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-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 Meur who served while the hospital was planned and constructed and again from 1956 until his death in 1969; Dr. Arnold W. Patrick, 1954 to 1956; and Dr. John A. Troutman, 1951 to 1954.

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

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, it 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 1958 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 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.

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 manageable forms 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 transseptal 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 subacute endocarditis.

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 Alpharyl-empa for hypertension, or high blood pressure.

Eye disorders. 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 illness.

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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.

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

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

**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.

**Well 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.

**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.**

**The Central Laboratory** is expanding capabilities to provide routine blood analyses for research.

**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.

**Health standards necessary for clinical research also benefit NIH’sers.** 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.

**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 recirculated before flowing back. Patients are observed and treatment is administered through a protective plastic shield. All materials entering patient areas are sterile—even food.

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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 di-
agnostic 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 bar-
rier were evolved.

A cerebral intraventricular res-

ervoir for administration of drugs was developed. New methods for diagnosing diseases of the brain include radioisotope cisternogra-

phy and ventriculography.

Hepatitis. The discovery of the Australian antigen in blood of pa-

tients with leukemia led to its as-

sociation with hepatitis. Subse-

quently methods were developed for screening blood donors to pre-

vent transmission of this liver dis-

ease during blood transfusion.

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

In several instances treatments have resulted; in others, diagnostic tests have been simplified and some diseases may now be diag-

nosed before birth.

Pathogenesis of disease. Two ag-

ents, 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.

Serial Casts and Splints to Relieve Pain in Joints

First Introduced by CC's Rehabilitation Department

Serial casts—a series of progressively

straitened casts—and splints relieve joint pain caused by severe arthritis, and correct joint deformities. Now, formerly dis-
abled patients may lead more nor-
amal lives. Sixteen years ago, this form of rehabilitation was relatively-

ly unknown here.

The use of casts and splints to treat diseases of the Joints was first introduced by the CC Rehabili-
tation Department at the sugges-
tion of an NIH Visiting Scientist, Dr. J. Keiligren, 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 re-
gain normal function.

Rehabilitation Department chief Dr. David Fried and Mario Shava-
nelli, 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.

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 straight-

ening the knee. A program on the

method is given at hospitals.

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 Therapists Department and a pioneer in the clinical use of television, reports that the closed circuit video-
tape in the CC gives a great deal of information about medical pro-
cedures 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 pho-

tography 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 video-
techniques were applied to the study of basic cell processes.

Working with members of NIA-
ID's Laboratory of Parasitic Dis-

eases, 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 re-
quired 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 in-
fection.

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 coun-
try 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 nurs-
ing students firsthand experience in a research hospital.

Medical students may select courses in four clinical subspecial-
ities: endocrinology and metabol-
ism, oncology-hematology, immuno-

ology, and computers in clinical medicine.

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

Since 1971 when the program began, 115 students have been ac-
cepted. They represent nearly 60 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 outpa-
tient 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 ex-
amination and special treatment rooms will be available.