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USE OF INFORMATION TECHNOLOGY IN HOSPITALS

Statement of
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Before the
Subcommittee on Education and Health
Joint Economic Committee

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Mr. Chairman and Members of the Subcommittee:

GAO is pleased to be able to participate in these hearings on the future of health care in America. Recognizing the primary purpose of today's hearings--to explore the current and future role of automation in hospitals--I would like to share the results of our efforts in examining information systems in federal and non-federal hospitals. We have also identified some areas the Subcommittee may wish to explore as it continues its deliberations on this topic.

As you are well aware, the cost of medical care as a percentage of the nation's gross national product doubled from 1960 to 1985 to nearly 11 percent and continues to climb. The application of computer technology offers the potential to improve medical care while helping contain its costs. The Veterans Administration (VA) and Department of Defense have major efforts underway to define, develop, and deploy integrated hospital information systems--one aspect of computer technology. These efforts are on the forefront of the development of a new generation of hospital information systems--systems that possess a comprehensiveness that has not existed before.

My testimony describes the VA and Defense efforts and the significance of these efforts to the use of information technology in health care and hospital management. In

addition, I will provide information from our limited survey of hospital information systems in non-federal hospitals. We did this survey to identify the scope of hospital information systems in the private sector to serve as a point of comparison for our examination of the VA and Defense efforts.

Integrated Hospital Information Systems

An integrated hospital information system is a computer system that receives information from hospital departments, processes it, and maintains medical and financial records about each patient. For example, through an integrated information system, a physician may enter orders for laboratory tests for a patient. The system may then schedule the test, directly receive the results from laboratory test equipment, forward the results to the nursing unit, and allow the physician to review the results in his office as soon as the test is complete. This information is then stored in the system for future analysis along with other test results.

VA and Defense Integrated Hospital Information Systems

VA began installing its computer system, the Decentralized Hospital Computer System, to support 172 hospitals and 358

other health care facilities in 1983. During 1986, these facilities served over 1 million inpatient hospitalizations and 18 million outpatient visits, and conducted 183 million laboratory procedures. VA estimates that its system will cost $925 million as currently defined. Its approach has been to use its own medical professionals to define its needs and its own computer professionals to develop its system. VA has installed an initial increment of software and plans to install additional and enhanced software modules and hardware incrementally.

The Department of Defense is also acquiring its own system, the Composite Health Care System, for installation in its approximately 167 hospitals and nearly 600 clinics worldwide. During 1986, these facilities served nearly 1 million inpatient hospitalizations and 48 million outpatient visits. Defense estimates that this program will cost between $800 million and $1.1 billion. It identified its detailed information needs itself and then evaluated prototypes from three vendors before selecting one vendor in February 1988. This vendor will complete development of the system and install it in 10 hospitals for an extended operational test and evaluation prior to Defense making a deployment decision late next year.

VA and Defense efforts to identify their information needs have been extensive. Both agencies tested and evaluated commercial products to assess whether the commercial products could satisfy their information needs. They concluded that individually developed systems were needed because off-the-shelf commercial systems did not provide the comprehensive functionality desired. We have found that the systems being developed by VA and Defense support a more comprehensive set of functions than those we examined during our survey of non-federal hospital information systems.

These federal efforts represent a large national investment in medical information systems. When completed, nearly 350 hospitals and more than 600 clinics will be fitted with state-of-the-art computers and software, forming the largest group of facilities operating systems to support medical care and the management of medical operations. Links between the VA and Defense systems are being designed as VA hospitals need to be able to handle military casualties in wartime.

Parts of the VA and Defense systems have been installed and are currently in use. As part of our examination of these two systems, we talked to a number of users. Their comments were generally favorable.

Users of VA's system told us that the system allowed staff on the hospital wards to access a patient's laboratory test results as soon as the technician entered them into the data base. This reduced the number of phone calls for laboratory results and decreased the number of duplicate tests or lost results. Physicians told us that the ready access to laboratory results led to more timely diagnoses and better patient care. The pharmacy staff said that improved access to patients' current medication profiles allowed patients to receive their outpatient prescriptions quickly.

Users of the Defense system at its current test hospital have also identified benefits from the system. For example, physicians believe that the overall quality of care has been improved because they can review displays and graph the history of a patient's laboratory results or medication records--that they have personally ordered--instantaneously, rather than sorting through stacks of forms. Pharmacists said the system has made the distribution of outpatient prescriptions more efficient because a clinic doctor can order a prescription while the patient is in the office. The system will print a label and enter the prescription in the patient's computerized record and in a pharmacy report. By the time the patient arrives at the pharmacy, the prescription has been filled.

Further, both the VA and Defense systems are being designed to have automatic alerts to determine drug interaction and abnormal lab results, and to supply information for peer review processes.

While both system development efforts are 2 years away from completion, at this time we see no insurmountable technical barriers to prevent the successful completion and implementation of these systems.

Commercial Integrated Hospital Information Systems

We also conducted a comprehensive literature search on the commercial hospital information system industry and a limited study of successful implementations of commercial systems to aid us in evaluating the scope of VA and Defense efforts. We contacted the seven largest vendors--those which reportedly controlled 65 percent of 1984 sales--to examine their most comprehensive systems. We also examined these systems at seven hospitals the vendors selected as their most successful, comprehensive installations. We found these systems were not developed to provide the degree of comprehensiveness planned for the VA and Defense systems.

We identified several factors cited in literature that may have affected the development of commercial hospital information systems.

-- A small market for these systems. Some experts believe that hospitals need to have 200 or more operating beds to make optimal use of integrated hospital information systems. Of the 5,700 community hospitals, nearly 4,000, or 70 percent, have less than 200 operating beds.

-- Low levels of spending for automation in the hospital industry. Several surveys reported that hospitals generally invest only 1 to 1 1/2 percent of gross revenues on automation.

-- Historical lack of incentive to minimize costs. The historical lack of price competition or other strong incentive to reduce or contain costs may explain why hospitals have such low levels of investment in automation. (Medicare's Prospective Payment System, introduced in October 1983 and phased in over 4 years, has raised the cost-consciousness of hospitals.) In addition, it may be difficult for many hospitals to raise funds for information systems that have high initial costs.

-- Savings currently limited to reducing clerical work. Savings from these systems are most likely to accrue from reductions in the time required for medical personnel to perform clerical tasks. Medical professionals spend up to 25 percent of their time performing clerical tasks of which only a fraction can be saved through automation.

-- Difficulty of achieving and quantifying savings. Time savings are fragmented and must be combined or consolidated to reduce the number of personnel or the hours worked. In practice, this is difficult to do and requires a concerted effort that few hospitals are able to sustain.

During our survey of commercial hospital information systems, we asked hospitals to rate the importance of factors in their selection of a system. The hospitals considered comprehensiveness and integration as the most important factor. They also considered reliability, flexibility, strength of the vendor, cost, and implementation support to be important factors.

Benefits of Systems

One factor that may have impeded the commercial development of integrated hospital information systems is the limited evidence to indicate the billions of dollars that hospitals have invested in integrated systems actually result in cost savings. While there are a number of studies that address system costs and prospective benefits, we are not aware of comparable studies that address actual measured costs and benefits.

VA has conducted several cost/benefit analyses to justify its procurement of additional hardware to support its evolving information system. These studies identified prospective benefits--those that VA believes its system can achieve. Congressional direction requires Defense to also estimate the benefits and costs of each phase of its incremental implementation, and to report its findings prior to making a deployment decision scheduled to be made in late 1990. Defense plans to analyze tangible and intangible benefits during the operational test and evaluation phase, which is scheduled to be completed late next year. Over time, when the systems are fully developed, these efforts by VA and Defense to quantify the benefits from their systems should provide information on actual benefits achieved.

In addition to quantifiable benefits, there are many qualitative improvements possible through the use of integrated hospital information systems. These include improvements in patient relations, better information for physicians, improved timeliness of information, reduced opportunity for error, and improved management information.

The projected federal investment of $2 billion in integrated hospital information systems is significant. For this investment, VA and Defense anticipate obtaining a degree of comprehensiveness beyond that currently offered in the commercial marketplace to the nation's 5,700 community hospitals.

Our limited work suggests that a number of commercial firms are capable of developing hospital information systems and that hospitals consider comprehensiveness to be an important factor in choosing a system. However, our work also suggests that the small size of most hospitals and the cost of automation may be impediments to the development of commercial hospital information systems. As I mentioned earlier, the federal effort in just defining and developing the comprehensive VA and Defense systems has been significant--requiring an investment that individual community hospitals may not be able to afford. The federal

investment has been justified largely by the large number of medical facilities in which these systems will be installed.

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Thus far, I have provided information on the current condition, as we know it, of hospital automation as it relates to health care and the management of operations--thus addressing one purpose of today's hearings. Our work to date has not addressed the role of automation in hospitals in the future--the other purpose of today's hearing. From our work, however, we have identified some areas the Subcommittee may wish to explore as it gathers information on health care in the future:

-- What should be the government role, if any, in transferring the federal investment in integrated hospital information systems to community hospitals?

-- What are the potential benefits from using fully automated medical records to greatly reduce the costs of handling paper records?

-- What are the potential benefits from incorporating expert or decision support systems to improve medical diagnoses and treatments?

-- What are the potential benefits from providing an improved, larger, automated data base for research to more rapidly and uniformly introduce refinements and improvements to medical practice?

We recognize these questions are complex and with each question there are a host of issues--technical, legal, medical, and managerial--to be considered in addressing them. We recognize that analyzing these and other issues is a tremendously difficult task and we applaud the Subcommittee for taking the crucial first step of beginning this important dialogue.

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This concludes my prepared statement. I will be glad to answer any questions that you may have at this time.