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Director's Update

The Science of Survivorship from a Personal Perspective

NCI is dedicated to science at the highest level: research that leads to effective interventions with reduced toxicity; diagnosis at earlier, more treatable stages; and prevention strategies based on a molecular understanding of carcinogenesis and targeted interventions. But our mission to reduce the burden of cancer doesn't end there. A vital component of NCI's research focuses on America's growing population of cancer survivors, who now number more than 10 million, up from only 3 million in 1971.

For a great many patients, cancer's effects continue long after treatment is completed. Consequently, NCI's survivorship science, under the leadership of the Office of Cancer Survivorship (OCS), seeks to understand, for example, why two patients with strikingly similar tumors may face starkly different possibilities of future disease recurrence. We also track and study the experiences of former patients in order to obtain deeper knowledge about the posttreatment effects of cancer drugs and devices. And we seek

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OCS Hosts Cancer Survivorship Research Conference

At this year's biennial cancer survivorship research conference, "Cancer Survivorship: Embracing the Future," held October 4–6 at the Bethesda Marriott Hotel in Bethesda, Md., more than 400 people gathered to discuss the state of the science for cancer survivorship.

"Survivors often find their ordeal transformed into an experience of growth and self-realization," explained Ellen Stovall, president and CEO of the National Coalition for Cancer Survivorship, during her opening address. "They can try to help others by leaving them hints as to how to survive."



Conference leaders honored Ellen Stovall (center) for helping establish OCS, and Dr. Anna T. Meadows (not pictured) as the founding director of OCS.

"We came here to discuss the framework of the research enterprise," said Dr. Julia Rowland, director of OCS. "We now have an evidence base gathered by multidisciplinary teams to show the challenges our growing population of survivors face. Things that survivors have been telling us for a while—that

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PEGGY SANDERS

1-year survivor

KATHY HIGINBOTHAM

9-year survivor

DR. KEITH BELLIZZI

11-year survivor

DR. NANCY BREEN

5-year survivor

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answers about how patients can better cope with the emotional and financial pressures that may result from successful treatment.

This special issue of the *NCI Cancer Bulletin* on cancer survivorship marks the 10th anniversary of OCS, a founding that owes a great debt to a landmark report developed under the leadership of the National Coalition for Cancer Survivorship. That 1996 paper, *Imperatives for Quality Cancer Care: Access, Advocacy, Action & Accountability*, called for research on a range of issues, including quality of life and outcomes; the impact and burden of cancer care on caregivers; case management; the effects of cancer on childbearing; and differences in survivorship based on culture and ethnicity.

In its first decade, OCS has blossomed from a fledgling program to a source of solid science that today administers more than 125 research grants and conducts important symposia for the cancer community, such as its recent 3-day conference, "Cancer Survivorship: Embracing the Future," cosponsored by the American Cancer Society (ACS) and the Lance Armstrong Foundation.

Events like this conference remind us that cancer alters not just the lives of patients, but of parents, children, friends, loved ones, and caregivers, all of whom are included in NCI's definition of "survivor." Indeed, for many of our colleagues at NCI, cancer is a personal—as well as a professional—issue, because they are themselves survivors. In honor of loved ones, in tribute to former patients, or in testament to their own cancer battles, a number of NCI staff members have volunteered

the photographs you see at the top of this page and the pages that follow. Together we mark a first decade of NCI's OCS, and we look forward to every scientific discovery and new kernel of knowledge OCS will produce in the years ahead. ♦

*Dr. John E. Niederhuber
Director, National Cancer Institute*

(Conference continued from page 1)

they feel chronically tired, or that they have memory troubles—are now appreciated as very real cancer-related phenomena. Survivorship research increasingly is moving beyond pure description of cancer's impact to include efforts to develop and test interventions to prevent or ameliorate its adverse effects."

During a conference pre-session, senior researchers were paired with cancer survivors who work in advocacy so that they could develop mentoring relationships after the conference, helping survivors to understand—and ultimately help communicate to their constituents—complex issues such as clinical trial designs, study results, and research funding. Following this, plenary sessions included communications and e-health, posttreatment follow-up care, survivorship among underserved populations, and the impact of cancer on family caregivers.

Dr. David Gustafson, director of the Center of Excellence in Cancer Communication Research at the University of Wisconsin-Madison, described his group's NCI-funded effort to enhance cancer communications with Internet technology through the Comprehensive Health Enhancement Support System. NCI's Dr. Neeraj Arora cited data from sev-

eral recent studies that are being used by his group in the Division of Cancer Control and Population Sciences (DCCPS) to design electronic information formats for specific audiences, addressing their related health-information disparities.

A dozen breakout sessions allowed conference attendees to meet in smaller groups. During poster sessions, researchers presented preliminary data from their ongoing or as-yet-unpublished studies. Poster topics included the prevention of lymphedema after breast cancer with tailored exercise; the prevalence of joint symptoms in postmenopausal women who take aromatase inhibitors for early-stage breast cancer; the meaning of cancer survivorship for Hispanic adolescents; fertility and pregnancy after cancer; and adherence to preventive swallowing and dental regimens after head and neck cancer, among others.

While most people attended the conference for professional reasons, many also came as representatives of the phenomenon that originally inspired this event—the fact that they have lived through cancer. Among them was Carl Rogers, a 63-year-old writer and communications consultant who does advocacy work on behalf of The Wellness Community in Los Angeles. He has survived three primary cancers—kidney, colon, and prostate. "The struggle is quite a gift, actually," he said. "You are given an opportunity to fight for wellness, and the payoff is often more than a medical recovery. I've never been so alive. The skill of carefully selected physicians, married to the will of an informed patient, can produce some pretty amazing stuff." ♦



DR. DEBBIE WINN
13-year survivor

SAMANTHA COGAR FARRELL
9-year survivor

DR. NEERAJ ARORA
12-year survivor

JOAN BECKER
16-year survivor

Survivorship Spectrum

Childhood Cancer Survivors Research

The Childhood Cancer Survivor Study (CCSS) is an NCI-funded research project that includes a cohort of more than 20,000 people who were diagnosed with cancer as children between 1970 and 1986, and who survived at least 5 years. Because of the study design and the large number of people enrolled, CCSS has allowed researchers to discern long-term disease- and treatment-related outcomes with unprecedented clarity.

“As more children become survivors and live for decades, we have more opportunities to learn about the long-term effects of cancer and its treatments,” says Dr. Barry Anderson, senior investigator in NCI’s Cancer Therapy Evaluation Program and scientific liaison to the study.

CCSS operates through a network of 26 pediatric oncology research centers and has enrolled survivors with a spectrum of cancer diagnoses and treatments, characterizing their specific treatment parameters and updating this information with self-reports, tissue specimens, and follow-up questionnaires every 2 years that detail their health and psychosocial status. More than 4,000 siblings are also included as controls.

“The data we gather is a scientific resource, not only for members of CCSS, but for any investigator in the research community,” says Dr. Les Robison, chair of the Department of Epidemiology and Cancer Control at St. Jude Children’s Research Hospital

in Memphis. More than 60 studies have been published to date, including many that were used to develop the current long-term follow-up guidelines from the Children’s Oncology Group.

Clinical researchers are often faced with designing treatments that balance cure rates and side effects, both immediate and long term. Another challenge is to develop effective interventions for survivors after treatment, such as teaching preventive behaviors or recommending heightened screening. The research published by CCSS helps physicians to sort through these issues and to guide evidence-based practice.

For example, a major CCSS study on chronic illness appeared in the October 12 *New England Journal of Medicine*, showing that childhood cancer survivors are eight times more likely to develop a severe or life-

threatening chronic health condition. “The impact of some of these health problems can be reduced with periodic survivor-focused follow-up,” said Dr. Kevin Oeffinger, lead author of the study and a researcher at Memorial Sloan-Kettering Cancer Center in New York City.

Plans are under way to recruit another 14,500 cancer survivors to CCSS, particularly from among minority populations. These people, who were diagnosed between 1987 and 1999, will reveal the long-term effects of cancer therapies including agents like ifosfamide, dose-intensive treatment regimens, and the reduction in radiotherapy for Hodgkin disease and childhood acute lymphoblastic leukemia.

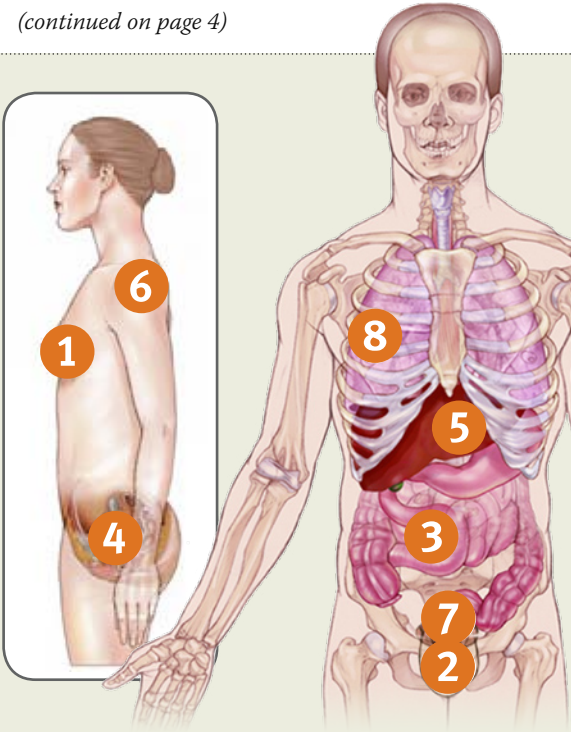
Promoting Health and Well-Being after Cancer

Many cancer survivors attempt to make lifestyle changes such as exercising, quitting smoking, and

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CANCER SURVIVORS AS OF 2003, BY CANCER SITE
(N=10.5 MILLION)

- 1 Female Breast 23%
- 2 Prostate 19%
- 3 Colorectal 10%
- 4 Gynecologic 10%
- 5 Hematologic 7%
(HD, NHL, Leukemia)
- 6 Melanoma 6%
- 7 Other GI 6%
(Bladder & Testes)
- 8 Lung 3%
- 9 Other 17%





BROOKE HAMILTON
13-year survivor



DAVE NATELLA
2-year survivor



KARA SMIGEL-CROKER
1-year survivor



PATRICIA DAVIS
20-year survivor

(Spectrum continued from page 5)

“The important message here is that cancer is often a life-altering and potentially traumatic event,” explains Dr. Julia Rowland, director of NCI’s OCS, “but we can make recovery easier by educating survivors on what to expect, giving them ways to manage stress, teaching them effective behavioral and coping skills, and directing them to resources that can help them not merely survive, but hopefully thrive after treatment.”

Caregivers of Cancer Patients Are Also Survivors

There is mounting research cataloging the impact that caring for loved ones with cancer—by parents, spouses, siblings, even close friends—can have. It might come as no surprise, for example, that parents of children who have undergone cancer treatment can show psychological problems similar to those seen in people who have survived natural disasters or war. Moreover, studies have revealed that such posttraumatic stress symptoms can be, and often are, worse than those seen in the child, and that they can last for months and even years after treatment is over.

Although it’s a relatively new area, explained OCS Director Dr. Julia Rowland, research on cancer caregivers has matured to the point where it is now testing interventions to help individuals, and often families, deal with the physical, psychological, and financial effects of providing care.

The studies are attempting to “test interventions that promote communication between survivors and

their caregivers, and enable caregivers to feel competent in or informed about the care that they deliver,” Dr. Rowland said. “Others are attempting to enhance caregivers’ coping skills and attention to personal health and well-being.”

At The Children’s Hospital of Philadelphia, for instance, Dr. Anne Kazak, who directs its Center for Pediatric Traumatic Stress, is testing a family-based program to help both children and parents better handle the psychological trauma that cancer can inflict on families.

“The program model integrates cognitive behavior therapy and family therapy,” Dr. Kazak explained. “It asks family members, within the context of a group of families, to discuss their beliefs about what’s happened to them, and then uses behavioral approaches to help them cope better and feel better.”

Among Dr. Laurel Northouse’s caregiver-related projects at the University of Michigan in Ann Arbor is a similar family-based intervention for survivors and caregivers that strictly involves single-family encounters. The program has been used successfully to help women with recurrent breast cancer and their caregivers cope with emotional challenges, and Dr. Northouse and her colleagues just completed a study using it to help men who have been treated for prostate cancer and their spouses.

Among Survivors, Cancer Sometimes Returns

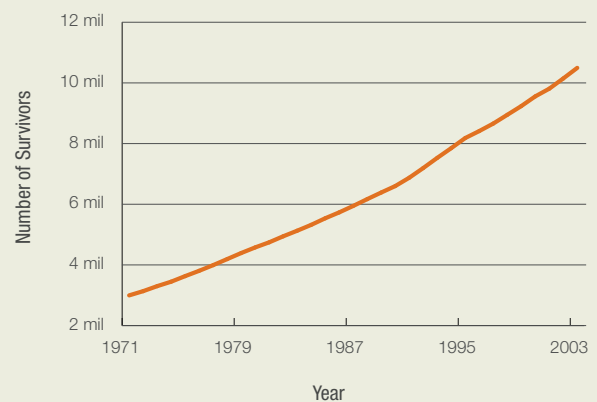
With recent advances in the treatment and early detection of cancer, there is a growing need to monitor the risk of developing new malignancies among long-term survivors of cancer.

“We know that the burden of second cancers is not borne equally among cancer survivors,” says Dr. Joseph F. Fraumeni, Jr., director of NCI’s Division of Cancer Epidemiology and Genetics (DCEG). “But there are patterns of incidence that make it possible to tailor prevention strategies, including long-term surveillance for early diagnosis and treatment of subsequent tumors.”

Among research elucidating these patterns of new malignancies is that of Drs. Lois Travis and Mitchell Gail of DCEG, who developed a model for estimating a woman’s risk of developing breast cancer after treatment with large-field chest radiotherapy for Hodgkin lymphoma, showing that

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Increase in Cancer Survivors over Time
*2005 SEER SUBMISSIONS





A Conversation with...Dr. Julia Rowland



*Dr. Julia Rowland
Director,
NCI Office
of Cancer
Survivorship*

How does survivorship research fit into the cancer control continuum?

Up until 20 years ago, the medical community defined as cancer survivors only those individuals who remained disease free for at least 5 years after treatment—survivorship wasn't even on the radar screen. But today, clinicians and researchers recognize that life after cancer brings its

own unique challenges. Perhaps even more critically, many are also beginning to realize that the continuum of cancer care and control, while often portrayed as a straight line (from prevention to detection, treatment, survivorship, and end of life), is for most survivors, a cyclical process.

What are some of the disparities among cancer survivors?

As survivorship research expands, we are quickly learning that cultural and sociodemographic factors can differentially affect not just who survives cancer, but importantly, what their survivorship experience is like. For example, research suggests that

African American survivors of childhood acute lymphoblastic leukemia are at higher risk of early cardiotoxicity; Latina breast cancer survivors may suffer more physical symptoms from their illness than Caucasian, Asian, or African American women; rural cancer survivors worry more about the financial impact and isolation associated with their illness than their urban counterparts; and poverty is associated with high risk for psychosocial morbidity regardless of gender, age, culture, or geography. Among the biggest challenges we have for the future is to better understand the causes and consequences of these disparities, and find ways to eliminate them. ♦

(Spectrum continued from page 6)

cumulative risk increases with age at end of follow-up, time since diagnosis, and radiation dose.

Similarly, women who are treated for breast cancer with higher dose chemotherapy have been shown to be at increased risk for developing leukemia, and comprehensive postmastectomy radiotherapy has been linked to excess lung cancers, according to research by the NCI-funded [National Surgical Adjuvant Breast and Bowel Project](#). Researchers are now focusing on ways to identify which patients are most likely to benefit from chemotherapy or radiation, to avoid exposing women unnecessarily to these risks.

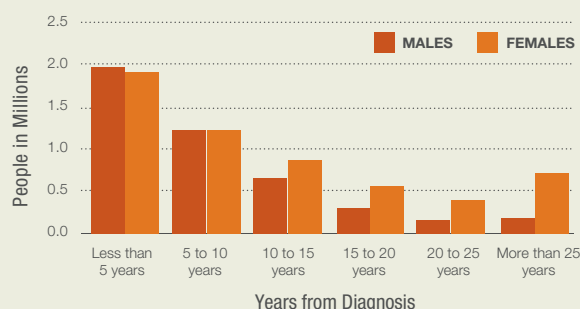
While certain therapies, environmental exposures, and genetics can predispose people to developing cancer again, it's important to note

that many second or multiple cancers in the adult survivor population are simply due to aging, says Dr. Julia Rowland, director of NCI's OCS. The most recent data from the Surveillance, Epidemiology, and End Results (SEER) program (2003) indicate that 16 percent of new diagnoses were among people who had already been treated for cancer, underscoring the importance of long-term surveillance and follow-up care among cancer survivors.

A monograph on the risks of second cancers—reporting on those that have arisen among U.S. cancer survivors from 1973 to 2000—

will soon be available as an NIH publication and on the SEER Web site. More than 50 adult and 18 childhood tumors, including new data on some uncommon sites and individual histologic types, are included with comparison between SEER data and other studies, and discussion of potential risk factors and mechanisms. ♦

Estimated Number of Persons Alive in the U.S. Diagnosed with Cancer on January 1, 2003 by Time from Diagnosis and Gender
(INVASIVE/FIRST PRIMARY CASES ONLY, N = 10.5 M SURVIVORS)



Survivorship Resources

National Organizations

NCI Office of Cancer Survivorship 301-402-2964	http://dccps.nci.nih.gov/ocs/
NCI Cancer Information Service 800-4-CANCER	http://cis.nci.nih.gov/index.html
National Coalition for Cancer Survivorship 877-622-7937	http://www.canceradvocacy.org/
American Cancer Society 800-ACS-2345	http://www.cancer.org/docroot/home/index.asp
CancerCare 800-813-HOPE	http://www.cancercare.org
Oncology Nursing Society 866-257-4667	http://cancersymptoms.org
Lance Armstrong Foundation 866-235-7205	http://www.livestrong.org
Many others listed at: http://www.cancer.gov/cancertopics/factsheet/support/organizations/	

Reports

<i>Summary of Cancer Prevalence and Survivorship Issues: Analyses of the 1992 National Health Interview Survey (JNCI, 1999)</i>	http://dccps.nci.nih.gov/ocs/1992.html
<i>Ensuring Quality Cancer Care, 1999 (IOM, 1999)</i>	http://dccps.nci.nih.gov/ocs/ensure.html
<i>Improving Palliative Care for Cancer (IOM, 2001)</i>	http://www.nap.edu/catalog/10149.html
<i>NIH State-of-the-Science Conference on Symptom Management in Cancer: Pain, Depression, and Fatigue (NIH, 2002)</i>	http://consensus.nih.gov/2002/
<i>Childhood Cancer Survivorship: Improving Care and Quality of Life (IOM, 2003)</i>	http://iom.edu/?id=31511
<i>A National Action Plan for Cancer Survivorship: Advancing Public Health Strategies (CDC and LAF, 2004)</i>	http://consensus.nih.gov/ta/022/022_intro.htm
<i>From Cancer Patient to Cancer Survivor: Lost in Transition (IOM, 2005)</i>	http://www.iom.edu/?ID=30869
<i>Living Beyond Cancer: Finding a New Balance (PCP, 2004)</i>	http://deainfo.nci.nih.gov/advisory/pcp/pcp03-04rpt/Survivorship.pdf
<i>Assessing Progress, Advancing Change (PCP, 2006)</i>	http://deainfo.nci.nih.gov/ADVISORY/pcp/pcp06rpt/pcp06rpt.pdf
<i>Cancer Epidemiology in Older Adolescents and Young Adults 15 to 29 Years of Age (SEER Monograph, 2006)</i>	http://seer.cancer.gov/publications/aya/

Cancer Follow-Up Care Guidelines

Follow-Up Care: Questions and Answers	http://www.cancer.gov/cancertopics/factsheet/Therapy/followup
American Society of Clinical Oncology (ASCO)	http://www.asco.org/
Children's Oncology Group Childhood Cancer Survivor Long-Term Follow-Up Guidelines	http://www.childrensoncologygroup.org/disc/LE/default.htm
M. D. Anderson Comprehensive Cancer Center	http://www.mdanderson.org/departments/lacc/dIndex.cfm?pn=7049AA7E-FC5A-11D4-810400508B603A14
National Comprehensive Cancer Networks (NCCN)	http://www.nccn.org/

NCI Fact Sheets and Tips

Facing Forward Series	http://www.cancer.gov/cancertopics/life-after-treatment
En Español: Siga adelante: la vida después del tratamiento del cáncer	http://cancer.gov/espanol/vida-despues-del-tratamiento
Coping with Cancer	http://www.cancer.gov/cancertopics/coping/

Clinic and Long-Term Care Referrals

Association of Cancer Online Resources (ACOR)/Pediatric Oncology Resource Center	http://www.acor.org/ped-onc/treatment/surclinics.html
Lance Armstrong Foundation LIVESTRONG Survivorship Center of Excellence Network	http://www.livestrong.org/site/c.jvKZLbMRIsG/b.739087/k.2142/Survivorship_Centers.htm
National Coalition for Cancer Survivorship	http://www.canceradvocacy.org/resources/guide/resources.aspx?sID=60

The *NCI Cancer Bulletin* is produced by the National Cancer Institute (NCI). NCI, which was established in 1937, leads the national effort to eliminate the suffering and death due to cancer. Through basic, clinical, and population-based biomedical research and training, NCI conducts and supports research that will lead to a future in which we can identify the environmental and genetic causes of cancer, prevent cancer before it starts, identify cancers that do develop at the earliest stage, eliminate cancers through innovative treatment interventions, and biologically control those cancers that we cannot eliminate so they become manageable, chronic diseases.

For more information on cancer, call 1-800-4-CANCER or visit <http://www.cancer.gov>.

Contact the *NCI Cancer Bulletin* staff at ncicancerbulletin@mail.nih.gov.