cancer Institute and Brigham and Women’s Hospital or on the new Dana-Farber/Brigham and Women’s Hospital Blood Mobile, you make a life-saving difference for patients at both hospitals. To schedule an appointment or learn more, call 888-538-7448 or email blooddonor@partners.org.

To learn more about becoming a potential bone marrow/stem cell donor, visit www.dana-farber.org/nmdp or contact Dana-Farber's National Marrow Donor Program office at 866-875-3324 or nmpdonor@dfci.harvard.edu.

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To make a gift from your smartphone, scan this QR code.
Or visit www.dana-farber.org/gift.
You’ll be directed to our “Make A Gift” donation page.
To honor them for being the “rocks” in her life during treatment, breast cancer patient Meg McCormick (far right) gave rocks to (from left to right) her Dana-Farber nurse practitioner Jennifer McKenna, RN, MSN, AOCNP; her sister, Maura McCormick; and her wife, Carla Osberg.