When the National Institutes of Health awarded Duke’s Department of Medicine a myocardial infarction research unit grant in 1967, one of the first things purchased by department chair Eugene Stead, MD, was a computer. He placed the computer in the department’s cardiac care unit (CCU) to monitor heart patients.

This was done during the early stages of modern cardiology, shortly after the first research paper on cardiopulmonary resuscitation, or CPR, was published. Stead knew that, someday, computers would become an invaluable part of patient care. He believed that relying on people’s limited memories was one of the greatest weaknesses of clinical practice. Thus, he developed a database of patient characteristics, diagnoses, treatments, and outcomes that were stored in a computer’s robust memory and were easily accessible to physicians who wanted to study long-term data about how patients responded to treatment.

This growing database became a resource for information storage and retrieval within the Department of Medicine’s division of cardiology, tracking specific patient characteristics through the CCU and the cardiac catheterization laboratory. Over time, features were developed to expand its ability to use statistical methods to analyze follow-up data. Additional upgrades allowed for the inclusion of inter-institutional databases, and formulas were developed to examine more closely the cost effectiveness of diagnostics and treatment strategies for heart disease.

In a few short years, the Duke Databank for Cardiovascular Disease (DDCD) became a research tool that would change the practice of medicine, with numerous researchers mining its stores to test dozens of hypotheses. Today, it is the oldest and largest compilation of data on heart care outcomes, with comprehensive, long-term records on more than 200,000 people.

Maintaining and adding to the DDCD eventually provided numerous physicians, biostatisticians, and data managers with the chance to build their expertise in the collection, management, and analysis of clinical data. In 1992, this expertise spawned the creation of the Duke Clinical Research Institute (DCRI), the world’s largest academic research organization.

The DCRI now manages massive amounts of data for Phase I to IV clinical trials for drugs and biologics, device trials, post-approval studies, and quality improvement registries, and publishes more than 400 articles per year in peer-reviewed journals. It is also a founding sponsor of the Clinical Data Interchange Standards Consortium, a non-profit organization that sets data standards for clinical research.

A group of Duke physicians worked with IBM programmers to develop a system that allowed them to enter a patient’s medical history, physical exam results, and laboratory data into a computer, which returned a diagnosis and a list of recommended treatments. That experimental system, however, failed to recognize many common diseases and was not implemented.

Another group of Duke faculty, led by Drs. W. Ed Hammond and Howard Thompson Jr., created a 19-page mark-sense form that patients could complete, computers could process, and physicians could view in narrative form. Dr. William Stead, then a first-year medical student, also created a real-time, interactive headache questionnaire that could identify a patient’s type of headache. This questionnaire’s diagnostic accuracy matched that of a neurologist, and was Duke’s first usable clinical decision support application.
Duke gives Drs. Hammond and Thompson the funding to develop a working prototype of a general purpose electronic medical record (EMR). This prototype would eventually evolve into The Medical Record, one of the first EMRs in the United States.

Duke implements a third-party health information system from Burroughs Corporation for patient admission, discharge, and transfer data, as well as for order entry and results reporting among all intermediate care nursing stations and major ancillary departments.

Duke partners with IBM to build the Duke Hospital Information System, which was also marketed by IBM as the Patient Care System.

Dr. Stead, by then director of Duke’s Department of Medical Center Information Systems, secures a grant from the National Library of Medicine to develop and implement an Integrated Academic Information Management System at Duke.