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Long before President Richard M. Nixon declared war on cancer in 1971, Americans dreamed of a day when the disease, in its hundreds of forms, would be conquered. Over 35 years have passed since that declaration of war, and Americans – and all other global citizens – are still dreaming and asking: Are we even close to winning the war on cancer?

We asked past and present Roswell Park CEOs – Drs. Thomas B. Tomasi (1986-1996), David C. Hohn (1997-2006) and Donald “Skip” Trump (Current) – to share their views on this question and the future of cancer care and research.

Are you optimistic about eradicating cancer in our lifetime?

Trump: If not my lifetime, then my children’s.
We are making progress. The American Cancer Society recently reported that cancer death rates in the United States have declined for the second consecutive year – a remarkable achievement. What is even more notable is that it was done at a time when the population is growing larger and people are living longer.

Hohn: These survival rates are a reason for optimism and clearly indicate that considerable gains are being made. People are making healthier choices. The smoking rates are down and individuals are following their doctors’ recommendations for screening which helps to find cancers early when they are most treatable.

Tomasi: New targeted therapies are another reason for this significant decline in cancer death rates. These treatments are the direct result of the investment made in research focusing on understanding how cancer develops at the molecular level. The impact of these laboratory discoveries is beginning to be felt in the clinics where they are benefiting cancer patients.

What challenges lie ahead?

Tomasi: If cancer care continues to be measured by dollar signs – and not vital signs – then patients now and in the future will pay the price. While the death rates are declining, so is federal funding for cancer research. Cancer costs this country about $210 billion a year in direct medical costs, lost wages and productivity. Aggressive federal support of cancer research will
pay future dividends in terms of earlier diagnosis, improved treatments and saving lives.

**Trump:** We have made so much progress in the last few decades that it is easy to take the pace of improvement we have seen in cancer treatment for granted – but we shouldn’t. Scientific advances are being turned into practical, safe and effective treatments through clinical studies. Yet, an estimated 95 clinical studies are at risk due to current funding cuts. Only through clinical trials can scientists and clinicians determine if a new treatment works better than the current standard of care. Through continued and expanded clinical trials, the cancer care community has an enormous potential to improve survival rates and save lives.

**Hohn:** In addition to concerns about research, I also have concerns about looming workforce shortages that will negatively impact access to care and ongoing research programs. Personnel shortages throughout the cancer research and treatment system include nursing, radiation therapists, medical oncologists, some surgery specialists, diagnostic radiologists and perhaps most critically, clinician-scientists who translate discoveries into new therapies and then put these treatments to work for patients. A comprehensive strategic plan to strengthen the cancer workforce is needed immediately to deal with the workforce shortages that will emerge in the coming years.

**Where will the most promising advances in cancer research and treatment come from and how will we ensure those treatments are widely available?**

**Tomasi:** I’m a scientist so of course I see science as being key to eradicating cancer. Cancer treatment is evolving at light speed because of the expanding scientific knowledge about cells and how they grow and divide. This has resulted in the ongoing development of highly specific drugs that target individual cancer cells. These so-called “smart missiles” hone in on particular cancer-causing molecules and kill only those cells. Another promising area of research is the regulation of genes by micro RNAs. These amazing “gifts” have been shown to regulate immune and cancer genes, which could lead to entirely new types of therapies tailored to specific cancers, with less toxicity and fewer side effects.

**Hohn:** Perhaps the best way to assure that state-of-the-art care is broadly available is through comprehensive care guideline initiatives, developed and maintained by the National Comprehensive Cancer Network, of which Roswell is a charter member. Over 100 treatment guidelines – for essentially every kind of cancer and treatment side-effect – are continually updated by teams of experts. These guidelines reflect the latest research results and are being widely used to guide treatment and reimbursement on a worldwide basis.

**Trump:** I believe we will make substantial progress in the next 10 years as we develop new ways to diagnose and treat cancer. For example, Roswell Park researchers, in collaboration with 11 centers in the United States and Europe, are now able to collect and analyze precancerous lung conditions before they become cancer. All this information is gathered in one database, organized and then made accessible to scientists at partner institutions. A wide range of studies is expected to shed light on the progress and development of one of the most deadly forms of cancer.
As a cancer surgeon at Harlem Hospital in New York City, Harold Freeman, MD, discovered that half the women who were seen there for breast and cervical cancer could not be cured because their cancers were discovered too late. In most cases, a tangle of financial, educational and social disadvantages kept them from getting the screening and care they needed.

Their plight led Freeman to develop a “navigation” program for patients at risk of falling through the cracks in the healthcare system. Inspired by that example, Roswell Park launched a similar program in May 2007 to assist at-risk patients with breast cancer. It was spearheaded by Roswell Park breast physicians Stephen Edge, MD, Swati Kulkarni, MD, and Tracey O’Connor, MD, out of concern for patients who abruptly stopped coming for treatment.

Navigators Mildred Kelly and Dee Johnson currently assist 25 women in the program, most with “the same major problem—they can’t afford to stay in treatment once they begin,” says Johnson. Kelly clarifies that it’s not the cost of the treatment itself that stands in their way: “If they don’t have medical coverage, Medicare or Medicaid or some state fund will kick in to pay; that’s not such a big issue. But nine times out of ten, their employers don’t provide paid medical leave, so they can’t miss even one day of work, or they won’t get paid. They say, ‘What am I going to do? I have to feed my family.’”

When members of the Roswell Park medical team alert Kelly and Johnson that a patient is “missing in action,” or may require special help, the navigators contact her to evaluate her needs, explains Deborah Erwin, PhD, Director of Health Disparities. The patient may not know about the range of services available to her; if she can’t read, she may need verbal reminders about appointments, or simplified explanations of instructions provided by her doctor; or she may need to have appointments grouped closely together to minimize the time she has to take off from work.

Because some patients find it hard to communicate with medical professionals, Erwin adds, navigators...
Tamoxifen Delivers Long-Term Protection

Some women at risk for breast cancer take tamoxifen to prevent the disease from developing or recurring. Now there’s evidence that the drug continues to protect them long after they stop taking it. Two recent studies in Great Britain compared the long-term outcomes of breast cancer patients who took tamoxifen with those who did not. The studies, which together enrolled nearly 10,000 participants, showed a 34-39% decrease in the risk of developing estrogen receptor (ER)-positive breast cancer over a period of 8-13 years.

An even greater risk reduction – 43% – was documented in the Breast Cancer Prevention Trial (BCPT), an earlier study of 13,000 women in the U.S. The difference seen in the BCPT results may be due to the fact that the U.S. trial did not allow participants to undergo hormone replacement therapy (HRT) during the study, because HRT can reduce the effectiveness of tamoxifen. Both trials in Great Britain included women on HRT. The Study of Tamoxifen and Raloxifene (STAR), another study with 19,000 women in North America, showed that raloxifene, a drug similar to tamoxifen, has equivalent benefit of reduction in breast cancer risk with slightly fewer of the rare, but serious, side effects.

The Great Britain studies also showed that the risk of serious side effects associated with tamoxifen, including blood clots and endometrial cancer, declined quickly after the drug was discontinued. The discovery that tamoxifen prevents breast cancer grew out of extensive experience with its use in women with breast cancer. New drugs, called “aromatase inhibitors,” have recently been found to work a bit better in post-menopausal women with breast cancer, and also to provide protection in those women. Large studies are now underway, including in Western New York, to determine if this new class of drugs is safe and effective for preventing breast cancer in women who have not had the disease.

For more information, Dr. Edge can be reached by email at Stephen.Edge@roswellpark.org.
Medical oncologists have long been challenged by problems associated with the toxicity of chemotherapeutic drugs. The dosage must be sufficient to kill the cancer cells, but limited in order to reduce side effects and unintended damage to normal cells.

The development of photodynamic therapy (PDT) at Roswell Park Cancer Institute (RPCI) more than 30 years ago made it possible to sidestep that fine line. Now approved by the U.S. Food and Drug Administration for specific applications, PDT uses non-thermal red light to activate systemically administered Photofrin®, or protoporphyrin IX produced from topically administered 5-amino-levulenic acid (ALA). Reactive oxygen species produced by the light-sensitive drugs is toxic to the cancerous cells in which it concentrates. The main side effect of treatment with Photofrin® is sensitivity to light, which requires the patient to avoid bright sunlight and other strong sources of light for four to six weeks after treatment. With topical ALA, however, this skin photosensitivity is minimal. PDT is performed on an outpatient basis and can be repeated as necessary; it may be an option for patients with complicating conditions that would make them ineligible for surgery, or even as an adjuvant that reduces the scope and complexity of subsequent surgery.

A world leader in the refinement of PDT, RPCI offers the treatment for patients who have:

- Certain early- and late-stage lung tumors—which must be located in an airway and accessible with a bronchoscope—and some malignancies of the pleural space.
- Skin cancers, particularly basal cell carcinoma including nevoid basal cell carcinoma syndrome (NBCCS), *in situ* squamous cell carcinoma (Bowen’s disease), and premalignant actinic keratoses. RPCI has treated almost 10,000 skin cancers with PDT.
- Gynecologic tumors that are easily accessible to the light source used for treatment—especially those of the vagina, vulva and cervix. PDT has produced long lasting results for recurrent tumors.
- High-grade dysplasia associated with Barrett’s esophagus, and early-stage esophageal cancer. PDT can be a welcome alternative to esophagectomy, which is associated with a mortality rate as high as 25% and significant post-surgical quality-of-life issues. PDT is also FDA-approved for palliative treatment of patients with advanced esophageal cancer, to clear total or partial obstruction.

For many patients, PDT provides a less-toxic treatment option that hits the cancer target with fewer collateral effects. Ongoing research at RPCI is focused on producing more effective topical and systemic photosensitizers as well as lasers capable of reaching deeper tumors—goals that promise to expand the potential applications of PDT.

For more information about PDT at Roswell Park Cancer Institute, visit www.roswellpark.org/pdt. For information about open clinical trials involving PDT, please visit www.roswellpark.org/clinicaltrials and search by disease site.
Until recently, patients with relapsed or refractory chronic lymphocytic leukemia (CLL) had very few treatment options available to them. Lenalidomide (Celgene’s Revlimid®), approved by the U.S. Food and Drug Administration in 2006 for the treatment of multiple myeloma, is now showing exceptional promise against CLL, the most common hematologic malignancy in the Western Hemisphere.

In a Phase II clinical trial conducted at Roswell Park Cancer Institute (RPCI), lenalidomide triggered a response in the majority of the 45 participating patients, who came to RPCI from across the U.S. and Canada. In some cases, patients experienced a sharp decline in leukemic cell counts, from 300,000 to 30,000, in a matter of days. All had previously undergone chemotherapy, with an average of three rounds.

The immunotherapy appears to target the tumor environment, making it inhospitable to cancer cells. Initially the treatment induces inflammation in the lymph nodes as a result of the immune response, but this subsides 10 to 14 days after treatment begins. Along with extraordinary efficacy, lenalidomide has the distinct advantage of convenience and better quality of life for patients, who take one pill per day, with minimal side effects. During the Phase II trial, participants flew to Buffalo for an hour-long evaluation of response and side effects and then returned home for continued monitoring by their personal physicians.

Because lenalidomide is a derivative of thalidomide, Celgene has instituted a mandatory education program for patients and prescribing physicians, to prevent its use by women who are pregnant or who might become pregnant, thus safeguarding against the possibility of endangering fetal development.

A larger international study, involving 30 cancer centers and 240 patients, will be conducted to confirm and expand on the results of the Phase II trial. An additional study at RPCI will evaluate the use of lenalidomide as an initial therapy for patients with early-stage CLL, whose immune systems have not been compromised by other treatments.

Further research may demonstrate that lenalidomide is a viable alternative to chemotherapy for some CLL patients, and may lead to new applications for the drug against other kinds of cancers. At the same time, the clinical trials conducted at RPCI have generated interest in developing an entirely new class of therapeutic agents for the treatment of CLL.

For more information about the use of lenalidomide at Roswell Park Cancer Institute for the treatment of CLL or multiple myeloma, please contact me via email at Asher.Chanan-Khan@roswellpark.org.