

veloped to maintain the quality of medical care needed for the rapidly increasing mass of human beings.

In routine physical examinations and in the diagnosis and treatment of heart disease, physicians in the United States spend part of their scarce time analyzing some 50 million electrocardiograms per year, for example, as one of the things they have to do.

These tests and many more can now be done on a mass scale—quickly, reliably, and inexpensively—by automated systems using computers.

Just as automation in a thousand industries has jumped up production while saving time and money and conserving manpower, it can now be used in medical care. To be of greatest effectiveness, automation requires extensive communication facilities.

Automation is a giant step in the battle against heart disease, with its annual mortality in the United States alone of well over 700,000—against stroke, with an annual mortality of approximately 200,000—against other killer diseases of the cardiovascular and cardiopulmonary systems.

The growing number of physical and laboratory tests required by our increasing and aging population, the shortage of physicians and other health personnel, and our awareness of the need for raising the quality of medical practice for all our citizens, force us to utilize the precision and rapidity of computers and communications systems. These systems can be tools in medical practice to help us keep up and not fall behind in our vital battle to preserve the health of our people.

Delegation of routine duties to automated systems is an ideal way in which the physician can find more time for development and exercise of higher professional skills and to provide leadership to the medical teams required in today's concept of comprehensive health care.

Since a computer system can increase the effective use of the physician's time, he can concentrate more on his needs for further education to maintain awareness of day-by-day scientific advances.

The computer can, for example, relieve the heart station physician, the industrial physician, and the physician in group or hospital practice, of the tedium of reviewing predominantly normal electrocardiograms. The physician-time thus saved can be reflected in better care of patients.

The digital computer in this way can help solve today's problem of the shortage of medical manpower.

To make this major advance, research and demonstrations have been conducted the past several years in the use of computers and modern electronic systems to interpret electrocardiograms and other medical signals.

System Development

Several steps were necessary to develop a functional system. First, a new electronic instrument was engineered to take an electrocardiogram. The unit, which can be operated by any EKG technician, is called a data acquisition console. Slide No. 1 shows an example of this.

(The illustration referred to follows:)