THE CANCER LETTER

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An Unlucky Streak? Doctors Analyze Errors As Another Cancer Center Offers Apology

Last week yet another prestigious academic cancer center issued an apology for a serious treatment error.

This time the institution was Memorial Sloan-Kettering Cancer Center. The error: a neurosurgeon had mistakenly operated on the wrong part of the brain of a cancer patient, the cancer center officials said.

"Our standards of care were not met in this case," Joseph Simone, Memorial's physician-in-chief, said in a statement June 21. "We have

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In Brief

Wieand Named Director, Biostatistical Center For NSABP; LeMaistre Honored By AMA

HARRY SAMUEL WIEAND has been named director of the Biostatistical Center for the National Surgical Adjuvant Breast and Bowel Project, headquartered at the Univ. of Pittsburgh. Wieand was director of cancer center statistics at the Mayo Clinic, where he was instrumental in the design and analysis of studies by the North Central Cancer Treatment Group. Prior to joining the Mayo Clinic in 1985, Wieand was an associate professor of biostatistics at Pitt's Graduate School of Public Health, and has collaborated on a number of NSABP studies. "I'm delighted to return to the Pittsburgh area and join my colleagues in pursing these important studies," Wieand said. "In the next few months, I anticipate we will be publishing the results of our recently completed trials and opening several new studies for breast and bowel cancers." NSABP is chaired by Norman Wolmark, principal investigator for the NSABP Operations Office. . . . **CHARLES LEMAISTRE**, president of M.D. Anderson Cancer Center, received the Distinguished Service Award from the American Medical Association for meritorious service to the science and art of medicine. "He is an outstanding physician, teacher, health advocate, and champion of public policy supporting health care and higher education," said Robert McAfee, AMA president. "In each capacity, he has become a recognized national leader through his contributions." LeMaistre was the youngest member of the first US Surgeon General's Advisory Committee on Smoking and Health, which in 1964 identified cigarettes as a major health hazard. He became president of M.D. Anderson in 1978. . . . **B. J. KENNEDY,** credited with founding the field of medical oncology, received the Outstanding Achievement Award as a distinguished graduate of the Univ. of Minnesota, where he has taught since 1952. . . . **NEEN HUNT** was appointed executive vice-president of the Albert and Mary Lasker

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Recent Errors Prompt Centers To Review Causes, Prevention

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acknowledged that a mistake was made, and have extended a heartfelt apology to the patient's family."

Memorial officials said the error occurred because the surgeon had brought the wrong set of films into the operating room. Following the incident, the surgeon's privileges have been withdrawn, and an internal investigation has been initiated. Subsequently, the patient was operated on by another member of the staff.

Memorial is the third major academic cancer center to admit a serious treatment error in the past four months. In March, Dana-Farber Cancer Institute *accepted responsibility for causing the death of* Boston Globe reporter Betsy Lehman, who had received an overdose of cyclophosphamide while undergoing treatment for breast cancer. Another patient also received an overdose of the drug, Dana-Farber officials said (**The Cancer Letter**, March 31).

In a similar incident last week, the Univ. of Chicago admitted fault in the death of a testicular cancer patient who had received an overdose of cisplatin (**The Cancer Letter**, June 23).

Though serious errors have occurred in cancer care in the past, few people outside the local medical communities heard about them. The publicity generated by the Dana-Farber case appears to have changed that, instantly elevating reports of errors at cancer centers to the level of national news stories.

"The recent mistakes have forced everyone in the field to review their policies and procedures," an oncology program administrator said in an informal survey conducted by **The Cancer Letter** earlier this week. "The silver lining in the cloud is that other errors may be prevented because, following the Dana-Farber incident, the leadership at virtually every cancer center said, `There but for the grace of God goes my institution.'"

Patient advocates agree.

"The Betsy Lehman incident has changed things, and that's what Betsy would have wanted," Natalie Davis Spingarn, an author and vice chair of the National Coalition for Cancer Survivorship, said to **The Cancer Letter**. "What Betsy wrote about, and what I write about, is the bad effect of bad communication and the good effect of good communication."

As a consequence of the Dana-Farber incident, an open and immediate admission has become the only acceptable method for handling treatment errors, Spingarn said. "The best doctors know that they can't be arrogant anymore," she said.

Following Memorial's report of the neurosurgery error, **The Cancer Letter** asked eight prominent cancer specialists to comment on the incidence and significance of such mistakes. The cancer specialists were invited to speak on condition that their names and the names of their institutions would not be used.

Judging by the interviews, the recent errors have made physicians and administrators focus on the possible causes of errors, their frequency as well as possible methods of prevention.

Another theme that emerged in interviews was the negative impact of managed care on the work environment at cancer centers. To cut costs, hospitals are cutting support staff and restricting the specialists' contact with patients.

Nearly all the individuals interviewed said serious treatment errors are relatively rare. The frequency of serious errors at major cancer centers was estimated to range between one incident per year to one every four years.

"It's like the Army; people get killed in the Army because they are using dangerous weapons," said one community-based medical oncologist whose practice is active in clinical trials. "In oncology, we use dangerous weapons, too. It's unfortunate, but mistakes occur."

Excerpts from the interviews follow:

Beware of the Mantra of Cost-Containment

Medical oncologist, academic cancer center:

Everyone is chanting the mantra of cost-containment.

THE CANCER LETTER

Editors: **Kirsten Boyd Goldberg**
Paul Goldberg
Founder & Contributing Editor: **Jerry D. Boyd**
P.O. Box 15189, Washington, D.C. 20003
Tel. (202) 543-7665 Fax: (202) 543-6879
E-Mail: 73322.2044@compuserve.com
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And one of the ways they are doing it is by cutting staff. So, we may not have the luxury of having people whose job it was to just make sure that the right films are in the right boxes.

We may not have the luxury of having some of the time that it takes to sit down and think about what you are doing rather than just say, 'I've got to see the next patient in 15 minutes, or else I am going to fall behind and not generate enough income.'

That's one of the worrisome trends I see: in order to keep head above water, medical centers are cutting staff in ways that may impair patient care.

No matter what you do, errors are going to happen. You just have to make sure that you minimize them. I think that there is one chemotherapy dosing error in medical centers I have been in per year. Considering the number of patients treated, considering the number of chemotherapy doses given, it is a fraction of 1 percent.

It is probably .01 or .001 of all the doses that we give. Because the safeguards that we have in place work.

Managed Care May Erode Understanding of Cases

Surgical oncologist, academic cancer center:

In surgery, when somebody removes the wrong side in the case of an amputation, for example, this is known immediately.

It's known by the entire operating room staff to start with, and it just goes from there to become known by all the surgeons in the city.

This is not something that's kept secret, and the institutions understand that it can't be kept a secret. The best approach in this kind of a situation is to have forthright disclosure as quickly as possible. The worst thing you want is to be accused of a cover-up *in a case of clear medical negligence.*

What may have changed as a result of the Dana-Farber case is that there is pressure to disclose this on a national level. The disclosure of misadventures and mishaps on a national level was not done in the past.

Now, these mishaps occur very, very rarely. That raises the question as to whether the whole system has to be changed because of very infrequent, albeit extremely tragic, events. The question is how best to implement processes so that the likelihood of it is even more remote.

It would be interesting to examine the circumstances under which these episodes are taking place.

They are too few—you are never going to get a pattern—but the question as to whether managed care is resulting in an increased incidence is something that merits consideration.

Consider the fact that you cannot admit a patient the night before surgery anymore. You no longer have an opportunity to reevaluate that patient the night before.

You see the patient the first thing in the morning, and usually when they are in the operating room, because somebody else does the history and physical.

Obviously, the push to cut down on hospitalization has resulted in less contact between the physician and the patient. That's incontrovertible. Does that, in turn, result in misadventures?

That's worth finding out.

Battle Arrogance in the System

Oncology program administrator:

A nurse on an inpatient oncology unit is typically responsible for the medicines of five or six patients, and each patient may in a 12-hour shift receive 15 or 20 medicines. That's over 100 medicines given in a 12-hour shift. There is a likelihood that there will be human error.

We have somehow given the people the right to expect perfection. And it's coming back to haunt us.

To reduce the incidence of errors, you have to constantly battle arrogance in the system.

None of us can ever get to the point where we think we are infallible. Or where we cut corners. And we have to remember with every patient that we treat, we have to do it with as much diligence as if they were the first patient we ever treated. And that's hard to do when you are talking about high volume.

As resources diminish, and as people are asked to do more with less, the risk of error goes up, because we are being pushed to be very efficient, and to deliver the same quality of care with fewer support services and fewer resources. And when that happens, the risk of error is inversely related to the adequacy of the support staff.

What I've been disappointed in is that I've seen the press approaching this as a Pulitzer Prize opportunity. Let's do a Jim-and-Tammy-Bakker and get a Pulitzer Prize for exposing them for fraud and abuse. Let's just kill the health care industry.

And I am not sure that helps anybody.

Dana-Farber Incident: Cause to Review Safeguards

Medical oncologist, academic cancer center:

Clearly, errors are made, and they are frequently handled by the risk management departments. When they are handled in litigation or by risk management, they are usually under confidentiality agreements.

There is no way of knowing whether there is an increase in the frequency of errors or that this is just a reporting phenomenon.

I think the Farber incident has caused all cancer centers to go back and review very carefully their chemotherapy administration policies and procedures, and to toughen up any systems they have in place in order to provide a fail-safe mechanism.

Our institution has always had a computer system. Following the Farber incident, we toughened up the computer flagging. The incident also stimulated us to review all our chemotherapy policies and procedures. While they were very good in the first place, we have added another layer of checks and balances to provide what we hope will be a fail-safe mechanism.

Empower Staff to Question Chemo Orders

Medical oncologist, academic cancer center.

It's a problem that is not solved by triply redundant systems. Human nature being what it is, there will be mistakes that result from lapses of good judgment.

At major cancer centers serious errors occur once every two years, on the average. And errors happen even if there is oversight on the part of the attending fellows and the pharmacy. The institutions involved are probably the ones with the best reputations.

What needs to be done is more of what we are doing. Which is to restrict the ordering of chemotherapy to the most senior faculty, so that they are familiar with the regimens. And it's important to understand that regimens change all the time.

Secondly, every person involved in the administration of chemotherapy needs to be better trained and regularly reviewed. In addition, every person involved needs to be empowered to question the order.

Patient Management Conference Every Day

Medical oncologist in private practice:

The key to not making mistakes is communication.

What we do in our practice, which is relatively unusual, is to have a patient management conference every day. Three doctors in our practice, the four staff nurses, a couple of research nurses, the lab tech, and some of the front office folks go through the next day's patients, patient-by-patient, and we talk about each one.

Now, most of the time we don't spend very much time talking about each patient, but it's an opportunity for all of us to look at what's happening to our patients.

I learned a long time ago that you have to listen to the patient. That way the patient will have no cause to say, 'Ah, doctor, I told you so!'

I hate hearing that, and because I hate hearing that, I don't want to be in the position of having this said to me.

So if someone says, 'I took this chemo and my mouth fell out,' then one of the things to think of is, Did you get the right chemo? Did you get the right dose of the right chemo?

Taking the patients' complaints very seriously is very important.

Unneeded Treatments Pose Greater Problem

Medical oncologist, academic cancer center:

These are terrible mistakes when someone gets five times or ten times the dose of something associated with a bone marrow transplant. But a much more basic question is: How many people are getting very intensive chemotherapy regimens that are of no proven efficacy?

Dosing errors, though they are tragic, are in some way deck chairs on the Titanic in the context of misapplied treatments. The potential misuse of intensive therapy is more important than the fine points of what was given or not in a very small proportion of the cases. Focusing on the errors may distract attention from the issue of who should get these treatments.

In this context, managed care has an up side and a down side.

Hospitals are under increasing pressure to cut expenses. Much of the work that used to be done by very sophisticated nurses is being done by people who are lower and lower down in the hierarchy. And, of course, that increases the possibility of mistakes.

That is the down side of managed care.

Now, the up side. As people try to reduce costs and take harder and harder looks at investigational therapies, they are driven in some respect by financial considerations, but insofar as physicians would be more and more constrained in what they could do and more and more directed toward a consensus opinion, lives might be saved.

If you say, no, you can't do aggressive therapy in everybody just because you want to do it, but you have to follow these boundary guidelines, then in fact

you may expose fewer people to risk.

So, if I had to weigh the pluses and the minuses of managed care, I see managed care decreasing the number of these mistakes because it would decrease the number of mistakes of choice of treatments, even though the price that's paid is that individual episodes [of treatment errors] might increase because less and less experienced people are delivering care.

There is nothing worse than a mistake in a treatment that's not needed. It's the ultimate worst.

Victims of Our Own Progress

Medical oncologist, academic cancer center:

This kind of stuff has happened ever since people began to practice medicine.

I'd say that at a major cancer center there is probably one of these cases every two to three years. Sometimes they go to court, sometimes not.

When you look at the potential for making errors—and that means tens of thousands of medical procedures, the complicated nature of it all, then one major mistake very two to three years may be the best we can do.

I don't think the practice of medicine has deteriorated, despite published reports. Fifty years ago, you never heard of such cases. Even 20 years ago, the potential for these things to go awry wasn't there because the powerful drugs and complicated procedures weren't there.

In a way, we are victims of our own progress.

In Brief: K Awards Clarification

(Continued from page 1)

Foundation and executive director of the Mary Woodard Lasker Charitable Trust. Hunt was executive vice-president and chief operating officer of the United *Nations Association-USA*. . . . **CLARIFICATION:** Program announcements published in the June 9 issue of **The Cancer Letter** failed to state that NCI does not support leadership K07 awards and that the K01s are limited to the Minority Faculty Development Award. The major K-series awards supported by NCI are the K07 Preventive Oncology Academic Award and the K08 Mentored Clinical Scientist Development Award. For further information, contact John Schneider, NCI Cancer Training Branch, tel: 301/496-8580. . . . **THOMAS CURETON** was named clinical administrator for the Lombardi Cancer Center at Georgetown Univ. He was a consultant for the Association of Community Cancer Centers, and previously was administrator for the Virginia Mason Cancer Center in Seattle, WA.

DCE Advisors Okay Grant Program On Lung Cancer

Advisors to the NCI Div. of Cancer Etiology approved a new grant program that would provide $6 million over the next four years to fund interdisciplinary studies on lung adenocarcinoma.

The DCE Board of Scientific Counselors also gave concept approval for the establishment of a family registry for epidemiologic studies of individuals at high risk of colorectal cancer, as well as a program announcement to encourage grant applications on the study of phytoestrogens.

In addition, two contract recompetitions were approved at the board's meeting earlier this month.

Excerpts of the text of the concept statements follow:

Interdisciplinary Studies on Lung Adenocarcinoma. Concept for new RFA, first year funding $1.5 million, four years. Epidemiology & Biostatistics Program, Extramural Programs Branch, Program Director: A.R. Patel.

The purpose of this proposed RFA is to promote innovative research in order to better understand the etiology of lung adenocarcinoma, time trends in incidence, and means of prevention. The reasons for the increases in adenocarcinoma of the lung in the US remain to be determined. Changing diagnostic trends should be considered as one possible reason, and examined through standardized review of a sample series of cases that are representative of those occurring since the 1950s. There is a paucity of understanding of the risk factors for specific types of lung cancer; few agents have been linked to specific histologic types. Further research is needed to elucidate the etiologic factors that influence the upwards time trends in lung adenocarcinoma.

Although cigarette smoking is the leading cause of lung cancer, the persistence of tobacco smoking provides a strong impetus for monitoring lung cancer trends, especially the rising occurrence of lung adenocarcinoma. Knowledge of mechanisms of induction of lung adenocarcinoma may also lead to rational approaches to lung cancer prevention and a better understanding of host factors that influence cancer susceptibility. In addition, there is a need to identify risk factors that may account for the more rapid increases in lung adenocarcinoma rates among US women than men.

The areas of research listed below are not intended to be all-inclusive, but are designed to give the applicant some direction for the types of research that the NCI is interested in stimulating to enhance knowledge about the etiology of lung adenocarcinoma and means for prevention.

1. Epidemiologic studies of lung adenocarcinoma in smokers, with detailed collection of tobacco use data, assessment of risk modifiers, and evaluation of susceptibility factors; pooled analysis of existing data sets for lung adenocarcinoma; studies of non-tobacco environmental/occupational exposures and lung adenocarcinoma risk.

2. Studies of host susceptibility factors related to adenocarcinoma, such as P450 expression/ polymorphisms, glutathione S-transferase enzymes, hormonal factors, and diet.

3. Studies of the molecular mechanisms of lung adenocarcinoma in laboratory animals and humans to assess the role of novel oncogenes or tumor suppressor genes; investigation of carcinogen metabolic activation and detoxification in human pulmonary cells; development of biomarkers of chemicals in tobacco products, in the general environment or in occupational settings that induce lung adenocarcinoma, including DNA adducts. Consideration should also be given to DNA adduct repair in human pulmonary cells.

Cooperative Family Registry For Epidemiologic Studies of Colorectal Cancer. Concept for a new RFA (cooperative agreement), first year of funding $2 million, total four years. Epidemiology & Biostatistics Program, Extramural Programs Branch, Program Coordinator: Daniela Seminara.

In 1994, the Extramural Programs Branch issued an RFA for cooperative agreements to establish a cooperative Family Registry for epidemiologic and interdisciplinary studies of individuals at high-risk for breast cancer. The purpose of this proposed cooperative agreement, which responds to the above and to specific recommendations from a recent workshop on "Genetic Screening for Colorectal Cancer," is to complement and expand the previous family registry initiative by creating a Cooperative Family Registry for Colorectal Cancer.

The purpose of this RFA is to stimulate cooperative efforts for the establishment of a Cooperative Family Registry for epidemiologic and interdisciplinary studies of individuals at high risk for colorectal cancer. A population-based approach, utilizing resources such as the SEER registries or other cancer registries, is strongly encouraged.

The Family Registry will provide resources to enable the participant organizations to identify individuals with a family history of colorectal cancer and familial cancer syndromes including colorectal cancer; collect and define the related pedigrees; collect clinical, epidemiologic, and exposure data to be correlated with pedigree and genetic information. Support for the collection of biological specimens, such as blood samples, paraffin blocks, and fresh-frozen tissue will be included. This registry is intended to assist investigators funded through other sources by providing the data and biological specimens that can be used for etiologic studies and prevention and treatment-oriented research.

The mechanism of support will be the cooperative agreement, or U01. The participant organizations will be responsible for defining their scientific objectives and approaches. The purpose of this RFA is to encourage collaborations among several organizations (institutes or consortia) toward the common goal of the establishment of coordinated colorectal cancer family registries, in order to facilitate and support the progress of this interdisciplinary area of research. Substantial NCI involvement is anticipated in order to facilitate interaction between the groups, to coordinate their efforts with other ongoing initiatives, to promote the awareness and use of this resource among the scientific community, and to solicit the presentation of research proposals requesting the utilization of the pedigree information, epidemiological data and research specimens collected by the Family Registry. It is anticipated that prioritization of the proposals requesting access to the Family Registry resources will be made by an Advisory Committee (AC) composed by senior scientists from the research community at large, with experience in multidisciplinary and translational colon cancer research. The AC membership will be determined by a Steering Committee (SC) composed of the Principal Investigators and other scientists from the Family Registry and NCI.

The collaborative groups will develop common protocols for:

—ascertainment of colorectal cancer families, o epidemiologic and clinical data collection, validation and management (statistical support),

—collection and banking of biological specimens (blood and tissues)~ o limited follow-up for outcome, recurrence and mortality,

—appropriate genetic counseling of family members.

Limited funding will be available for pilot or feasibility studies using the family registry resources, to provide preliminary data for the subsequent submission of regular research grant applications in epidemiologic, prevention or basic biological research.

Studies on Phytoestrogen Interaction with Cancer. Concept for a Program Announcement. Chemical And Physical Carcinogenesis Branch, Project Officer: Harold Seifried.

Due to the plethora of reports in the popular scientific literature associating the phytoestrogens with chemoprevention and/or cancer treatment potential, as well as reports stressing the dangers of potential reproductive problems following exposure to these compounds, the scientific community recognized a need to assemble a diverse group of experts from various biological and chemical disciplines in order to review

the state of our knowledge and discuss the opportunities for further research in this area of plant-derived estrogens. NCI's Div. of Cancer Etiology conducted a workshop entitled "Dietary Phytoestrogens: Cancer Cause or Prevention?" in September 1994.

The goal of this Program Announcement is to stimulate research on the role of phytoestrogens in the etiology and biology of malignancy and/or chemoprevention. Observations to date seem to indicate primarily an effect on late-occurring events in the tumorigenic process and not on tumor initiation. Other toxicological, reproductive and physicochemical properties of the general class of compounds known as phytoestrogens are also of interest and concern.

Studies under this Program Announcement might focus on the: (1) development of syntheses for standardized sources of phytoestrogens; (2) development and validation of rapid and accurate analytical methods; (3) measurement of toxicologic and pharmacokinetic parameters; (4) determination of effects on reproduction and maturation; (5) further verification of chemoprevention in animal models, as well as in human subjects; and (6) determination of mechanisms of action.

Synthesis of Derivatives of Polynuclear Aromatic Hydrocarbons. Recompetition of contracts held by SRI International and Eagle Picher Industries Inc. First year award $972,450 for two awards, total five years. Chemical And Physical Carcinogenesis Branch, Project Officer: Harold Seifried.

The goal of this project is the synthesis, purification and characterization of selected derivatives and metabolites (primarily oxygenated) of polycyclic aromatic hydrocarbons (PAHs) in gram quantities. The types of compounds include dihydrodiols, phenols, quinones, enantiomeric diolepoxides, epoxides, dialdehydes resulting from the cleavage of vicinally-disubstituted oxygenated derivatives, alkyl and hydroxyalkyl-substituted parent hydrocarbons, conjugated derivatives (chemical or biosynthetic such as glutathiones, glucuronides, and sulfates), and labeled (3H, 13C, 14C) analogs. The compounds are required in carcinogenesis research as authentic standards and substrates to aid in the elucidation of the pathways of carcinogen metabolism, activation and molecular mechanism of action.

Since very few of the PAH metabolites are available commercially, and most investigators do not have the luxury of extensive organic and analytical chemistry services at their disposal, these contracts provide for a reliable and reasonably priced source of well-characterized standards. Recent effort under these contracts has made a considerable spectrum of methylchrysenes, dibenzopyrenes and benzofluoranthene metabolite standards available for the first time. These are an important class of environmental carcinogens which have been added to the EPA's Toxic Release Inventory under the Emergency Planning and Community Right to Know Act. PAH-DNA adduct standards for use in the Randerath 32P-postlabeling assay are now also being produced via direct synthesis so that investigators, for the first time, can identify specific radiographic spots in their chromatograms.

Support Services for Epidemiologic Studies to Address Emergent Cancer Questions. Recompetition of master agreements, proposed first year award $900,000, total four years. Epidemiology & Biostatistics Program, Project Officers: Martha Linet, Robert Hoover, John Boice Jr., Linda Brown.

The objectives of this procurement are to obtain support services for the conduct, on short notice, of epidemiologic studies of newly emergent cancer issues of national visibilit.v and importance. The procurement mechanism to be used is the Master Agreement. Qualified organizations will be competitively selected to be awarded Master Agreements which entitle them to bid on subsequent RFPs for Orders to perform support services for specific studies. Technical review is performed at the outset by a Division of Extramural Activities contract review committee, which judges the capabilit.v of the institutions to provide the variety of epidemiologic support services required. Selection of a contractor for an individual project is then made competitively from among groups with Master Agreements who submit technical and business proposals for the particular project.

NIH Meeting: Human Subjects

NIH and FDA sponsor a series of workshops on responsibilities of researchers, Institutional Review Boards, and institutional officials for the protection of human subjects in research. The workshops are open to everyone with an interest in research involving human subjects.

The current schedule includes the following:

Contemporary Human Subject Issues in Academic Research—Sept 18-19, Univ. of Mississippi, Oxford, MS. Registration: D. Russell Cooper, tel: 601/232-7282, fax: 601/232-5138.

Inquiries: For further information regarding these workshops or future NIH/FDA National Human Subject Protections Workshops, contact: Darlene Marie Ross, Office for Protection from Research Risks, NIH, 6100 Executive Blvd, Suite 3B01, Rockville, MD 20892-7507, tel: 301/496-8101 x233, fax: 301/402-0527.

Cancer Meetings Listed For July, August, September

July

International Confederation of Childhood Cancer Parent Organizations—July 9-11, Crystal City, VA. Contact Candlelighters Childhood Cancer Foundation, tel: 301/657-8401.

Candlelighters Childhood Cancer Foundation 25th Anniversary Conference—July 12-16, Crystal City, VA. Contact CCCF, tel: 301/657-8401.

National Kidney Cancer Association Annual Convention—July 19-22, Washington, DC. Contact: NKCA, tel: 708/332-1051, fax: 708/328-4425.

President's Cancer Panel—July 20, Chicago, IL. Hotel Intercontinental, 8 a.m.-5 p.m. Topic: Progress *in Leukemia*. Contact: Nora Winfrey, NCI, tel: 301/496-1148, fax: 301/402-1508.

Radiation Therapy Oncology Group Semi-Annual Meeting—July 20-23, Philadelphia, PA. Contact Nancy Smith, RTOG, 1101 Market St., Suite 1400, Philadelphia, PA 19107, tel: 215/574-3205.

International Congress of Immunology—July 23-29, San Francisco, CA. Contact: Secretariat, tel: 301/530-7010, fax: 301/530-7014.

International Conference on Head and Neck Cancer—July 28-Aug. 1, Toronto, Canada. Contact: Ruth Enquist, Tel: 507/285-1523, FAX 507/281-8328.

1995 Summer Mini-Symposium on Cell Cycle Regulation—July 28, Frederick, MD. Contact: Patti Hall, Foundation for Advanced Cancer Studies Inc. tel: 410/658-2882; FAX 410/658-3799.

Symposium on Cancer Research in San Antonio--July 28, San Antonio, TX. Contact Sally Hubbard, San Antonio Cancer Institute, tel: 210/616-5590, fax: 210/616-5981.

August

International Society for Experimental Hematology—Aug. 27-31, Dusseldorf, Germany. Contact: CPO Hanser Service, PO Box 1221, D-22882, Hamburg-Barsbuttel, Germany, tel: 49-40-670-8820, fax: 49-40-670-3283.

Dietary Phytochemicals in Cancer Prevention and Treatment—Aug. 31-Sept. 1, Washington, DC. Contact: American Institute for Cancer Research, Secretariat, tel: 703/683-6334, fax: 703/683-6407.

September

International Conference on Prostate Cancer Early Detection and Control: What Should Be The Health Message?—Sept. 6-7, Atlanta, GA. Contact Centers for Disease Control, Steve Wyatt, tel: 404/639-3311.

DNA Topoisomerases in Therapy—Sept. 6-8, Amsterdam, The Netherlands. Contact: Secretariat, Amstelveenseweeg 601, c/o AZVU, PO Box 7057 MB Amsterdam, The Netherlands, tel: 31-(0)20-644-4500 or 644-4550, fax: 31-(0)20-644-4551.

Anderson Network Patient Conference—Sept. 8-9, Houston, TX. Contact Pam Hamre, Conference Services, tel: 713/792-2222, fax: 713/794-1724.

Medical Oncology: A Comprehensive Review—Sept. 11-15, Houston, TX. Contact Conference Services, M.D. Anderson Cancer Center, tel: 713/792-2222, fax: 713/794-1724.

International Congress on Hormones and Cancer—Sept. 16-20, Quebec City, Canada. Contact: Secretariat, Laval Univ. Medical Center, tel: 418/654-2144, fax: 418/654-2714.

The Regulation of Cell Growth—Sept. 18-19, Evanston, IL. Contact Robert H. Lurie Cancer Center, tel: 312/908-5258, fax: 312/908-1372.

Association of Community Cancer Centers National Oncology Economics Conference—Sept. 20-23, Marina del Rey, CA. Contact ACCC, Wanda Neal, tel: 301/984-9496, fax: 301/770-1949.

Future

Great Lakes Cancer Nursing Conference—Oct. 10-11, Lansing, MI. Contact Vicki Rakowski, ACS Michigan Division, tel: 517/371-2920.

Cytokines and Cytokine Receptors—Oct. 14-18, Lake George, NY. Contact American Association for Cancer Research, tel: 215/440-9300, fax: 215/440-9313.

Practice Challenges: The Experts Speak Out on Breast Cancer—Oct. 18, Eatontown, NJ. Contact Ellen Cosgrove, Monmouth Medical Center, tel: 908/870-5451, fax: 908/229-3582.

Chemotherapy Foundation Symposium--Nov. 1-3, New York City. Contact: Jaclyn Silverman, Mount Sinai School of Medicine, tel: 212/241-6772 or fax: 212/996-5787.

NCI Contract Award

Title: Primary rodent production centers

Contractor: Charles River Laboratories, Wilmington, MA, $7,059,827.