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## CANCER— Waging Battle Against America's No. 2 Killer



**THROUGH THE EYES OF A SURGEON**—Despite two decades of progress in cancer drug research, most cancer victims find their best hope is still in the watchful eyes and steady hands of the surgeon. Here Dr. Glenn Young Jr., professor of general and thoracic surgery, operates on a patient with massive cancer of the esophagus. (Photo by Jimmy Wallace)

This year 15,000 people in North Carolina will find out that they have cancer. Only one-third of them will be alive five years from now.

Across the nation, cancer is our No. 2 scourge, eventually killing one of every seven persons.

Recently the federal government launched a major drive to try to change these statistics through intensified research and clinical trials. Duke is one of 11 regional centers throughout the nation designed by the National Cancer Institute to lead in this drive.

The goal of the centers include disseminating the latest information on cancer treatment to physicians in the region and providing a hub for a sweeping cancer screening program, a cancer surveillance system and a rehabilitation program.

But perhaps the most important task of the centers is research, for the basic weapons in the cancer fight are still lacking—knowledge of what causes cancer and what will cure it.

"The real need is for a lot more basic information," said Dr. Wolfgang Joklik, chairman of the Department of Microbiology and Immunology. "The idea is prevalent that there is a great deal of information in the ivory towers that is not being used—that we could cure cancer if we would just get together all this esoteric information and put it to practical use.

"Unfortunately, that's just not so," he said.

Today there are four basic approaches to the treatment of cancer. They are surgery and radiation and the two newest approaches, chemotherapy and immunotherapy. The latter two involve the use of drugs either to kill a tumor or to stimulate the body's own defense against a tumor.

But despite the progress in drug research in the past 20 years, the primary treatment for most of the 100 different diseases called cancer is still surgery or radiation.

There are two stages of tumors for which surgery is the primary treatment.

*America has assigned a top priority to the conquest of cancer. The National Cancer Institute has chosen Duke as the site for a Comprehensive Cancer Center, one of the regional facilities that will lead the all-out effort to conquer this disease.*

*This is the first in a series of four articles by Miss Yvonne Baskin, medical writer in the Office of Public Relations, exploring the status of cancer research and treatment, with particular emphasis on work under way at Duke. This article deals with surgery and therapeutic radiology. Subsequent articles will examine chemotherapy, immunotherapy and research with viruses.*

Stage 1 is when the cancer is still confined to the site of origin. Stage 2 is when the cancer has spread only to the nearest lymph glands.

"If there is any evidence the tumor has gone beyond that point, the tumor is no longer operable," said Dr. William W. Shingleton, director of Duke's Comprehensive Cancer Center and chief of the division of general surgery.

Using breast cancer as an example, Shingleton said 65 to 70 per cent of the women operated on for Stage 1 breast tumors survive for at least five years. This can't be called a real cure, however, since the cancer could recur 10 or 15 years later.

If the cancer has spread from the breast to the lymph nodes under the arms, Shingleton said, the five-year survival rate after surgery is cut to 35 to 40 per cent.

Patients with tumors in the body cavities, such as stomach and lung cancers, have an even lower survival rate because these tumors are often not detected until they have reached the nearly inoperable stage. The five-year survival rate for patients who undergo surgery for lung cancer is only 5 to 10 per cent.

Approximately half of all cancer patients undergo radiation, either in hopes of a cure or for relief of some of the suffering that accompanies cancer. Often the radiation treatment is in combination with surgery.

One problem with radiation treatment has been that the most commonly used types of radiation—x-rays, gamma rays, electron beams—cannot produce the desired chemical changes and kill the cancer cells unless the cells contain a sufficient amount of oxygen. Tumor cells often do not contain much oxygen.

"There are many people who are treatment failures because the radiation did not kill all of the cancer cells," said Dr. Patrick Cavanaugh, chief of therapeutic radiology. "The radiation therapist used the maximum amount of radiation which the normal tissue around the tumor could tolerate, but the cancer cells didn't have enough oxygen for the

(Continued on page 3)

## Neutron Therapy Becoming Available

Neutron therapy, a promising form of treatment for some cancerous tumors, will become available for use this month by physicians at Duke and two other North Carolina medical institutions.

The treatments will be the first available in the eastern United States, and the program will be only the second if its kind in the country.

Administered at the Naval Research Laboratory cyclotron in Washington, D.C., the treatments will be coordinated in this state through Duke, the University of North Carolina at Chapel Hill and North Carolina Baptist Hospital in Winston-Salem.

Dr. Patrick Cavanaugh, chief of therapeutic radiology at Duke, was

among those primarily responsible for getting the program started.

The therapy, which also will be available for use by physicians in six other eastern states and the District of Columbia, utilizes a type of radiation called fast neutron beams created by a cyclotron to irradiate and destroy cancerous tissue much as X-rays and gamma rays are currently used for such treatments.

Previous studies have shown that neutron radiation is significantly better than other types of radiation in controlling or destroying some types of localized tumors.

Funds totaling more than \$1 million from the National Cancer Institute are

supporting the extensive research and clinical studies. In the first year more than 200 patients may receive treatments at the cyclotron.

To carry out the program, therapeutic radiologists, biologists and physicists at several universities, laboratories and hospitals including Duke have formed a cooperative organization called MANTA—the Middle Atlantic Neutron Therapy Association.

Cavanaugh, who is a member of MANTA, said that a Duke physics graduate, Richard Theus, is one of those mainly involved in operating the Naval Research Laboratory cyclotron.