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Eliminating the Suffering and Death Due to Cancer

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Radiation Therapy for Early-Stage Breast Cancer Reduces Mortality

A new meta-analysis by the Early Breast Cancer Trialists' Collaborative Group (EBCTCG) has shown that radiation therapy after surgery for early breast cancer does much more than prevent local recurrence—it significantly improves 15-year survival.

In women with early-stage breast cancer treated with surgery alone, microscopic residual disease may not be eliminated and can eventually cause life-threatening metastatic recurrence. Radiation therapy has been widely recommended for local control after breast-conserving surgery (BCS) and after a complete mastectomy in women at high risk of recurrence. However, even with widespread support for these recommendations within the medical community, they are not always heeded.

Because local recurrence, when detected early, can often be treated with additional surgery alone, some physicians and patients still elect to avoid radiation therapy.

"It was felt, based upon individual trial data, that radiation therapy did not affect overall survival, but just decreased local relapse," says Dr. Jeff Abrams, chief of the Clinical Investigations Branch of NCI's Cancer Therapy Evaluation Program (CTEP).

The EBCTCG meta-analysis strongly suggests that this is *(continued on page 2)*

Director's Update

A Glimpse of Things to Come

It's been nearly 3 years since I announced the 2015 challenge goal to eliminate the suffering and death due to cancer. Inherent in establishing this challenge was a commitment: NCI would pledge to accelerate the pace of progress. It would commit to build on the past and provide the leadership for creating the future. It would pledge to being courageous when facts dictated a need for change, but also to being cooperative and collaborative when reality dictated that teamwork was needed to augment individual excellence.

Like any other journey to a far-off destination, this one will be marked by the achievement of milestones and memorable events. But, most importantly, the hallmark of these efforts will be consistent progress, always hastening its pace. And that's what we are beginning to see, whether it's the mounting successes with adjuvant therapy, progress with targeted agents such as trastuzumab (Herceptin) and bevacizumab (Avastin), or important new insights into oncogenesis and metastasis.

I believe the coming year will offer far more of the same. And such advances, when combined with the launch of new NCI-supported programs from proteomics to survivorship, are allowing us to witness the signs of a true metamorphosis *(continued on page 2)*

(Breast Cancer continued from page 1)
not the case. The study, published in the December 17 *Lancet*, analyzed individual data from 42,000 women, collected during 78 different randomized trials conducted since 1985. The availability of extensive 15-year survival data allowed the investigators to quantify the relationship between successful local control and long-term survivorship.

Radiation therapy after BCS was responsible for a highly significant reduction in local recurrence in all trials. Combined, the data showed a 19 percent absolute reduction of risk of recurrence at 5 years after treatment. None of the trials showed a significant reduction in 15-year mortality when analyzed on their own, but the meta-analysis revealed a highly significant absolute reduction of 5.4 percent.

For women with node-positive (high-risk) tumors who underwent full mastectomy, postoperative radiation therapy provided the same proportional survival benefit as did post-BCS radiation therapy.

The ratio of recurrence reduction to mortality reduction remained the same between subgroups. Subgroups at higher risk of recurrence derived a proportionally larger benefit from radiation therapy. The investigators concluded that "a local treatment difference that reduces the 5-year local recurrence risk by 20 percent would reduce the 15-year breast cancer mortality by 5.2 percent." In other words, says Dr. Abrams, "for every 4 local recurrences that are avoided by the addition of radiation therapy, about 1 breast cancer death could be avoided over the next 15 years."

"This paper really puts it together in a way that no other paper has done before," says Dr. Theodore Lawrence, chairman of Radiation Oncology at the University of Michigan Medical School. "We've known for many years that local control is improved with radiation therapy. We should now feel comfortable that, for high-risk women, radiation therapy improves survival."

The one drawback of radiation therapy noted by the EBCTCG was an increase in the incidence of secondary cancers, and in mortality from heart disease and lung cancer. However, the investigators emphasize that modern radiation therapy technology now minimizes the radiation doses to the heart, lungs, and contralateral breast tissue.

"There should be no increased risk of cardiac death in the modern era," adds Dr. Lawrence. "Women at high risk for recurrence should feel comfortable about getting radiation therapy." ◆

By Sharon Reynolds

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in cancer research—dramatic changes optimized to accelerate the pace of discovery, development, and delivery, but without sacrificing quality or safety.

Our growing support of genomics, nanotechnology, and advanced imaging technologies, for instance, are creating a new frontier for discovery, offering new tools for delving deeper into the mechanisms of disease, and ultimately defining potential weak points at which we can intervene. On the delivery end, we are working to develop and refine sophisticated computational models capable of analyzing tens of thousands of data points on cancer cells and the macro- and micro-environments in which they reside, to help plan and monitor treatments.

I also expect that this year will bring with it the continued expansion of team science. The increased sophistication of research into cancer initiation, promotion, and progression demands more integrative science—physics and biology, engineering and epidemiology. This shift is also spreading to NCI-designated Cancer Centers, which increasingly are working more as a single unit instead of individual programs, contributing heavily to initiatives such as the cancer Biomedical Informatics Grid™.

Other defining components of this metamorphosis include the forthcoming implementation of the NCI Clinical Trials Working Group's recommendations and the continued assessment of NCI's investment in translational research. These efforts are intended to create an integrated research portfolio that seamlessly spans the discovery-development-delivery continuum.

All of these examples are in step with the strategic approach NCI has been crafting to achieve the 2015 goal—an approach developed through the collective expertise of staff, our advisory boards, and the guidance of important constituents, such as the advocacy community.

The work over the past several years will culminate in the release later this month of a comprehensive strategic plan for achieving the 2015 goal, a document I'm particularly proud of and that I'll discuss further upon its release.

As I look to 2006 and beyond, I believe great things are going to happen—some will be fortuitous events, but most will be the result of having made strategic decisions that helped us achieve our desired end. ◆

Dr. Andrew C. von Eschenbach
Director, National Cancer Institute

Spotlight

Mice Show What Happens Before Tumors Spread

A recent study in mice reported that normal cells from bone marrow may play an important role in the spread of cancer and that blocking these cells could potentially prevent some tumors from invading new tissues (metastasizing).

By tracking the spread of tumors from the skin to the lungs of mice, researchers found that before cancer cells reached the lungs, bone marrow cells had migrated there first and modified the environment for their arrival.

Specifically, the bone marrow cells had created clusters, or niches, where circulating tumor cells could "dock" and grow. Nearly every new tumor that appeared in the lungs originated in one of the niches, the researchers reported in the December 8 *Nature*.

"Tumors recruit these bone marrow cells and use them to establish new tumors," says Dr. Shahin Rafii of Weill Medical College of Cornell University, who co-led the research.

In what Dr. Patricia Steeg of NCI's Center for Cancer Research (CCR), who wrote an accompanying commentary, called an ingenious experiment, the researchers showed how tumor cells and bone marrow cells migrated through the mice by tagging them with fluorescent proteins that could be seen through the microscope.

As a first step, the researchers eradicated the mouse bone marrow cells and replaced them with bone marrow cells that had been tagged green. Once these were established, the mice received skin injections of cancer cells—tagged red—that were expected to travel to the lungs.

The first cells to reach the lungs were the green bone marrow cells, 12 to 14 days after the injections. The red cancer cells appeared 18 days after the injections, and by day 23, small metastases had formed. Ninety-five percent of the tumors appeared at the precise locations where bone marrow cells had created niches.

The researchers then discovered that inhibiting the bone marrow cells could prevent metastases from forming in the mice.

Most cancer deaths occur because primary tumors invade new tissues, a process that involves cancer cells breaking off from tumors and traveling through the bloodstream to establish tumors elsewhere. If the new findings are confirmed in mice and extended to humans, then researchers might have unforeseen opportunities to intervene.

"This research opens the door to all of the early events in metastasis that we did not know about before," says study co-leader Dr. David Lyden, also of Cornell University. His laboratory will now search for the molecules that tumors presumably release into the bloodstream to mobilize bone marrow cells to go to particular regions.

Meanwhile, Dr. Rafii will try to understand how the bone marrow cells, which express a protein called vascular endothelial growth factor receptor 1 (VEGFR1), emerge from pockets deep within bone marrow. Preventing their emergence could prevent some metastases, he notes.

Cells that express VEGFR1 have been linked to the formation of blood vessels that supply tumors with nutrients, and in this study, the researchers report that the cells may also help cancer cells adhere to niches and develop into tumors.

The researchers also report finding clusters of cells expressing VEGFR1 in some human primary tumors and metastatic tissues.

Inhibiting VEGFR1 or other factors involved in the formation of human tumors would "be of great interest for potentially blocking metastasis," especially in cancer patients who are at high risk, said Dr. Steeg in her commentary.

The novelty of the study is the idea that before tumors arrive at their new destinations, nonmalignant cells play a major role in preparing the sites for them, says Dr. Lyden.

This idea raises many questions. For instance, might the risk of metastasis depend on how well a person mobilizes bone marrow cells? If so, this ability might be in part genetic, says Dr. Rafii, noting that some mouse strains are better at this than others.

Another question is whether chemotherapy used to prevent metastasis might be effective in some patients by preventing niches from forming. "Nobody knows how chemotherapy works," Dr. Rafii says. "We think it targets tumors, but it may be targeting the niches." ◆

By Edward R. Winstead

Cancer Research Highlights

Human Cells Develop Resistance to RNAi

Researchers have discovered that RNA interference (RNAi), a technology that uses a naturally occurring process to silence genes, may stop working in some cells after a period of time. RNAi is used to study gene function and has potential for treating some diseases.

The reported phenomenon appears similar to that of bacteria developing resistance to certain antibiotics after prolonged use, says lead researcher Dr. Zhi-Ming Zheng of NCI's CCR. The findings raise questions about RNAi's ability to treat diseases that require the silencing of genes over the long term.

"We were initially very surprised by the results," says Dr. Zheng. His team observed the effect several years ago while testing a short hairpin RNA (shRNA)—a mediator of RNAi—designed to silence two cancer-causing genes in human papillomavirus 16, which contributes to the development of cervical cancers.

The shRNA was effective in cancer cells from cervical cancer patients at first, but then stopped working, although it continued to be present. Further tests showed that no mutations had developed, according to findings published in the December 12 online edition of *Oncogene*. The researchers suggest that resistant cells may have produced a protein that interacts with an RNA molecule processed from the shRNA, preventing the silencing of targeted genes.

Chest X-Rays Detect Early Lung Cancer

Screening for lung cancer with chest x-rays can detect early lung cancer, but it also produces many false-positive test results which cause needless extra tests, according to preliminary results from the Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Trial. The report appears in the December 21 *Journal of the National Cancer Institute*.

"There is no accepted early screening technique for lung cancer," says Dr. Chris Berg, the NCI investigator who leads the PLCO trial. "The PLCO trial will show if chest x-rays, by catching lung cancer when it is still operable, can reduce the death rate from lung cancer."

Of the 67,038 men and women who received a baseline chest x-ray upon entering the trial, 5,991 (8.9 percent) had abnormal results that required follow-up. After undergoing additional tests, 126 (2.1 percent of the 5,991 participants with abnormal x-rays) were diagnosed with lung cancer.

"The positive predictive value was low," says Berg. "That means there were a lot of false-positives on the initial x-rays. If you get a positive result from a chest x-ray, the message is 'Don't panic.'" Berg notes that tissue variations and other benign factors can resemble tumors on an x-ray.

Of the cancers detected, 44 percent were stage I, meaning those patients were good candidates for surgery.

The group that received initial chest x-rays is being tracked alongside a control group of equal size that did not receive screening chest x-rays. Future analysis will reveal if the intervention group has a lower lung cancer mortality rate than the control group.

A separate NCI study, the National Lung Screening Trial, is under way comparing spiral CT with chest x-rays to see if that test might be better at reducing deaths from lung cancer.

Health Insurance and Quality of Cancer Treatment

Evidence-based treatment guidelines exist for almost all common types of cancer. However, many studies have noted disparities in the receipt of guidelines-based treatment, often along lines such as race, economic status, and age. A study by NCI's Division of Cancer Control and Population Sciences (DCCPS) published in the December 20 *Journal of Clinical Oncology* examined whether the receipt of guidelines-based treatment is also affected by the type of medical insurance held by patients. The study was based on a sample of more than 7,000 patients identified through the Surveillance, Epidemiology, and End Results (SEER) registries.

The investigators examined the association between treatment received and insurance status—private insurance, any Medicaid, Medicare only, or no insurance—for 10 common cancers with established evidence-based treatment guidelines. They also adjusted for other clinical and non-clinical factors such as cancer stage

(Highlights continued on page 5)

(Highlights continued from page 4)
at diagnosis, comorbidities, age, race, and marital status.

Levels of guidelines-based treatment proved to be lower than expected for all groups, but were significantly lower for patients who depended on Medicare or Medicaid alone for insurance. Also of particular note is that non-Hispanic black patients with Medicaid were significantly less likely than other groups to receive guidelines-based treatment, with only half receiving recommended therapy.

The investigators concluded that health insurance is one of many important variables that influence the receipt of guidelines-based therapy. In a follow-up study, they plan to examine how insurance status affects survival after cancer diagnosis. ◆

FDA Update

Sorafenib Approved for Advanced Kidney Cancer

The Food and Drug Administration (FDA) has approved sorafenib (Nexavar) for the treatment of advanced renal cell carcinoma. According to the drug's manufacturer, Bayer HealthCare AG, it is the first new drug approved for this indication in more than a decade.

The approval was based on the results of two clinical trials in which progression-free survival was significantly improved with sorafenib compared with placebo. According to the FDA, in the larger of the two phase III trials, most patients had previously received treatment with interleukin-2 or interferon. In that trial, median time to tumor progression or death in patients treated with sorafenib was 167 days compared with 84 days in patients who received placebo.

In preclinical studies, sorafenib was shown to inhibit multiple targets associated with tumor angiogenesis, including RAF kinase, VEGFR-2, VEGFR-3, PDGFR-ß, KIT, and FLT-3. The role that inhibition of a specific target plays in sorafenib's clinical activity, however, remains to be determined, explains Dr. Alison Martin, head of Genitourinary Therapeutics in NCI's CTEP.

Through a clinical trials agreement, NCI and Bayer are cosponsoring a phase III trial testing sorafenib in patients with unresectable, locally advanced, or stage IV melanoma, as well as numerous phase II trials exploring its activity in a broader range of advanced tumor types. A variety of other phase II studies currently open or planned for advanced kidney cancer will test whether adding targeted agents to sorafenib will improve its activity.

There is currently no known effective adjuvant therapy for patients with localized kidney cancer—that is, those who undergo resection but are at risk for relapse. Another oral multitargeted kinase inhibitor, sunitinib, has demonstrated early promising activity in advanced renal cancer, Dr. Martin says. Both sorafenib and sunitinib will be tested alone versus placebo in a large, three-arm, randomized trial of adjuvant therapy conducted by NCI-sponsored cooperative groups, led by the Eastern Cooperative Oncology Group, and in collaboration with Bayer and Pfizer. The trial is slated to open in the first quarter of 2006. ◆

Funding Opportunities

Pilot-Scale Libraries for High-Throughput Screening (P41)

RFA-RM-06-003

Letter of Intent Receipt Dates: Jan. 27, Sept. 1, 2006. Application Receipt Dates: Feb. 22, Sept. 22, 2006.

This is a renewal of RFA-RM-05-014. This funding opportunity will use the P41 award mechanism. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3311. Inquiries: Dr. John M. Schwab—schwabj@nigms.nih.gov.

Innovative Technologies for Molecular Analysis of Cancer (R21, R33)

RFA-CA-07-001

Letter of Intent Receipt Dates: Jan. 23, April 26, 2006. Application Receipt Dates: Feb. 22, May 26, 2006.

This is a renewal of RFA-CA-06-002. This funding opportunity will use the R21 and R33 award mechanisms. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3307. Inquiries: Dr. Gregory J. Downing—downingg@mail.nih.gov.

Application of Emerging Technologies for Cancer Research (R21, R21/R33, R33)

RFA-CA-07-002

Letter of Intent Receipt Dates: Jan. 23, April 26, 2006. Application Receipt Dates: Feb. 22, May 26, 2006.

This is a renewal of RFA-CA-06-003. This funding opportunity will use

(Funding Opportunities continued on page 6)

(Funding Opportunities continued from page 5)

the R21 and R33 award mechanisms. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3308. Inquiries: Dr. Gregory J. Downing—downingg@mail.nih.gov.

Innovations in Cancer Sample Preparation (R21, R33, R21/R33)

RFA-CA-07-003

Letter of Intent Receipt Dates: Jan. 23, April 26, 2006. Application Receipt Dates: Feb. 22, May 26, 2006.

This is a renewal of RFA-CA-06-004. This funding opportunity will use the R21 and R33 award mechanisms. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3309. Inquiries: Dr. Gregory J. Downing—downingg@mail.nih.gov.

Advanced Proteomic Platforms and Computational Sciences for the NCI Clinical Proteomic Technologies Initiative (R01, R21, R21/R33)

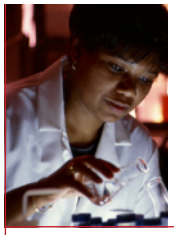
RFA-CA-07-005

Letter of Intent Receipt Date: March 11, 2006. Application Receipt Date: April 11, 2006.

This funding opportunity will use the R01, R21, and R33 award mechanisms. For more information, see http://cri.nci.nih.gov/4abst.cfm?initiativeparfa_id=3310. Inquiries: Dr. Gregory J. Downing—downingg@mail.nih.gov. ◆

Featured Meetings and Events

A calendar of scientific meetings and events sponsored by the National Institutes of Health (NIH) is available at http://calendar.nih.gov/cgi-bin/calendar. ◆



Featured Clinical Trial

Carnitine Supplementation for Cancer-Related Fatigue

Name of the Trial

Phase III Randomized Study of Levocarnitine (L-carnitine) for the Management of Fatigue in Cancer Patients (ECOG-4Z02). See the protocol summary at http://cancer.gov/clinicaltrials/ECOG-E4Z02.

Principal Investigators

Drs. Ricardo Cruciani and Russell Portenoy of the Eastern Cooperative Oncology Group

Why Is This Trial Important?

Fatigue is one of the most common side effects of cancer and cancer treatment. For many people with cancer, fatigue may become a critical issue in their lives, affecting their ability to work, to socialize, to relate to family and friends, and to maintain a healthy lifestyle. Despite its prevalence, however, there is no standard of care for the treatment of fatigue in cancer patients.

Low levels of the nutrient carnitine may contribute to feelings of fatigue in cancer patients. Carnitine plays an important role in cellular energy production by helping in the metabolism of fatty acids, which represent a major fuel source for tissues such as the heart and skeletal muscle. Levocarnitine (L-carnitine) is a nutritional supplement that may help alleviate fatigue by increasing the level of carnitine in the body. In this trial, researchers will assess the prevalence of carnitine deficiencies in cancer patients and examine the effect of carnitine supplementation in patients experiencing moderate to severe fatigue. Patients will be randomly assigned to receive levocarnitine or a placebo.

"Fatigue is a major complaint of many cancer patients, but it is one of the least studied complications of cancer and cancer treatment," said Dr. Cruciani. "With this trial, we hope to learn better how to improve the quality of life and well being of cancer patients."

Who Can Join This Trial?

Researchers seek to enroll 192 patients aged 18 and over who have been diagnosed with any invasive malignant disorder and have experienced moderate to severe fatigue. See the full list of eligibility criteria for this trial at http://cancer.gov/clinicaltrials/ECOG-E4Z02.

Where Is This Trial Taking Place?

Study sites in the United States are enrolling patients in this trial. See the list of study sites at http://cancer.gov/clinicaltrials/ECOG-E4Z02.

Contact Information

See the list of study contacts at http://cancer.gov/clinicaltrials/ECOG-E4Z02, or call NCI's Cancer Information Service at 1-800-4-CANCER (1-800-422-6237). The call is toll free and completely confidential. ◆

An archive of "Featured Clinical Trial" columns is available at http://cancer.gov/clinicaltrials/ft-all-featured-trials.

Notes

Mackall Takes On New Appointment

Dr. Crystal L. Mackall has been appointed acting chief of the Pediatric Oncology Branch (POB) in NCI's CCR. She is chief of the Immunology Section and has served as deputy chief of POB since January 2005. Dr. Mackall is board certified in internal medicine, pediatrics, and pediatric hematology/oncology, and has received international recognition for her work on T-cell immune reconstitution. Dr. Mackall leads an active translational research program, which incorporates basic studies in immunobiology with clinical trials of immunotherapy for pediatric cancer, for which she received an NCI Director's Award in 2003. She also received the NIH Distinguished Clinical Teacher Award in 2000 and the NCI Mentor of Merit Award in 2003.

NIH Review of Research Applications Expedited

A pilot study focused on new investigators applying for an R01 grant will speed up NIH peer reviews of research grant applications. The Center for Scientific Review (CSR) process currently takes 6 months and involves more than 15,000 outside scientific experts. "Our goal is to reduce the grant review process by half," said Dr. Toni Scarpa, director of CSR.

The study, to be initiated in February across 40 of CSR's scientific review panels, will allow researchers to readily address reviewer concerns by revising and resubmitting their applications for the next review cycle—more than 4 months earlier than before.

To evaluate the study, CSR will assess the views of applicants, reviewers, and both NIH and CSR staff. For more information, go to http://cms.csr.nih.gov.

Workshop Discusses Affinity Capture Resources in Proteomics

A critical component of NCI's Clinical Proteomic Technologies Initiative for Cancer is the development and characterization of reagents and resources. On December 12–13, NCI held the Proteomic Technologies Reagents Resource Workshop to discuss affinity capture resources in proteomics.

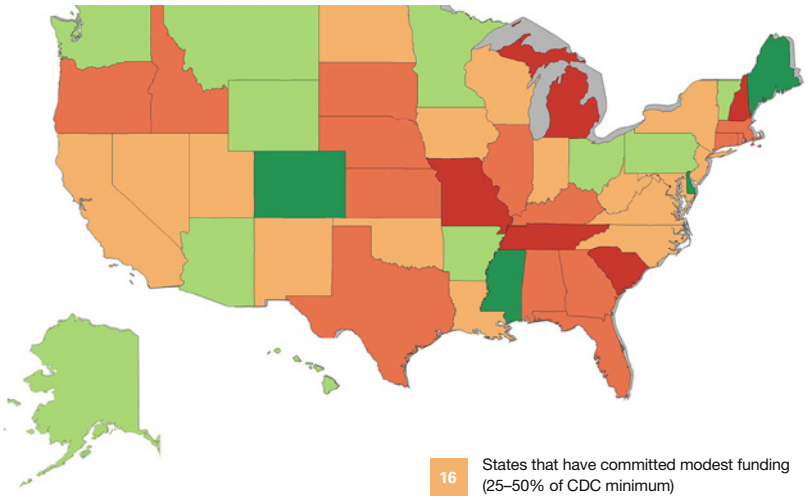
Participants, including leading proteomic investigators and representatives from 25 companies, discussed *in vitro* capture systems and applications, affinity characterization, validation, target selection, throughput capabilities, and database development. The Human Protein Atlas was also presented as an antibody characterization approach for the research community.

Proteomics holds potential for early diagnosis and treatment of cancer. The workshop identified roles NCI could play in overcoming barriers in proteomics, including antibody characterization, quality assurance, and availability.

State Tobacco Prevention Programs Inadequately Funded

States are once again failing to fund tobacco prevention and cessation programs at recommended levels despite collecting record amounts of tobacco-generated revenue from the 1998 tobacco settlement and tobacco taxes, according to the latest report from the Campaign for Tobacco-Free Kids, issued November 30. The report, *A Broken Promise to Our Children: The 1998 State Tobacco Settlement Seven Years Later*—cosponsored by the American Heart Association, American Cancer Society, and American Lung Association—finds that in the current budget year, only Maine, Colorado, Delaware, and Mississippi are funding tobacco prevention programs at a level that meets minimum recommendations of the U.S. Centers for Disease Control and Prevention (CDC). ◆

Status of State Funding of Tobacco Prevention



Source: Campaign for Tobacco-Free Kids

Community Update

NCI Issues Revised and Expanded Cancer Trends Progress Report

On December 22, NCI released the *Cancer Trends Progress Report: 2005 Update*, an online report that summarizes the nation's progress against cancer in relation to the "Healthy People 2010" targets developed by the U.S. Department of Health and Human Services. The revised and expanded cancer trends report, updated every 2 years since 2001, can be found at http://progressreport.cancer.gov.

The report includes several new features, including trends in specific cancer treatment practices. "This is the first time in the progress report that we've been able to summarize treatment trends data for breast and colorectal cancers," said Dr. Jon Kerner, deputy director of NCI's DCCPS. "This may make the progress report of more interest to clinicians."

For example, the section on breast cancer treatment trends notes that "The proportion of women with node-positive disease receiving appropriate treatment is high. Older women receive less treatment than younger women, but there are not major differences in treatment among major racial and ethnic groups." The section covers trends in breast-conserving surgery and multi-agent chemotherapy, along with other treatment modalities.

The *Cancer Trends Progress Report* is intended for policymakers, researchers, clinicians, and public health service providers, and offers updated national trends data on the continuum of cancer control from prevention, early detection, and diagnosis through treatment, survivorship, and end-of-life issues. It highlights both areas of progress and where the nation is losing ground in each aspect of the continuum.

> *"This is the first time in the progress report that we've been able to summarize treatment trends data for breast and colorectal cancer."*
> *— Dr. Jon Kerner*

"What makes the progress report unique is that it pulls all the trends data together and makes it very user-friendly for a much more diverse audience than those who tend to read the research journals," explained Dr. Kerner.

The 2005 update boasts improved access and usability features that were suggested by users of the 2001 and 2003 reports. It enables readers to select and print specific sections and subsections of the report, Dr. Kerner noted. "We think these improved features will prove to be helpful to policymakers and may be especially useful for legislative staff trying to provide information to their congressman or senator about a particular topic. Legislators tend to like one- to two-pagers, so you can really take the 2005 update and print it that way, he said."

Similarly, DCCPS added a "Google-like search capability so that, for example, those who may not necessarily recognize their issue about cancer control in the topic heading can plug in their own terms, and it will produce a list of every place where that particular issue is addressed in the update," Dr. Kerner said. Users also can download individual graphs and charts as PowerPoint slides to use in lectures and classroom handouts. Best of all, the 2005 update includes a mechanism with which users can "provide us feedback about things they'd like to see in the next update in 2007," he explained. ◆

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.

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