

Clinical Center Observes 20th Anniversary 1953-1973

Control of Hepatitis In Posttransfusion Is Goal of Research

Significant advances have been made in the control of posttransfusion hepatitis. A number of these advances can be traced to Clinical Center research.

In 1964, an antigen—Australia antigen—was discovered in leukemia patients by Blood Bank researcher Dr. Harvey Alter and National Cancer Institute investigator Dr. Baruch Blumberg. Later, Dr. Blumberg, who was then working in Philadelphia, linked the antigen with hepatitis.

Subsequently Blood Bank assistant chief Dr. Paul Holland working with other researchers in the Blood Bank, NIAID, and Bureau of Biologics, FDA (formerly DBS), demonstrated that transfused blood containing the antigen often results in hepatitis.

These studies were the foundation for the current FDA ruling that every blood unit be tested for the antigen—now called hepatitis B antigen or HBAG—before transfusion.

The research also developed a rhesus monkey animal model for hepatitis B infection, demonstrated the importance of the antigen's subtypes, and showed that commercially obtained blood, even from HBAG negative donors, carries a high hepatitis risk.

These CC studies have resulted in a greater than 80 percent decrease in posttransfusion hepatitis.



Dr. Thomas C. Chalmers has been NIH associate director for Clinical Care and Director of the Clinical Center since Feb. 9, 1970. Former CC Directors included Dr. Jack Masur who served while the hospital was planned and constructed and again from 1956 until his death in 1969; Dr. Donald W. Patrick, 1954 to 1956, and Dr. John A. Trautman, 1951 to 1954.

Facilities Enlarged, Programs Expanded, Patients Increased Since CC's 1st Birthday



Those were the days when the campus had about 10 permanent buildings, including Top Cottage, which was moved from its site to make way for the CC under construction in the background.

This year, the Clinical Center is celebrating its 20th anniversary. On July 6, 1953, the first patient was admitted and a new era in NIH intramural research began.

Before the CC was established, research was limited to arrangements made with other institutions in this area or conducted in the field.

As medical research mushroomed during World War II, these methods hampered expanding Institute programs. By the end of the War, an NIH clinical research facility became essential.

PHS Authorizes Hospital

The 1944 Public Health Service Act authorized a research hospital at NIH. In 1947 the first funds were appropriated, and construction started in 1948.

The cornerstone was laid by President Truman in 1951, and the completed 516-bed hospital was dedicated in 1953 by HEW Secretary Oveta Culp Hobby.

During the first year, six Institutes admitted patients: NCI, NHLI, NIAID, NIAMDD, NIMH, and NINDS, but only 161 beds were taken. By 1957, all 516 beds were in use.

Last year, nine Institutes had intramural clinical programs and over 4,500 patients were admitted—a 20-year total of nearly 70,000 patients.

By the late 1950's technological advances made the original eight-room surgical suite obsolete. In 1959 the Center's first major addition was begun—a 4-story circular wing to house heart surgery and neurosurgery facilities, and a blood bank.

The new wing was innovative in its design. It incorporated such features as operating rooms free

clinical research at NIH Institutes

of the usual clutter of instruments and wires—most of the equipment and even the technical personnel are in a central area outside the operating rooms—and advanced monitoring systems.

Now, because of the scope of clinical programs, it is again necessary to expand CC facilities.

Plans include a several story addition for patients in the maternal and child health program, and the enlarging of outpatient facilities.

Also, initial planning for a new ambulatory patient care facility is under way.

Pharmacy First to Develop Central IV Additive Service

The CC Pharmacy Department was one of the Nation's first to develop a centralized intravenous additive admixture service whereby drugs are added to IV solutions in the pharmacy instead of in nursing units.

By using laminar air flow hoods and sterile techniques to prevent bacterial contamination, this program became a model for other hospitals.

Since its inception in late 1964, the service has trained hundreds of pharmacists in intravenous additive procedures and has been a leader in publishing drug incompatibility data.

NIH Investigations in CC Lead to Knowledge, Cure of Some Diseases

Research by NIH scientists working at the Clinical Center has contributed knowledge leading to discoveries which have changed the approach to major diseases. NIH investigators have developed innovations in fields that include:

Cancer. The first successful cure of a solid tumor with cancer drugs. Choriocarcinoma, a rare cancer of the uterus following pregnancy, is now almost entirely curable if detected in the early stages.

Hodgkin's disease, a cancer of the lymph system, may now be checked in the early stages with massive doses of radiation therapy.

Improved survival of patients with leukemia results from treatment with combinations of cancer drugs and therapy, including platelet transfusion and nearly germ-free laminar air flow rooms.

Heart and blood diseases. Methods of diagnosing cardiac defects include transeptal catheterization of the left part of the heart and Krypton 85 techniques.

Other studies of CC patients with heart disorders have enabled scientists to better understand diseases like subaortic stenosis.

Investigators have developed methods of measuring blood lipids and have developed diets and drugs to control the formation and/or accumulation of blood lipids.

Another finding is the drug Alpha Methyl dopa for hypertension, or high blood pressure.

Eye diseases. Uveitis, a disease sometimes leading to blindness, yielded to treatment with immunosuppressive drugs, and toxoplasmosis was also successfully treated. Basic information about cataracts and its relationship between this disease and exposure to excess radiation and steroids was established.

Dental disorders. Diseases of the dental pulp were described for the first time, and the infectious nature of dental caries was also established.

Human reproduction. Studies of the hormonal changes during the normal menstrual cycle divulged basic information that enables many women to have children and also to assist in the early diagnosis of pregnancy.

Metabolic diseases. Research on the biochemistry of gout helped to bring a once painful, crippling ill-

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CC—Provides Advanced Patient Care Services for Clinical Research

The Clinical Center's main function is to provide the advanced patient care services necessary to facilitate clinical research. During the past 20 years, procedures and techniques have evolved that have helped reshape medical care throughout the Nation.

A broad range of activity extends from sophisticated social and recreational services essential to patients participating in medical research to the highly technical disciplines of biochemistry or nuclear medicine.



Round surgical suites for heart and brain surgery are designed to keep floors and space free of wires and equipment that might hamper movement of personnel.



Autoanalyzers test samples of body fluids for constituents, increasing accuracy and shortening the time required. Analyzers detect and measure blood lipids that may accumulate and contribute to heart disease.



Health standards necessary for clinical research also benefit NIH'ers. Highly skilled cardiac arrest teams are on call for employees, an advanced alcoholism treatment and rehabilitation program is available, and employees may participate in cold and cholesterol studies in addition to receiving first aid from the Employee Health Service.



An automated system developed last year to perform chemical analyses of small amounts of body fluids from children is already being expanded to include immunoglobulin tests.



Wall panels contain all equipment for surveillance of individual patients in the newest intensive care units. Each unit has its own power source and suction equipment.



In metabolic kitchens, foods are precisely weighed and prepared, and the exact content of patient food is recorded.



Test tube cells are cultured in air containing varying amounts of anesthetics to determine how drugs affect immunity.



CC nurses are a patient's primary contact with hospital staff. In addition to performing advanced patient care related to research, nurses devote time and personal attention to patients as individuals.



The Spiritual Ministry Department provides religious services for patients and employees.



Laminar air flow rooms, developed by the Nursing Department in cooperation with the National Cancer Institute, protect patients unusually susceptible to infection. Ultra clean air flows into the patient's portion of the room, is swept away, and recleaned before flowing back. Patients are observed and treatment is administered through a protective plastic shield. All materials entering patient areas are sterile—even food.

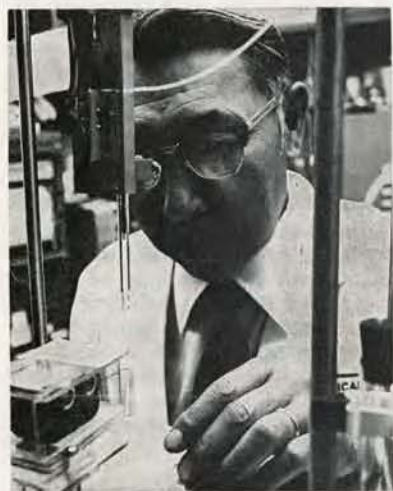


In the Nuclear Medicine Department, gamma cameras are used for brain scans. Abnormalities in the flow of isotopes through the blood stream are recorded and can aid in diagnosing brain disease.

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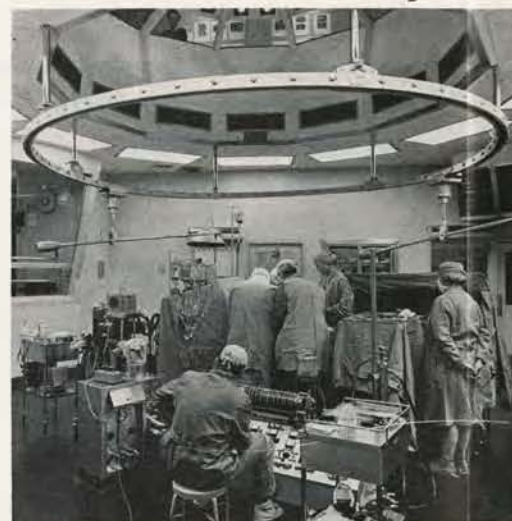
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Computers Assist Busy Physicians by Reporting Laboratory Test Results



Sandy Romberger, a Microbiology Service medical technologist, reads results of tests to determine the antibiotic sensitivity of bacteria and enters data into the computer.

Computerized methods of recording and reporting results of microbiological tests are being investigated at the Clinical Center.

This work represents the culmination of years of research at the Clinical Pathology Department. The department has led the Nation in laboratory computerization, in 1965 it initiated the use of computers to manipulate laboratory data and report test results.

Computerization eliminates the need to record laboratory test results by hand, thereby reducing the chance of error. It also provides a facility for storing test results.

Now, nearly 80 percent of the department's laboratory tests are recorded and reported to physicians by computer. Other lab studies using computers are also underway.

Serial Casts and Splints to Relieve Pain in Joints First Introduced by CC's Rehabilitation Department

Serial casts—a series of progressively straightened casts—and splints relieve joint pain caused by severe arthritis, and correct joint deformities. Now, formerly disabled patients may lead more normal lives. Sixteen years ago, this form of rehabilitation was relatively unknown here.

The use of casts and splints to treat diseases of the joints was first introduced by the CC Rehabilitation Department at the suggestion of an NIH Visiting Scientist, Dr. J. Kellgren, who was familiar with this technique used in Europe.

By supporting or immobilizing affected joints, splints help relieve pain and reduce inflammation due to stress, and help patients to regain normal function.

Rehabilitation Department chief Dr. David Fried and Mario Slavannelli, chief of the department's Physical Therapy Service, worked with commercial firms to develop a new thermoplastic material which lasts longer than plaster of Paris.

INVESTIGATIONS

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ness under control with medication.

Studies of protein loss through the gastrointestinal tract have led to advances in clinical disorders of protein metabolism. An early diagnostic test for protein-losing enteropathy was developed.

Brain research. The nature of the mechanism that prevents foreign materials from entering the brain through the bloodstream has been partially explained; consequently cancer drugs that bypass the barrier were evolved.

A cerebral intraventricular reservoir for administration of drugs was developed. New methods for diagnosing diseases of the brain include radioisotope cisternography and ventriculography.

Hepatitis. The discovery of the Australia antigen in blood of patients with leukemia led to its association with hepatitis. Subsequently methods were developed for screening blood donors to prevent transmission of this liver disease during blood transfusion.

Enzymatic defects. A variety of diseases including Lesch-Nyhan, Gaucher's, and Neimann-Pick's syndrome, galactosemia, and Fabry's and Tay-Sach's diseases have been traced to enzymatic defects.

In several instances treatments have resulted; in others, diagnostic techniques have been simplified and some diseases may now be diagnosed before birth.

Pathogenesis of disease. Two agents, the Eaton agent as a cause of primary atypical pneumonia and the Norwalk agent as a cause of gastroenteritis, were first elucidated at the Clinical Center.



This young patient had stiff knees which prevented her from walking. Now age 16, she is walking normally. She has been under the care of the CC's Physical Therapy Department. The serial casts and exercise helped straighten the joints. The cast on the extreme left was applied when she was first admitted. The cast on the right and the one on her left leg, applied by Dr. Fried, show progress in straightening the knee. A program on the method is given at hospitals.

TV Proves Important Tool in Diagnosing, Treating Illness; Offers Accurate Record



Mr. Whitehouse adjusts the position of the videodensitometer on the TV screen during a heart catheterization procedure. Closed circuit television is used to determine the ejection fraction of the left ventricle.

Research on the use of television applied to medical studies reveals that this medium may become an important tool in the diagnosis and treatment of illness.

Willard Whitehouse, chief of the CC Television Engineering Section and a pioneer in the medical use of television, explained that videotape in the CC gives a great deal of information about medical procedures that could be used for further studies.

Videotape, he added, is available for review and analysis. It offers a faster and more accurate record of sequential events than conventional methods—still photography or film—which require developing and cannot be viewed immediately.

Currently at the CC, TV is used to help physicians diagnose heart disease, cancer, gastrointestinal disorders, epilepsy, dental abnormalities, and to record brain and heart surgery.

Recently, closed circuit videotape techniques were applied to the study of basic cell processes.

Working with members of NIAID's Laboratory of Parasitic Diseases, the TV unit used methods first developed to measure heart volume to the measurement of the area of vertebrate cells.

The technique requires one hour rather than the several days it required for previous methods such as still photography.

Investigators can quickly see how cells change in area or how heart cells "beat" in response to drugs, temperature, or parasite infection.

At the present time, the largest medical use of television at the CC is in heart catheterization which is a diagnostic procedure.

Two techniques, videoplanimetry and videodensitometry, have been developed and used during the past 7 years to determine the ejection fraction of the left ventricle of the heart.

CC Television Engineering Section

Programs for Nursing And Medical Students Give Firsthand Facts

More than 60 medical students from schools throughout the country have been accepted for the Clinical Center's 1973-74 clinical electives program. Students of nursing have a similar program; participants are now being chosen for courses in the fall.

The programs were started to give outstanding medical and nursing students firsthand experience in a research hospital.

Medical students may select courses in four clinical subspecialties: endocrinology and metabolism, oncology-hematology, immunology, and computers in clinical medicine.

An important part of their CC experience is the close association with clinical associates and physician-scientists in NIH Institutes.

Since 1971 when the program began, 113 students have been accepted. They represent nearly 50 medical schools in over 25 states.

The program for nurses consists of courses in nursing specialties and patient care.

Outpatient Space Is Expanded

An expanded and updated outpatient area is under construction at the Clinical Center.

In 1975, it is expected that as many as 50,000 outpatient visits will be made—in 1971, there were 32,000 visits.

When completed, nine more examination and special treatment rooms will be available.