ARMIS: A Microcomputer-Based Hospital Risk Management Information System

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Information processing is a major element of hospital risk management programs. A microcomputer-based information system has been designed and implemented in a medium-size university hospital. The design principles and the functional capabilities of the system are described here, followed by an evaluation based on the first year of operation.

INTRODUCTION

This article describes a microcomputer-based information system designed to support hospital risk management efforts. The system, referred to as ARMIS (Automated Risk Management Information System), was developed and implemented at a 450-bed tertiary care university medical center in the Midwest.

The article first presents a brief discussion of hospital risk management and its information needs. Then, following an overview of ARMIS, the various functions of the system are described in detail. Finally, the performance of the system during the first year of operation is discussed.

HOSPITAL RISK MANAGEMENT

Risk management in hospitals is the "function of planning, organizing, and directing a comprehensive program of activities to identify, evaluate, and take corrective action against risks that may lead to patient injury, employee injury, and property loss or damage with resulting financial loss."1 Current public interest in the quality of health care and

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the trend toward larger and more frequent claims and lawsuits against health care providers have resulted in the establishment of risk management programs in virtually all hospitals in the United States. Risk management programs have three basic functional components: (a) information collection—gathering data regarding actual and potential financial risks; (b) problem identification—analysis of information to define areas requiring particular attention; (c) management of identified problems—investigation of problems and control of financial risk.

The primary information source is the patient incident report, which is generated by clinical personnel in response to adverse patient incidents and then routed to the hospital risk manager. A patient incident has been defined as "any happening, with or without injury, involving patient mishap or serious expression of dissatisfaction. It is a result of a patient (or patient’s relative, or companion) perceiving, rightly or wrongly, that the patient has in some manner been slighted, neglected, mistreated, or injured."²

Risk management involves three levels of decision making: (1) Screening of incoming incident reports: Does this incident require further investigation? (2) Investigation of incidents: What needs to be done about this incident? (3) Management of problem areas: What needs to be done to control sources of risk to the hospital? The objective of the ARMIS project was to assist in meeting the information needs of hospital risk managers and, therefore, to support risk management decision-making processes.

NEED FOR INFORMATION

A review of hospital risk management program descriptions in the literature reveals that a major portion of risk management effort is devoted to information collection and preliminary data analysis.²⁻⁴ A reasonable hypothesis is that effective automation of these activities would enable a shift in emphasis from data processing to analysis and management. In support of this hypothesis, the literature contains a growing number of references indicating the importance of automation in hospital risk management activities.⁵⁻⁹

One response to the information needs of hospital risk management has been the establishment of centralized data-processing services. Such services provide user hospitals with a series of reports that are tabulations of data abstracted from patient incident reports. Two major problems usually attend the use of these services. First, the response time of these batch-oriented services is long. Reports are typically produced on a monthly or quarterly cycle, which reduces the accuracy and timeliness of the information. Second, the range of available report formats is limited and quite inflexible. These two characteristics combine to limit the responsiveness of the system to the unique information needs of a particular hospital. Such constraints are felt most acutely in situations in which the risk manager needs to make immediate and informed responses to an evolving situation. An additional concern with off-site data-processing services is the possibility that confidential patient and hospital information may be compromised.

The impetus for the ARMIS project came from a recognition that currently available microcomputers offer (a) adequate data-processing performance, (b) reasonable cost, and (c) flexibility and responsiveness in single-user applications. Thus, ARMIS was devel-