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AN ANALYSIS OF PATIENT INCIDENTS AND RELATED VARIABLES IN A LARGE URBAN HOSPITAL

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ABSTRACT

The frequency and distribution of various types of patient incidents at a large urban medical center in Memphis, Tennessee were examined through an analysis of 969 incident reports. Additionally, a comparison of incident patient demographics and treatment patterns was made with a randomly selected control group of 189 non-incident patients residing at the hospital during the same time period. The study revealed that the frequency of patient incidents and the distribution of incidents by type are significantly related to the variables of patient age, diagnostic category, medication type, and number of medications received. Information regarding such relationships can be used to construct predictive models for improving quality of care and controlling risks in hospital settings.

INTRODUCTION

Risks, especially risks to health, safety, and the environment, are receiving increasing attention from policymakers, the public, and the scientific community (Hadden, 1984). There is a growing body of literature on the assessment of risk incidents in public safety (O'Neill et al., 1983); public health (Calkins, 1980; National Research Council, 1983); the workplace (Viscusi, 1983); and hospitals (Kraus, 1986). Increasingly the literature reflects attempts to establish predictive models of risk

behavior. A well known example is the research on automobile accident indicators (Robertson, 1977; O'Neill, et al., 1983). In our study we focus the research specifically on incident behavior in hospitals.

In the hospital setting risks to patient safety and health are usually assessed through incident reporting mechanisms (Brown, 1979). As described by Blake (1984, p. 37), "An incident is any event which is not consistent with the routine operation of the hospital or the routine care of a patient." It may be an accident or some circumstance which causes or potentially could cause bodily injury or property damage. Most hospitals engage in some form of fact finding process that serves to identify the cause of the incident as a requirement of the Joint Commission on Accreditation of Hospitals. However, very little research has been conducted in an effort to analyze these incidents in relation to other variables (Gryzbek, 1979; Swartzbeck and Milligan, 1982) and even less has been done to establish predictive models of incident behavior. In our study we seek to add to this small fund of knowledge and begin the process of developing predictors that may be used in reducing risks to health and safety in the hospital setting.

METHODS

Incident reports kept by a large urban medical center in Memphis, Tennessee were collected for analysis (under hospital regulations, incident report forms must be com-

pleted by hospital personnel after each incident involving a patient). The types of incidents analyzed included patient falls, and errors regarding medication, treatment or procedure. For this study, 969 patient incident forms filed at the hospital during the first quarter of 1983 were examined. In addition, data were collected from the records of 189 non-incident patients at the hospital during the same time period to provide a comparison or control group. With appropriate confidentiality safeguards, the data were transferred into a Sperry Univac 1100 computer. Incident frequencies and types were crosstabulated with a number of patient variables, including those of patient age, sex, race, diagnostic category, medication type and medication level. The Statistical Package for the Social Sciences (SPSS) was used in conducting the analysis.

RESULTS AND DISCUSSION

In general, the variables of patient age, diagnostic status, medication type, and medication level proved to be the most significant predictors of incident status as well as the type of incident occurring. As Figure 1 indicates, the relationship between patient age and incident status is highly positive, with patients 61 years old or older heavily overrepresented with respect to incident involvement. Patients in these age categories represent 36.3% of the hospital population, yet are involved in 55.9% of hospital incidents.

Figure 2 illustrates another important age-related feature: the positive relationship between patient age and patient falls. For patients sixty years of age or younger, the types of incidents that occur are rather varied, with falls

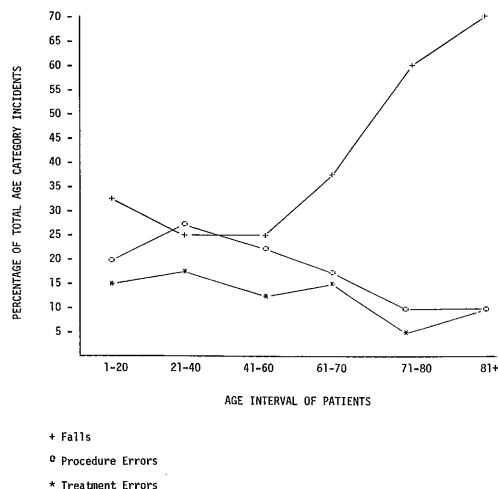


Figure 1. Proportion of patients by age involved in incidents as compared to their proportion of the total patient population.

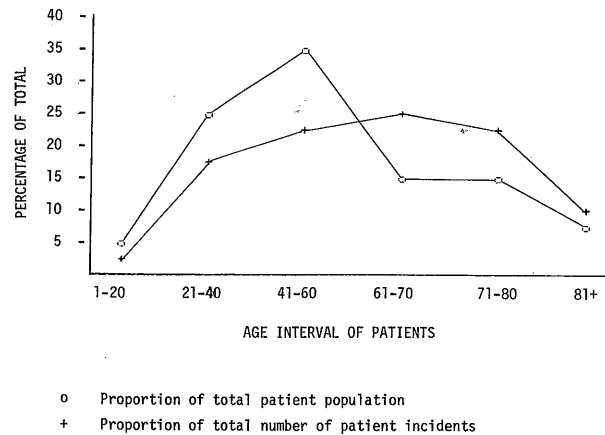


Figure 2. Patient incidents by type and age category (Incident types include falls, medication errors, and procedure error).

only comprising approximately 25% of the total (the remainder being distributed across the procedure, treatment, and "other" categories—the latter not shown in Figure 2). In the 61-70 age category, the proportion of falls rises to 37.3%; from 71-80, 59.4%; and with incident patients over 81 years of age, 69.6% were victims of falls. In some cases, the diagnostic category of a patient is related to incident involvement. Patients suffering from endocrine, nutritional, or metabolic disorders are significantly overrepresented as medication incident patients; they make up 1.6% of the hospital population, yet are involved in 8.8% of the medication incidents. Nervous disorder patients are disproportionately likely to become involved in virtually all types of incidents (4.9% of the patient population, 9.3% of the total number of incidents). In contrast, some diagnostic statuses are underrepresented in the incident categories. Digestive disorder patients, for example, make up 10.3% of the patient population, yet are involved in only 8.4% of falls, procedure and treatment incidents.

The presence, level, and type of medication are significant factors in various aspects of incidents. Medications, especially multiple medications, are strongly related to patient falls. Over half (52.9%) of falls involve medicated patients, a far higher percentage than with any other incident category. As Figure 3 shows, the medication/falls relationship becomes even stronger when multiple medication levels are taken into account. Non-medicated incident patients have a fairly even spread with respect to the various types of incident involvement. In contrast,

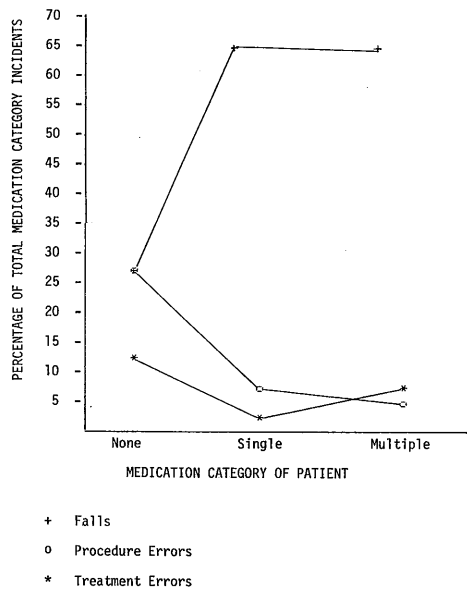


Figure 3. Patient incidents by type and medication level.

64.6% of single-medicated and 66.1% of multiple-medicated incident patients are involved in falls. The type of medication received is significant with respect to the likelihood of medication incident involvement. Drugs from the anti-infective, CNS, and electrolytic groups are involved in a collective 56.7% of medication incidents. The analysis also reveals that medication level is related to the likelihood of medication incidents as well as patient falls—52.7% of patients connected with medication errors are receiving more than one type of medication.

In summary, it appears that hospital patient incidents are highly related to a number of patient and treatment variables. In particular, patient age, diagnostic status, medication type, and medication level show a significant relationship. It is felt that this deserves further investigation which could lead to the establishment of predictive models of incident behavior in hospitals that could be used to reduce risks in the patient care environment.

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