



LUNG CANCER RESEARCH FOUNDATION

Dedicated to *Discovery*
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www.lungfund.org

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Pathways

A NEWSLETTER FOR SUPPORTERS AND FRIENDS

THE FOUNDATION: OUR MISSION

The mission of the Lung Cancer Research Foundation is to support national research studies and activities focused on developing innovative strategies for better treatments, screening, and prevention of all cancers of the lung. New knowledge gained by funding scientific and clinical research initiatives will lead to more positive outcomes and improved quality of life for all lung cancer patients.



LCRF is a 501(c)(3) organization, and all contributions are fully tax-deductible. Your gift will advance our mission to support lung cancer research.

Donations can be made via credit card on www.lungfund.org or by calling our office at 646.290.5154.

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SPRING 2011, VOL 4

A NEWSLETTER FOR SUPPORTERS AND FRIENDS

WWW.LUNGFUND.ORG

LCRF RECEIVES \$2.1 MILLION – LARGEST GIFT SINCE FOUNDING

In October, LCRF received a significant \$2.1 million donation to fund scientific and clinical research initiatives, the largest donation in the foundation's history. The gift was made by Mrs. Laure Sudreau-Rippe and her husband, Mr. William C. Rippe. The connection to lung cancer is personal for the couple. Mr. Rippe, a non-smoker, was diagnosed in 2008 with lung cancer while Mrs. Sudreau-Rippe has lost three members of her immediate family to cancer. "I lost my father to lung cancer when I was 21, and now my husband has it," said Mrs. Sudreau-Rippe. "I want to make a difference. It's time lung cancer research and awareness got more recognition, and I hope this gift is the first step in



New LCRF board member Laure Sudreau-Rippe with LCRF President Laurie Carson

a new direction." In 2009, in honor of his 50th birthday, Mr. Rippe chose LCRF as a vehicle to raise funds for lung cancer research. "We picked LCRF for this donation because of their approach to scientific research. We want science to benefit everyone, and we think this is the future to finding a cure for all cancers," said Mrs. Sudreau-Rippe.

"It's time lung cancer research and awareness got more recognition, and I hope this gift is the first step in a new direction."

The donation will go towards LCRF's grant program, which supports national research studies aimed at developing innovative strategies for better treatments, screening, and prevention of all cancers of the lung. "The impact that this gift has on the Foundation at this critical point in our growth is enormous. It is a transformational gift, and it enables us to expand our grant program in a very meaningful and measurable way," said Laurie Carson, LCRF President and Founder. LCRF is so grateful to the Rippes and is proud to add them to its distinguished Board of Directors.



DESPITE CHALLENGES LCRF GRANTEE RECEIVES \$1.8 MILLION NCI GRANT

The road to funding for Dr. Christopher Bakkenist's research has not been easy. The University of Pittsburgh scientist is an LCRF 2009 and 2010 grantee and the recipient of the 2009 LCRF Scientific Merit Award. Surprisingly, even with LCRF funding, Dr. Bakkenist has had his lab threatened due to the inability to cover expenses. In fact, while LCRF funded his research, he applied to the National Institutes of Health (NIH) 11 times. In February, he received word that he was awarded a Research Project Grant (RO1) from the National Cancer Institute (NCI) in the amount of \$1.8 million. This award will now provide him with security for the next five years. Dr. Bakkenist's story



Dr. Christopher Bakkenist

highlights some of the challenges that young investigators face, underscoring the need for increased funding. "Every dollar directed towards research counts," said Executive Director Deborah Walsh.

The goal of the LCRF grant program is to fund results-driven research, and this award clearly shows how LCRF is positively impacting the study of lung cancer. "Thanks to LCRF, my lab survived and will now grow. Cancer research is not for the faint of heart. It requires drive and determination and nerves of steel. But it is worth it!" said Dr. Bakkenist.

MESSAGE FROM THE PRESIDENT AND EXECUTIVE DIRECTOR



Laurie Carson and Deborah Walsh

Dear Friends,

2010 was an exciting and transformational year for the Lung Cancer Research Foundation (LCRF)! Because of all of your loyal support, we celebrated our fifth anniversary and successfully navigated a turbulent economy. It was also a good time to reflect on our past accomplishments and an opportunity to look ahead to the future.

Since the inception of LCRF in 2005, we have raised more than \$6 million to expedite research. Our grant program is growing in both its scope and reputation. In just three years, we have funded 34 grants in 14 states, totaling nearly \$2 million, and in the fall of this year, LCRF will fund another \$1 million in research grants nationwide. These early accomplishments illustrate how we are setting a standard in research funding for lung cancer and fulfilling our mission in a significant way.

In this issue of Pathways, you will learn more about how LCRF has been working diligently to raise funds for lung cancer research. The stories featured on the cover page highlight two of our greatest successes of 2010, beginning with a significant and historical gift by a donor in support of our grant program and a notable story recognizing how LCRF funding of \$100,000 translated into a \$ 1.8 million federal grant for a recent LCRF grantee. Additionally on pages six and seven, you will be inspired by stories of giving, survival and loss.

Thanks to your valued involvement, LCRF is on solid footing and well-positioned for the future. Motivated by our recent progress comes the realization that much more work still needs to be done in order to move the needle further in lung cancer research. We are ever hopeful that 2011 will be a promising year in that direction and look to you for your continued support.

Laurie C. Carson

President and Founder

Deborah E. Walsh

Executive Director

LCRF VIDEO HIGHLIGHTS LUNG CANCER AWARENESS LUNCHEON



Dr. Mark Socinski



Kimberly Kravis Schulhof with Deputy Mayor of New York Patricia Harris

In celebration of National Lung Cancer Awareness Month, LCRF hosted the 5th Annual Lung Cancer Awareness Luncheon at The Waldorf=Astoria on November 1, 2010. More than 200 friends and supporters were present to view LCRF's informational video, which featured the Foundation's accomplishments over the last five years. Segments included interviews with President Laurie Carson and LCRF Scientific Merit Award Recipient Christopher Bakkenist, as well as with donors and survivors.

Also at the luncheon, Dr. Mark Socinski of UNC Lineberger Comprehensive Cancer Center gave a compelling keynote speech highlighting new advances in research and treatment. In addition, lung cancer survivor Clara Dale shared her moving experience with the disease and spoke about hope, survivorship and the invisibility of lung cancer.

Prior to the luncheon, a free and public symposium was held to educate attendees with the most up-to-date information on lung cancer research and trends. For more information on the Symposium, please refer to the enclosed article written in *Oncology Times*.

The luncheon raised more than \$250,000 for innovative lung cancer research. To celebrate the occasion, Mayor Michael Bloomberg proclaimed November Lung Cancer Awareness Month in the city of New York.

5TH ANNIVERSARY BRINGS RECORD CROWD

More than 1,100 people participated in LCRF's 5th Annual *Strides for Life* fun run/walk in Southampton, New York. Gorgeous weather welcomed the event held on August 15th, which raised more than \$430,000. With team participation at an all-time high, "Team Hedi" led by LCRF Vice President Kimberly Kravis Schulhof, remains the largest, with more than 100 members.

by Tory Burch in commemoration of the fifth anniversary. To date, *Strides for Life* has raised more than \$2.1 million for lung cancer research. LCRF wishes to thank all who participated and contributed to its success.

The 6th Annual *Strides for Life* event will be held on Sunday, August 14, 2011. To register or for more information on starting a team, please call 646.290.5154.

Other highlights included the return of Rosanna Scotto of Fox 5 News as Mistress of Ceremonies and a "Run, Breathe, Live" T-shirt designed



Left above: Team Hedi
Left below: Team Sonia
Above: Tory Burch

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CALENDAR OF EVENTS

APRIL 1-30 The Endless Race
Virtual Strides for Life—AZ

APRIL 30 *Spin for Life*
Flywheel Sports
New York City

MAY 1 TD Bank 5 Boro Bike Tour
New York City

AUGUST 14 *6th Annual Strides for Life*
Southampton, NY

NOVEMBER 1 Lung Cancer Awareness
Public Symposium
The Times Center
New York City

NOVEMBER 2 Lung Cancer
Awareness Luncheon
The Pierre
New York City

LCRF FUNDS RESEARCH TOTALING \$750,000

During the 2010 grant cycle, LCRF received 62 grant submissions from leading cancer centers throughout the country. As a result of the LCRF medical advisory peer review, 15 new grants totaling \$750,000 have been awarded to leading cancer institutes throughout the country. Since the inception of the LCRF grant program in 2007, the Foundation has funded 34 grants in 14 states, totaling nearly \$2 million for critical lung cancer research.

2010 GRANT RECIPIENTS

American College of Chest Physicians

To support the 3rd ACCP Lung Cancer Guidelines Conference in 2011.

Dana-Farber Cancer Institute**

Donald W. Kufe, M.D.

Development of a New Therapy for Lung Cancer Resistant to Existing Therapies

To explore the mechanism by which a new compound likely to be tested in humans can destroy lung cancer cells resistant to current drugs. By understanding these pathways, it may be possible to select lung cancer patients who will be most sensitive to its effect.

Dana-Farber Cancer Institute*

Matthew Meyerson, M.D., Ph.D.

Understanding Genetic Mutations in Lung Cancer

To study genes that are frequently mutated in lung cancer as possible targets for creating improved therapy for lung cancer.

Duke University Medical Center

Michael J. Campa, Ph.D.

Identifying an Immune Response in Patients with Lung Cancer

This lab will explore their recent discovery of an immune marker that appears to predict patients with lung cancer who do not demonstrate a tendency for their cancer to spread outside of the lung. By better understanding how this mechanism may work, it may be possible to use this knowledge for more effective outcomes of care.

M.D. Anderson Cancer Center

John V. Heymach, M.D., Ph.D.

Understanding What Genetic Mutations in Lung Cancer are Functionally Important

This grant request proposes to apply a technique that could characterize the most significant gene alterations that affect cell function and growth. If successful, this could potentially lead to better stratification and prioritization of gene targets for research in lung cancer.

M.D. Anderson Cancer Center

Humam Kadara, Ph.D.

Understanding the Genetic Signature of Lung Cancer in Non-Smokers

Non-smoker lung cancer is the 7th leading cause of death worldwide. There is strong evidence that the genetic makeup of such cancers differs from that of smokers and this grant will support more detailed evaluation of these differences.

M.D. Anderson Cancer Center

James W. Welsh, M.D.

Developing a New Method of Reducing Resistance to Lung Cancer Therapy

Recent discoveries have identified a potential way that lung cancer cells not only become resistant to treatment with radiation or drugs, but also develop an ability to develop metastases. This proposal will study that mechanism in detailed models with the aim of applying this new information to techniques to reduce resistance of the cancer to effective therapy but also to potentially block the development of distant sites of disease.

Memorial Sloan-Kettering Cancer Center

Yixuan Gong, Ph.D.

A Study of How Common Mutations in Lung Cancer Genes may Cause this Cancer

They will study the associated effects of the two most common gene mutations in lung cancer. A deeper understanding of how these gene abnormalities affect cell activities may lead to insights of more successful therapy.

Pennsylvania State University

Arun Sharma, Ph.D.

Creating a New Drug for Lung Cancer

A new class of drugs with early evidence of positive effect in lung cancer cell growth will be tested in animal models to better understand how it is working and what subtypes of lung cancer might be most affected.

Stanford University

Viswam S. Nair, M.D.

Studying the Genetic Nature of Lung Cancer in Patients Who Have Very Positive PET Scans at the Time of Diagnosis

PET scans are commonly used in patients who have a diagnosis of lung cancer to stage the extent of their disease. Patients with high PET scan uptake often have more aggressive disease than patients with lower levels of uptake. This study will evaluate genetic differences between such patient groups as a means of potentially identifying factors that lead to different natural history of the disease.

University of Chicago Medical Center

Ralph R. Weichselbaum, M.D.

Understanding Genetic Markers in Lung Cancers as Potential Ways to Improve Response to Therapy

To study how micro RNAs regulate sets of genes that are associated with aggressive forms of lung cancer. This understanding could lead to therapeutic opportunities to interfere with these relationships and cause cell destruction.

University of Florida

Bradford S. Hoppe, M.D.

How Does a New Form of Radiation Therapy (Proton Therapy) Cause an Immune Response to Lung Cancer?

It is now recognized that radiation therapy can cause an auto-immune effect against lung cancer cells which could possibly enhance cell destruction beyond the radiation effect itself. They propose to study this mechanism as related to proton therapy which is an emerging new type of radiation treatment. Their findings could lead to predictions regarding patients who may respond more effectively to radiation therapy.

University of Kentucky

Esther P. Black, Ph.D.

A Study of the Genetic Characterization of Lung Cancer that Could Affect the Tendency to Metastasize

They will explore the interactions of cells called tumor associated macrophages. These cells are thought to affect the ability of a lung cancer cell to grow beyond its local environment. Better understanding of the immune function of these cells and their effect on the genetic makeup of lung cancer cells may lead to new therapy options.

University of Louisville

Jorge G. Gomez-Gutierrez, Ph.D.

A New Model for Viral Therapy for Lung Cancer

Their research focuses on a new method for potentially more effective viral gene transfer to treat lung cancer. Their work represents a model for highly specific targeted therapy aimed at interrupting specific cell pathways unique to lung cancer cells thus possibly avoiding damage to non-cancer cells.

University of Pittsburgh*

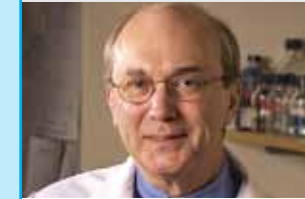
Christopher Bakkenist, Ph.D.

Targeting Lung Cancer by Inhibiting Pathways of DNA Repair

This grant continues prior support of LCRF in identification of ways to block a cellular pathway that appears commonly associated with lung cancer cell growth. Better understanding of the blocking effect and associated cell death could lead to new therapy for lung cancers that display this pathway.

* This project has received second-year funding.
** This project was awarded the LCRF Scientific Merit Award acknowledging the investigator whose proposal was selected for outstanding overall merit by the LCRF Medical Advisory peer review.

2010 LCRF SCIENTIFIC MERIT AWARD RECIPIENT JOINS LCRF MEDICAL ADVISORY BOARD



Dr. Donald Kufe

The Lung Cancer Research Foundation is thrilled to have Donald W. Kufe, M.D., join the Foundation's distinguished Medical Advisory Board. Dr. Kufe, Professor of Medicine at Harvard Medical School and Physician at the Dana-Farber Cancer Institute, accepted LCRF's invitation after being presented with the 2010 LCRF Scientific Merit Award. Dr. Jim Dougherty, LCRF's scientific advisor, presented Dr. Kufe with this award at the Foundation's luncheon in November.

The LCRF Scientific Merit Award was established in 2008 to acknowledge the scientific investigator whose research

proposal was selected for outstanding overall merit by the LCRF Medical Advisory peer review. Dr. Kufe was selected from over 60 applicants.

Q&A with Dr. Kufe

Why did you choose to focus your studies on lung cancer?

Lung cancer is the most common cause of cancer-related death in men and women. Patients with lung cancer, particularly the more prevalent type known as non-small cell lung cancer (NSCLC), have limited treatment options. New therapeutic approaches are thus desperately needed for this disease.

What are the greatest challenges in lung cancer research?

Surgery, radiotherapy and chemotherapy with cytotoxic agents are the mainstay of lung cancer treatment. Certain NSCLCs have mutations in the EGFR gene that confer sensitivity to the targeted agents, erlotinib and gefitinib. However, these tumors ultimately develop resistance to therapy. In this context, the challenge is to identify novel, previously unexplored targets for more effective lung cancer treatment.

How will this grant help your laboratory?

Our research has identified a protein, designated MUC1-C, that is aberrantly expressed at high levels on lung cancer cells. Moreover, drugs have been developed that block the cancer-causing function of this protein. Funding from the LCRF is supporting studies that are of importance to determining how MUC1-C inhibitors block survival of NSCLC cells in our laboratory and in animal models.

What does this grant mean to you?

The lead MUC1-C inhibitor has recently received approval from the Food and Drug Administration to commence evaluation in Phase I clinical trials. The findings from the work supported by the LCRF grant will provide the basis for performing clinical studies of this MUC1-C inhibitor in patients with NSCLC who have tumors that are resistant to currently available therapies.

UPDATE ON NATIONAL LUNG CANCER SCREENING TRIAL

In November 2010, initial findings from the National Lung Screening Trial (NLST) were released. These findings reported positive benefits for CT screening vs. chest X rays for high risk populations of current and former heavy smokers. The study showed a 20% decreased risk of dying from lung cancer for those screened with annual CT scans compared to chest X rays.

Although this is important new information for this high-risk population, CT scan screening identifies abnormalities in 1 of 4 people tested, most of which are not cancer. It is also not clear from this study that other groups with less or no smoking exposure will gain the same benefit.

No consensus opinion or recommendations on screening for lung cancer have yet been reached by national expert groups. This study and other previously reported population outcomes are being evaluated. In the interim, the LCRF recommends that you discuss screening for lung cancer with your individual practitioner who will take into consideration this data, your specific history and individual risk factors.

CLARA'S STORY: HOPE & RESILIENCE



Lung cancer survivor Clara Dale

In May of 2001, I was diagnosed with non-small cell lung cancer. In July I had an upper right lobectomy. In September, on the 11th, the Twin Towers fell. Seven years later, Wall Street fell. I can't help but tie these events loosely together, as they all bear some of the same characteristics. Cancer, 911, market collapse—"crisis" is not too strong a word for any of them. Each was a shock. Each felt like an attack. Each felt random. Perhaps because of the turmoil of outside events, I very much wanted my own journey with lung cancer to be different. One of the hardest aspects for me was discerning what was random and what was not. The queasy slide into the impact of a

it downgrades lung cancer to a lifestyle disease. It implies that you brought this on yourself by smoking a highly addictive, heavily marketed product. Two great achievements of the AIDS community are: their refusal to accept stigmatization or downgrading, and their successful demands for research into the causes and treatments for AIDS. No one confronts AIDS patients with questions about how they contracted AIDS. We in the lung cancer community must demand no less in terms of respect and research! Another aftershock was the discovery that lung cancer is the biggest cancer bully on the block, but is woefully underfunded. It affects more people each year than breast, colon, pancreatic and prostate cancers—combined. It attacks more women annually than breast, uterine and ovarian cancers—combined. It kills twice as many women as breast cancer, yet, in 2009, breast cancer received \$27,500 per patient in research dollars, to lung cancer's \$1,250—which was actually DOWN \$622 from 2005.

Until we come together to demand and support research in this widespread, under-challenged disease, each diagnosis will, quite possibly, seem random, even to doctors. Only with vocal advocacy, and unequivocal collaboration will attention be brought to lung cancer research. For me, I am not engaged in a battle with lung cancer, nor is lung cancer a terrorist; it is a disease. I don't know why or how I got lung cancer, but I do know for certain, that with courage, solidarity, and relentless perseverance, we will discover the answers to this mystery—and on that great day, lung cancer will never again be considered a random event.



Clara Dale speaks out for lung cancer at SiriusXM Radio along with Laurie Carson and LCRF Medical Advisory Board Member Dr. Marc Ladanyi.

"We in the lung cancer community must demand no less in terms of respect and research!"

solid diagnosis was, for me emotionally, worse than the actual treatment. Knowing my own tendency to overthink things, I immediately called the psychiatry department at the hospital where I went for cancer treatment, Memorial Sloan-Kettering. It was a huge relief to enlist the support of people on the inside of the cancer tent. I am a non-smoker. Neither my parents nor my husband smoked after we were married. I learned how difficult it is to accept the word "random," when a doctor actually suggested that I got lung cancer because I went to too many restaurants!

One of the aftershocks of my diagnosis was the discovery of the degree to which lung cancer is a stigmatized disease. To a person, the first question out of everyone's mouth was, "Did you smoke?" At first, I responded with a defensive "No!" but now I simply say, "No, but why do you ask?" Because I believe that seemingly harmless question, "Did you smoke?" is part of the stigmatization process,

AND THE RIDE CONTINUES



Cyclists John Hurley and Eric Mansfield

Eric Mansfield is a man inspired. Last year he spent months training fellow Boston native John Hurley, who cycled 3,800 miles from California to New Hampshire on behalf of LCRF. This year Eric will embark on his own journey across the country when he attempts a 3,600-mile ride from Palm Springs, CA, to Amesbury, MA, in an impressive 29 days.

Eric has been biking, riding and training for more than 24 years. A seventh-generation iron worker, Eric's goal is to raise \$15,000 for LCRF. "After witnessing first hand John's experience with LCRF and the impact that it had on him personally, I couldn't see myself riding for any other organization. I hope that my passion for cycling inspires others to develop a similar passion about lung cancer," said Mr. Mansfield.

To learn more about Eric's race, go to www.ericpedalsamerica.blogspot.com. To help him exceed his \$15,000 goal go to www.lungfund.org. To follow Eric's race, which begins on April 24th, friend us on Facebook.

"92 DEGREES & SUNNY" REMEMBERING LORETTE



Lorette Pucylowski (center) with her husband, Carl, and daughter, Kristene Sciandra, at Strides for Life in 2008.

Lorette Pucylowski, a long-time supporter of LCRF, passed away in December of 2010 after a valiant ten year battle with lung cancer. Known for her floor walks with fellow patients and her positive outlook on life, Lorette wore Halloween wigs to every chemotherapy treatment. Her signature phrase was, "Good morning. It's 92 degrees and sunny."

Lorette's relationship with LCRF dates back to her earlier involvement with Founder Laurie Carson's "Steps for Breath" now called *Strides for Life*. Each year, Lorette proudly wore race bib #1. "My reality is *Strides for Life*," Lorette said. "That is my focus."

In 2008, Lorette organized "Lorette's Team" at the Southampton fun run/walk and was proud to see her family and friends wearing shirts in her favorite color, orange.

Lorette has been an inspiration to us all and will be deeply missed. She is survived by her husband, Carl and daughter, Kristene. To read more about Lorette's courageous fight in her own words, visit the 2009 issue of Pathways at www.lungfund.org.



Lung Cancer Awareness Symposium Highlights Necessary Focus Areas for Research

BY BRANDE VICTORIAN

NEW YORK CITY—Leading medical experts gathered here earlier this month to jump start Lung Cancer Awareness Month with an open public forum discussing significant clinical discoveries and key areas for further investigation in lung cancer research.

Held by the Lung Cancer Research Foundation, the panel coincides with the organization's 5th Annual Lung Cancer Awareness Luncheon, a fundraising event to help support research projects.

Julia Rowland, PhD, Director of the Office of Cancer Survivorship at the National Cancer Institute, was one of three speakers at the symposium, titled Key Pieces in the Lung Cancer Puzzle.

"When I was asked to be a speaker, I thought, 'What a wonderful opportunity to talk to this audience about survivorship and pair that with lung cancer,' because I think many in this country don't put those two words together and yet this is an area where we need more focused attention.

"We have almost 371,000 individuals in this country who are survivors of lung cancer and we may think that that's an impressive figure until we realize that over 222,000 people will be diagnosed with lung cancer this year alone; then we realize 371,000 isn't enough."

'Tissue is the Issue'

In order to improve survivorship at an acceptable safety level, diagnostic methodologies must improve, said Mark Socinski, MD, Director of the Multidisciplinary Thoracic Oncology Program at UNC Lineberger Comprehensive Cancer Center.

"In this country, historically, we have provided our pathologists with small tissue samples. One of the messages that has to go out initially is that tissue is the issue. It starts at the time of initial diagnosis with getting enough tissue to allow the pathologist to tell you more definitely whether the cancer is squamous or non-squamous, and then in those patients who you want to interrogate for certain molecular abnormalities, you need to have the tissue to do that."

While investigators are increasingly looking at blood and sputum for tumor analysis, Marc Ladanyi, MD, Director of the Laboratory of Diagnostic Molecular Pathology at Memorial Sloan-Kettering Cancer Center, said it's important to emphasize that these techniques are just in the research stage and not available for routine use.

"At the moment we have to focus on obtaining sufficient tumor tissue at the time of diagnosis so that there is sufficient material for us to examine the genetic changes in the tumor cells."

A lot of thought is being given as to how to scale up mutation screening of tissue samples in

lung cancer, Dr. Ladanyi added, noting the screening efforts currently in place for colon cancer and melanoma. "This idea that we have to determine the genetic changes in the tumor cells of each patient is being rolled out pretty much across all cancers and this is the tip of the iceberg.

"We are all trying to figure out how we are going to extract all of this information from relatively small biopsies and how we're going to perform all this testing in a timely manner."

Survivorship and the Teachable Moment

Emphasizing the dependency of therapies on accurate tumor staging, Dr. Socinski said that while diagnostic methods, and furthermore treatment, have improved, an enormous survival benefit has not yet been documented.

"The major change that has happened in that setting is the adoption, based on multiple clinical trials, of chemotherapy following an operation which improves the survival or the ultimate cure rate of this disease.

"When you look back at the initial trials in breast cancer using what is now considered old-fashioned chemotherapy, the impact that those trials had is really identical to what we see in lung cancer. The role of adjuvant therapy is very important and we were not necessarily doing that five or six years ago.

"We may argue about the best drugs to use in certain patients,

but this is certainly now the standard of care."

Nonetheless, the increase in patient survival, although it may be modest, has presented a new area of focus on survivorship and the long-term effects of cancer diagnosis and treatment.

"One of the reasons our office was created is because more and more people were living

"There is an aging stigma and a smoking stigma attached to this disease, making it a challenge for us to make a public human cry about the epidemic that we are facing."

months, years, decades after cancer diagnosis and the medical community was poorly equipped to determine the follow up for these individuals," Dr. Rowland said.

Literature documenting survivors' experiences has shown that patients are remarkably resilient in their ability to tolerate aggressive regimens. That said, being told that you are cancer free, does not mean that you are free of the disease, she added.

"Some of these symptoms are acute and go away—for

nausea, vomiting, hair loss, and anemia—and when treatment stops those things resolve fairly quickly, but there are a number of insidious or persistent effects like chronic fatigue, memory problems, depression, and sexual dysfunction that go on for months or years after treatment exposure, and those are the ones that we are trying to address.”

Currently, children, with a cure rate of 80%-90%, are the most documented survivors, allowing for several years of follow up after diagnosis. Researchers are now trying to take what they’ve learned from those patients and translate it to adult survivors.

A movement is under way at many centers to provide treatment summaries for patients detailing all of their exposures, what therapies they received, and treatment doses, along with a survivorship care plan identifying what follow-up tests need to be done and on what basis and who will be responsible for providing care (*OT 8/10/10, 3/10/09, 9/10/07, 7/10/07 issues*).

“An additional piece that we’re beginning to add is taking advantage of what we call the teachable moment—making lifestyle changes that can improve the patient’s overall well-being,” Dr. Rowland said.

Mutations and their Relationship to Smoking

The most obvious teachable moment in lung cancer is smoking cessation, Dr. Rowland added, citing details of a study of 383 dyads of survivors and caregivers.

“We found that 19% of lung cancer survivors were still smoking and 25% of their caregivers were still smoking. We have a lot of work to do. This is not acceptable and we need to do these studies much more often.”

Studies have shown an association of variations in constitutional DNA at the regions controlling the nicotine receptor where people with a certain variant at that location are more



(Left to right) MARK SOCINSKI, MD, JULIA ROWLAND, PHD, and MARC LADANYI, MD

likely to develop lung cancer, Dr. Ladanyi said. However it has been debated whether the variant is indirectly associated with a propensity to nicotine addiction or whether there is a direct effect on lung cancer in those patients, he added.

On the flip side, mutations that were originally identified in never smokers, specifically patients with the epidermal growth factor receptor gene (EGFR), have also been found to occur in a lower rate in smokers.

“In our experience, almost any patient, even one who doesn’t have a history of smoking, should have their tumor tested for EGFR mutations because what this suggests to us is that there are actually smokers who develop lung cancer which may be unrelated to smoking.

“Furthermore, we know from previous studies that tobacco smoke causes a particular type of mutation in DNA, and we can

look for those mutations in those genes and distinguish the mutations that are likely to occur due to tobacco smoke and the ones that are less likely to occur.”

Mutations in the EGFR gene account for about 20% of lung adenocarcinomas, with mutations in the KRAS gene causing 25%; EML4-ALK mutations account for another 5% of these cancers.

“All of these mutations are mutually exclusive, so what’s happening is we’re trying to fill out the rest of the pie chart in terms of what drives these subgroups of lung cancer,” Dr. Ladanyi said.

Critical Study Populations

Despite killing more women than breast cancer an all gynecologic cancers, lung cancer remains much less understood in women than other malignancies, Dr. Socinski said.

“Breast cancer death rates have been pretty stable at 40,000 deaths per year and we have 80,000 women dying of lung cancer each year. That has paralleled tobacco consumption to a certain extent, but there is a sense that this is a population in which the epidemiology is very poorly understood.”

EGFR mutations are more likely to occur in women, although the cause of this finding is unknown. Furthermore, almost without exception, women do better than men in terms of surviving lung cancer regardless of disease stage or the impact of chemotherapy with a hazard ratio of 0.75-0.78, which translates into a 25% improvement in survivorship benefit for just being female, Dr. Socinski added.

“There is a lot more research to be done from an epidemiological point of view as well as a biological point of view to explain this issue. We’ve done a great job with many things, but we haven’t done a great job with that.”

Another challenge in lung cancer is that the vast majority of people diagnosed with lung cancer are age 65 and older, while most of the work is being done in individuals who are pediatric cancer survivors or in their middle years, not in the prevalent population of survivors.

“This is something that we need to be addressing,” Dr. Rowland said. “There is an aging stigma and there is a smoking stigma all attached to this disease and that makes it a challenge for us to make a public human cry about the epidemic that we are facing.”



LCRF Medical/Scientific Advisor JAMES DOUGHERTY, MD (left), presented DONALD KUFE, MD, Professor of Medicine at Harvard Medical School and Distinguished Physician at Dana-Farber Cancer Institute, with the 2010 Scientific Merit Award for his work on the role of the MUC1 oncoprotein in the development of human cancers.