

SPECTRUM

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In recognition of April as "Cancer Control Month" by the American Cancer Society, *SPECTRUM* is devoting this entire issue to a survey of the role Lahey Clinic plays in the diagnosis and treatment of this disease, acknowledged as one of the most serious illnesses facing medicine today.

A major cancer treatment center, at Lahey Clinic virtually every medical and surgical department and laboratory is involved either directly or indirectly.

Although it would be impossible to treat every facet of the cancer program at Lahey in depth, it is hoped through this issue to produce an awareness of the broad scope of the Lahey program and to indicate some of the significant achievements made to date as well as to note challenges that lie ahead.

What is Cancer?

Cancer is a disease that is characterized by an abnormal, uncontrolled growth and spread of cells. Normally, the cells of the body grow in a controlled pattern and do not invade outside a specific area, but, for some reason, the control is defective when a cancer appears. The cause of the disease is unknown today although special types of viruses may be involved. Toxic substances such as cigarette smoke are clearly implicated in some cancers.

Cancer strikes at any age, affecting children as well as adults. This year more than one million Americans will be under medical care for cancer. Some cancers grow and spread slowly, others rapidly. Virtually all parts of the human body are subject to disease in one or another of its forms.

The Interdisciplinary Approach

"There never was a time when one doctor could care completely for all of the problems of cancer in any one patient. The time is now here for the use

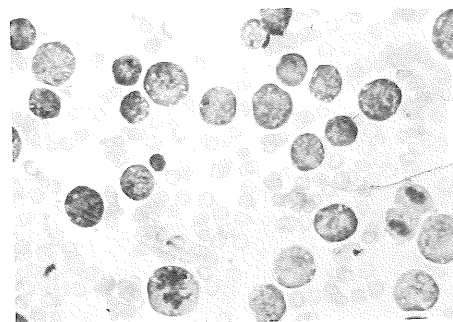
of all modalities of therapy, and knowledge, experience and technical skill from all specialties of medicine, surgery, and laboratory science in the care of any one patient with cancer. This is the interdisciplinary approach . . . Widespread adoption of the interdisciplinary attack on every cancer patient will bring greater benefits to the cancer patient in the community hospital as well as to the patient in the teaching or research center." (From *Cancer, A Manual for Practitioners*, Fourth Edition, 2nd Printing, American Cancer Society (Massachusetts Division) 1968.)

Long recognized as one of the nation's and, in fact, the world's foremost medical groups, Lahey Clinic has traditionally employed the team concept and brought to bear the talent of its multispecialty group on the problems of the individual patient. This is particularly true in the case of cancer as often many different organs and systems are involved. It is not uncommon for two, three, and often more staff physicians to consult in the management of a particular case.

Four major areas can be explored in an effort to report on the entire Lahey approach: diagnosis, treatment, research and education.

Diagnosis

It is a proven fact that early identification of the disease is one of the most important features of successful treatment. Cancer typically begins as a "localized" disease, in the majority of cases originating on the surface of some tissue such as the skin, lining of the stomach, intestine, prostate gland or elsewhere. Such cancers often, however, penetrate beyond the surface, "invade" the underlying tissues and continue to grow. As long as the cells remain where the disease started, it is said to be "localized." However, in later phases some of the cells become detached and



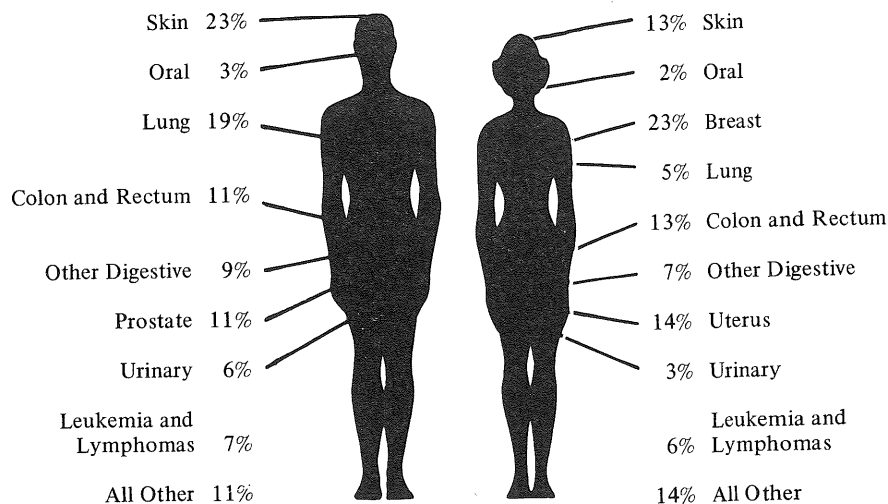
THE CULPRIT - Shown above are cancer cells growing free in body cavity fluid. Dark, stained cells show evidence of rapid growth. The lightly stained cells are red blood cells.

are carried through the lymph system or blood vessels to other parts of the body. This spreading process is known as "metastasis." Sometimes trapped in a lymph node, the spread may be retarded and only "regional organ involvement" takes place. But, if left untreated, the cancer cells eventually spread to all parts of the body causing "advanced" stages of the disease. In many cases, patients with cancer are referred to the Clinic by their own physicians for further studies and care. On the other hand, through routine examination, as for example the yearly check-up, and as a result of the thoroughness of the Staff in treating often unrelated illnesses, cancer is discovered early, and steps are taken immediately to provide the appropriate treatment.

In one of the most advanced of departments, Diagnostic Radiology, a series of both routine and sophisticated x-ray procedures take place daily enabling the physician to pinpoint the location of tumors, growths and other abnormalities. Radioisotopes, for example, can be used to portray the extent of invasion of the liver by cancer cells, mammography helps to locate cancer of the breast, and gastro-

DIAGNOSIS continued page 3...

CANCER INCIDENCE BY SITE AND SEX



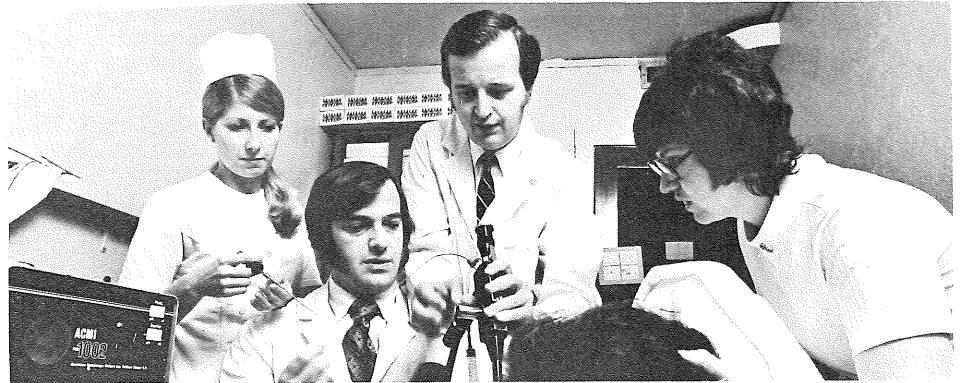
DIAGNOSIS from page 2 ...

intestinal fluoroscopy can visualize abnormalities within the stomach and intestines. Correlations between the existence of cancer and abnormal cells in a patient's blood, as in the case of leukemia, can be defined through laboratory testing. Both the special hematology laboratory and the main Clinic laboratory assist in the analysis of blood samples.

Often the existence of cancer cells can best be determined by a surgical procedure through which the doctor can actually excise tissue from body organs or glands. Examined microscopically in the pathology laboratory, the cellular make-up of the tissue can be described and precise identification made, not only of the type of malignancy that may exist but also the extent to which the disease may have spread. Frozen sections of tissue taken during an operation can be immediately analyzed in the laboratory and the result presented to the surgeon enabling him to make an on-the-spot decision as to whether, for example, a cancer exists in which case his surgical procedure may involve a radical approach, or whether, in fact, the tumor may be benign (nonmalignant) in which case a more simple approach may be utilized. It is important to note here that, for many years, Dr. Shields Warren and now Dr. William A. Meissner and their pathology laboratory at the Deaconess Hospital have provided an excellence in laboratory science and service in a close relationship with the Clinic. Doctor Warren served for many years as a Trustee of the Foundation, and Dr. Meissner was made an honorary member of the Clinic Alumni Association at the 1973 reunion.

One of the most common forms of cancer is that which appears on the skin. Ranging from advanced irritations caused by overexposure to the sun to lesions caused by the abnormal growth of moles, such forms are diagnosed in the Department of Dermatology. Fortunately, early detection is quite often possible, leading to rapid cure.

In other tests, sputum can be examined to detect the possibility of cancer existing in the lungs or bronchial tubes. Examination of urine samples also identifies abnormal cells that may come from disease in the kidney, bladder or prostate. Recognized today as a necessary part of every woman's physical examination is the "pap" smear which enables the physician to discover cancers of the cervix and uterus. Breast cancer can often be detected in its earliest stages by a simple self-examination. The technique of such an examination is explained by Staff physicians with the aid of an audiovisual tape cassette produced by the American Cancer Society. As in the case of other tests, the self-examination should take place at stated, regular intervals and



S. Peter Gibb, M.D. (standing, center) performs an endoscopy on patient as (L-R) Kathy Bielawa, R.N., Enrique Urella, M.D. (former Lahey Clinic Resident) and Pat Smith, R.N. assist.

irregularities noted such as lumps reported immediately to the physician.

Another important test in the prevention of cancer is a quick and painless rectal examination commonly called the "Procto" or proctosigmoidoscopy. A hollow tube or scope is inserted into the rectum enabling the examining physician to view approximately ten inches of rectum and lower colon and to ascertain if there are any precancerous polyps or suspicious areas within his view. A digital examination would only explore approximately three inches. It is interesting to note that seven out of eight asymptomatic cancers of the colon would remain undetected were it not for this relatively simple test. Only 29% are beyond the range of the sigmoidoscope.

the particular situation. Again, based on the factors involved, a number of different procedures may be selected.

Surgery — In the event that the cancer has taken the form, for example, of a tumor in the lung or breast, surgical removal of the diseased organ may, if metastasis (spread) to other areas in the body has not taken place, effect a cure. Surgical treatment is also used in the case of some malignancies of the skin, larynx, and in some forms of disease where amputation of a limb may be performed to prevent spread of disease.

Cancer located in the bowel and rectum can also be surgically removed. These operations may utilize a technique which provides an artificial skin opening in the abdomen to take the place of the



Dr. John W. Braasch (Center), Chairman of the Department of General Surgery, and a Lahey surgical team in action. Over 550 surgical procedures for cancer are performed yearly.

Treatment

Once the diagnosis of cancer has been made, and the particular form of the disease, its location and the current stage of its development determined, the physician must then make a judgment as to the proper form of treatment to suit

removed segments of bowel tissue. This procedure is called a colostomy, and the opening formed is called a stoma. The Deaconess Hospital provides patients who have had this operation with excellent rehabilitative and instructional service through a special Stoma Clinic.

Although often a radical step, surgery is at the same time perhaps the only way a particular cancer can best be eliminated. *TREATMENT continued page 4...*

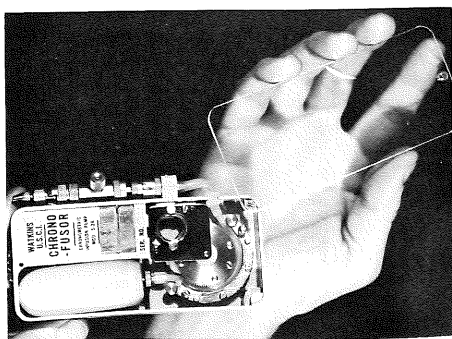
TREATMENT from page 3

Chemotherapy – Within recent years, great strides have been made in the field of chemotherapy, in which powerful medicines and drugs are used to eliminate the cancer or retard its growth. Certain forms of leukemia (cancer of the blood), primary cancer of the liver and breast cancer, at some stages, respond well to this procedure. Currently, Dr. Richard A. Oberfield is studying the effect of new drugs in collaboration with the Eastern Oncology Group which collects data from a variety of medical centers in regard to dosages and response among cancer patients treated.

In the early 1960's, Dr. Elton Watkins, currently Chairman of the Division of Research, invented a small mechanical pump called a "Chronofusor." No larger than a pocket transistor radio, this portable device holds a plastic container filled with an anticancer drug. Once wound up, a small roller pump produces a steady drip of the drug into a catheter (narrow tube) leading to an artery which supplies blood to a diseased organ. Cancer cells multiply at varying rates, depending on the type of cell, and the best time to stop their growth is to "catch" them between reproductive cycles. Since the



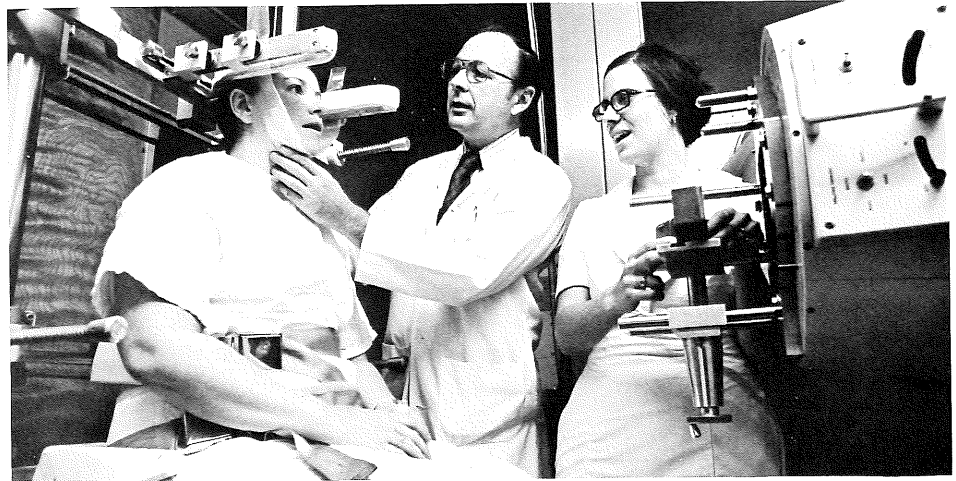
*Patient Wears Pump
For Ambulatory Treatment*



Miniature Cancer Pump

Chronofusor continuously pumps a stream of the drug into the system, there is literally no time when the cancer cell can attempt division successfully as the drug is always present. The Lahey cancer pump has been used with considerable success in treating patients with cancer of the liver and head and neck tumors. At present there are 1400 pumps in use throughout the world.

Radiotherapy – Certain forms of cancer may be treated particularly successfully through the use of extremely high voltage x-ray applied directly to the tumor site. This procedure, known as radiotherapy, has achieved a high degree of development at Lahey Clinic through the long and close relationship Lahey has maintained with Massachusetts Institute of Technology, more particularly, Dr. John G. Trump, current Chairman of Lahey's Trustees, professor of electrical engineering, and Director of the High Voltage Laboratory at M.I.T. Working closely with Dr. Robert Van de Graff in the development of high-powered x-ray machines, Dr. Trump's laboratory, through its Lahey radiation therapy staff, is able to treat hundreds of patients each week suffering from cancers of the prostate, breast, or skin. The Clinic has developed a particular expertise in treating mycosis fungoides, a relatively rare but lethal form of skin cancer.



Dr. Ferdinand A. Salzman, Chairman of the Department of Radiotherapy, positions patient in chair for treatment. Over 300 cancer patients receive this high voltage therapy each year.

Endocrinology – Research has demonstrated that, in certain instances, hormones may be applied to arrest cancer. There is much yet to be learned about the reasons for the reactions

produced and the potential value of such treatment. Lahey endocrinologists, who also serve as members of the Multi-disciplined Breast Cancer Clinic, play an important role in the utilization of this treatment modality. The Breast Clinic, incidentally, is an excellent example of the bringing to bear of a variety of Clinic specialists to an individual patient's particular problem. Through the Clinic, endocrinologist is joined by chemotherapist, surgeon and radiotherapist in order to define the proper treatment to be provided for the breast cancer patient. Often, a sequence of different treatment methods is carefully designed to fit the particular patient's needs.

Although significant studies are being made in the cancer field, the disease still remains one of the most difficult to treat. There is often a deep emotional involvement present on the part of the patient's family, to say nothing of the patient

himself. In situations where this aspect needs special attention, psychiatry can be most useful in providing a rationale to help cope with the disease and its affect on the lifestyle of the patient and family.



BREAST CLINIC MEETS – Discussing an individual's case are (L-R): Dr. Richard A. Oberfield, Chemotherapy; Dr. Artemis G. Pazianos, Endocrinology; Dr. Ferdinand A. Salzman, Radiotherapy; and Dr. Blake Cady, Surgery.

Research

Extensive clinical experience in treatment of cancer at the Lahey Clinic Foundation is complemented by an active laboratory research program. The laboratory effort reflects the recent trend in cancer research toward studies of body immunity to cancer and the effectiveness of new cancer drug combinations.

In the Sias Surgical Laboratory at the Chelsea Naval Hospital, Drs. Elton Watkins and Bruce Gray are studying ways of accentuating the ineffective body immunity to established cancers by means of chemical treatments which alter the structure of the surface of a cancer cell. They have developed a method for test tube study of a patient's immune reaction to his own cancer cells after they have been chemically altered to stimulate more reactivity. The studies are directed at development of a new method for treating cancer by immunological methods and is also providing interesting avenues for organ transplantation research.

At the Sias Medical Research Laboratory at the Brooks Hospital, William A. Curby is continuing his studies of the electronic microparticle counter which can be used to detect infectious bacteria in patients with cancer. The electronic device shows promise in the counting of cancer cells in laboratory experiments. Doctor Victor Rosenoer is working with Curby studying cancerous tumors in experimental animals. They have developed a way of measuring growth rates of cancers by a radioactive isotope method. The aim of this research is the development of a more sensitive way to determine the response of human cancers to various new treatments or drugs in the test tube. Such a method would be invaluable in laboratory development of any of the newer forms of treatment.

Doctor John Collier is continuing his research program in which he has developed a new method for radioactivity detection of carcinoembryonic antigen. This serum protein substance is abnormally increased in many patients with cancer and may prove useful in diagnosis and management of patients with cancer. Also a frozen blood bank is maintained in the Sias Medical Research Laboratory. The Clinic Hematology Service led by Dr. John Norcross is storing blood transfusions drawn during treatment of patients with excess red cell production or polycythemia. The blood transfusions will be given back to the patients when they subsequently develop leukemia as so many of them do.

Doctors Barbara Rosen and David Steinberg are conducting studies in leukemia patients using the drug protocols of the Acute Leukemia Group B Cooperative Study Group. Doctor Blake Cady is studying the immune capacity of



(L-R) Effie Hudson, Belva Wallace and Marion Sclarappa, Tumor Registry

patients with breast cancer or skin melanoma by means of a battery of immunity tests.

The growing number of cancer research programs at the Lahey Clinic Foundation reflects the 1971 decision of the Trustees' Research Committee that priority would be given to institutional support of research programs involved with new and innovative forms of cancer treatment. This support is supplemented by a number of grants from the National Cancer Institute and the American Cancer Society.

Education

From its earliest days Lahey Clinic has encouraged members of its Staff to not only keep up with advances in the special fields of medicine and surgery by attending professional education seminars and courses, but also by participating themselves as lecturers and teachers, reporting the results of their patient care programs. Staff activity in this regard continues to this day as physicians constantly travel locally and nationally learning, teaching, listening, speaking.

Through the quarterly Lahey Clinic Foundation Bulletin, 7,000 members of the medical profession, including physicians, medical schools and hospitals, are informed in regard to new findings in research and cancer treatment. The Clinic Editorial Department and the Medical Art and Photography Departments provide support for the physician whether he is writing a paper for a journal, writing a book or speaking before a professional society.

Lahey colon and rectal surgeons have produced a series of color slides currently being marketed by Medcom, a New York medical audiovisual producer, for distribution to physicians wishing to understand more of the intricacies of the pathology of cancer in that particular field. The Breast Clinic physicians mentioned earlier, produced, with the help of the Medical Art Department and Concept Industries, Inc. (Framingham), an award-winning exhibit, outlining

through tables, colored photographs and charts, the workings of that special group. The exhibit has been accepted for educational display at the annual meeting of both the Vermont-New Hampshire Medical Society in Portsmouth, N.H. and the Massachusetts Medical Society in Boston in succeeding weeks in May.

Periodically, Staff physicians provide patient information lectures of a public nature at the Clinic where preventative measures such as stopping smoking and recognition of cancer's seven signals are stressed. Women patients are regularly instructed in the proper method of breast self-examination through the audiovisual cassette previously mentioned used by the nursing staff under Dr. Blake Cady's direction.

Since 1968, a Cancer Tumor Registry has been maintained at the Clinic. Under the direction of Mrs. Elizabeth Capozzoli, Belva Wallace, Marion Sclarappa, and Effie Hudson have compiled a large amount of statistical data on types of cancer cases seen at the Clinic, treatment employed and response. This information represents an invaluable research tool and, in addition, makes possible periodic follow-up of patients, and thus, a current status file. In March of 1974, Dr. Andrew Mayer, Assistant Director for Professional Activities (cancer), of the American College of Surgeons, granted continuing approval to the Lahey Clinic Cancer program and referred to the registry as a "gold star model."

It would be fair to say that there is virtually no one at Lahey Clinic who is not in some way involved either directly or indirectly in the support of the Lahey effort in cancer. Physicians, secretaries, laboratory and x-ray technicians, researchers, file clerks, appointment secretaries all, and many more combine to carry the Lahey Program forward for the benefit of cancer patients who come to the Clinic seeking help and hope.

Reach to Recovery

by Eve Aptheker, Brooks Hospital

Reach to Recovery is a rehabilitation program geared toward women who have undergone a mastectomy. Its purpose is to aid women in coping with the emotional and physical problems that might occur after a mastectomy. The program was founded by Terese Lasser in the 1950's and became incorporated with the American Cancer Society in 1969. The program was approved for the state of Massachusetts in 1972.

There is absolutely no charge to a woman who wishes to see a Reach to Recovery volunteer. Volunteers are women who have undergone a mastectomy and completed a training program given by the American Cancer Society. **REACH TO RECOVERY** page 6...