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Incidents which Threaten Patient Safety Classified for Use in Teaching Operating Room Nursing

Elsie Dorothy Vivian Wendth

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COLLEGE OF MEDICAL EVANGELISTS

School of Graduate Studies

INCIDENTS WHICH THREATEN PATIENT SAFETY

CLASSIFIED FOR USE IN TEACHING

OPERATING ROOM NURSING

by

Elsie Dorothy Vivian Wendth

A Thesis in Partial Fulfillment
of the Requirements for the Degree
Master of Science in the Field of Nursing

May, 1959

I certify that I have read this thesis and that
in my opinion it is fully adequate, in scope and
quality, as a thesis for the degree of Master of
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I would like to express my sincere thanks to Miss Lucile Lewis for assisting me in the planning of this study and for her help in classifying the incidents for use.

Thanks are also due to Mrs. Winifred Edwards for the help she gave in the preparation of the study.

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PART I

IDENTIFICATION AND CLASSIFICATION OF INCIDENTS

CHAPTER I

THE SETTING OF THE STUDY

I. THE NEED

Operating Room Safety Hazards Need Identification

Spectacular events command the attention of those who read about them as well as those who are present when they occur. Headlines blaze with dramatic incidents and readers are frequently satisfied with limited information. The lesser incidents are frequently overlooked. Major hazards are guarded against while less dramatic and less severe situations which might become serious are often permitted to go by unnoticed.

This is true in the field of nursing just as it is in life in general. The fear of the occurrence of a threatening spectacular event can overshadow the little incidents that often occur and which present a threat to patient safety even though they cause no injury. These minor incidents must not be overlooked, for as Marshall has said:

The fact that most patient accidents incur no injury is not a justifiable excuse for ignoring the situation. The moral obligation of the hospital and

its personnel is at stake when a patient suffers an incident that is not consistent with his care and treatment.¹

Operating room nurses have spent much time discussing and actively participating in the prevention of explosions and fires in their area of nursing. One of the meetings at the 1957 National League for Nursing Convention was designed to emphasize the need for prevention of these major hazards. Much time and thought was spent in presenting and discussing methods by which these operating room hazards could be controlled.

Many articles concerning the prevention of fires and explosions in the operating room have been written because lives have been threatened or lost as a result of such occurrences. However, there is a scarcity of articles concerning the prevention of other operating room hazards. It is possible the emphasis on this major phase of patient safety has been so intense that other potential hazards to the patient have been overlooked. In one recent article, "Safety Measures in the Operating Room," Creber acknowledged that danger lay in the lack of recognition and understanding of

¹Kathleen Marshall, "An Analysis of Factors Involved in Hospital Patient Accidents," Unpublished Master's thesis, University of Buffalo, New York, June, 1958, p. 27.

operating room hazards. More than two-thirds of the article was allotted to the discussion of the dramatic hazards and less than one-third to the less dramatic hazards.²

Rolen said that it is often assumed that the accident prevention programs in hospitals only include fire prevention and evacuation procedures. This she attributes to the dramatic aspects of such accident prevention endeavors which cannot be overemphasized. She has stated:

The better the nurse, the more she does to protect the patients from injury, and thus automatically, to further the cause of accident prevention. . . .

Special activities should not be allowed to overshadow the more commonplace occurrences which contribute so much to keeping people safe day after day.³

Incidents Are Needed for Teaching Students of Nursing

Rolen also stated that "nurses are really safety experts and it is important that they realize it."⁴ Therefore, it is not unreasonable for the patient to expect safe nursing care from hospital personnel. Florence Nightingale

²Imogene Creber, "Safety Measures in the Operating Room," Nursing Outlook, 6:531, September, 1958.

³Marian Rolan, "The Nurses' Role in Accident Prevention," Nursing Outlook, 3:588, November, 1955.

⁴Ibid., p. 589.

pointed out that, "It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm."⁵

The responsibility for preventing these less dramatic hazards as well as the dramatic, rests with nursing personnel. Therefore, the teaching of safety should be included in the educational program for basic students of nursing. The instructor in operating room nursing should recognize the need for the prevention of hazards in order to teach patient safety to students of nursing.

The duration of time allotted to clinical experience for the student in operating room nursing is being shortened. This means the quality of teaching must be as meaningful as possible to the student. Stack and Siebrecht have said that "safety instruction should be active and whenever possible involve real situations rather than passive hypothetical problems."⁶ Because of the very nature of accident prevention it must be taught largely through vicarious learning. Muse stated that vicarious experience is valuable because:

⁵Florence Nightingale, Notes on Hospitals, Third edition, London, Longman's, 1867, cited by Anne L. Austin, History of Nursing Source Book, New York, G. P. Putnam's Sons, 1957, p. 271.

⁶Herbert J. Stack and Elmer B. Siebrecht, Education for Safe Living, New York, Prentice-Hall, Inc., p. 143.

It can become so active a reliving of events and emotions as to approximate direct experience. Indeed, scientific tests of physiological reactions during vicarious experiencing reveal that measurable physiological changes frequently take place within learners which are similar to those aroused by the direct experience.⁷

To encourage vicarious learning, incidents which have actually caused patients harm or have threatened their safety while in the care of operating room personnel could be used to supplement the teaching of concepts of safety. Teaching of safety must be an "on-going" or continuous process made meaningful by direct experience and vicarious learning.

II. THE PROBLEM OF THE STUDY

The Purpose of the Study

The purpose of this study was to identify incidents threatening the safety of patients in the care of operating room personnel and to classify them for use in teaching concepts of safety in operating room nursing.

Limitations of the Study

The following were limitations of the study:

1. Only recent incidents were identified. The definition of "recent" was left to those who contributed incidents.

⁷Maude B. Muse, Guiding Learning Experience, New York: The Macmillan Co., 1950, p. 133.

2. No attempt was made to identify incidents that might illustrate all phases of safety. Incidents which were most meaningful to the operating room supervisors and clinical instructors participating were reported.

3. It was recognized that there might be a reluctance on the part of some hospital personnel to participate in a study in which they were asked to disclose incidents that threatened safety of their patients.

4. Incidents were gathered from operating room personnel living in Illinois as this is the area in which the study-maker would be working.

Definition of Terms

The terms defined according to use in this study were:

Incident: any observed act that could harm the patient.

Harm: damage to tissue or psyche.

Safety: freedom from damage to tissue or psyche.

III. STEPS IN THE STUDY

The descriptive method of research was used to gather incidents for use in teaching concepts of safety in operating room nursing. Whitney stated that ". . . descriptive research is fact-finding with adequate interpretation."⁸

⁸Frederick Lamson Whitney, The Elements of Research, Third edition, New York, Prentice-Hall, Inc., 1950, p. 160.

The plan developed for the accomplishment of the purpose of the study consisted of the following steps:

1. Review of literature to find concepts of safety and to identify categories of patient safety that might help in classifying the incidents received.
2. Development of an incident report form.
3. Writing to directors of nurses in the 72 hospitals included in the study to ask permission to contact the operating room supervisors and clinical instructors.
4. Sending of letter and the incident report form to operating room supervisors and clinical instructors.
5. Classifying the incidents received.
6. Summarizing the study, drawing conclusions, and making recommendations for further study and for using the incidents in teaching safety.

This study has been prepared in two parts. Part I, Gathering and Classifying the Incidents, and Part II, The Incidents.

IV. SUMMARY

Much has been said about fires and explosions in the operating room. The question has been raised whether this emphasis on patient safety has been such that other

phases of safety in operating room nursing are being overlooked. The study was conducted to identify incidents threatening the safety of patients in the care of operating room personnel and to classify them for use in teaching concepts of safety in operating room nursing.

CHAPTER II

CONCEPTS OF SAFETY

There are many concepts to be understood about safety. It is the purpose of this chapter merely to review a few of the concepts about safety which operating room personnel should know. These have been considered as they relate to a definition of safety, the need for safety and safety education, causes of accidents and the need for specific rules or directives for maintenance of safety and prevention of accidents.

I. DEFINITION OF SAFETY

Safety is a much talked about subject, but one that is not specifically defined. In the areas of general safety, industrial safety, and hospital safety, much has been said about the need for safety and what safety accomplishes but there is inadequate definition of safety itself. In reviewing literature it was found that safety was defined in various terms: as a philosophy, as a concept, as an attitude, as a situation, as an environment. A philosophy of safety was expressed by Heyd in the following seven statements:

1. Safety is positive. It is a tangible and an absolute. There is no mysticism or chance in safety.

2. Safety is a habit.
3. Safety is good common sense.
4. Safety is everybody's business.
5. Safety involves basic economics.
6. Safety is good Christian living. . . we shall do unto others as we do unto ourselves.
7. Safety is a morale builder.¹

Long ago Tolman suggested that safety relieves tension and prevents accidents thus contributing to a safe environment.² McClain has defined safety in terms of the environment. She considers a safe environment to be one that implies "freedom from injury or possibility of injury. . . ."³ McClain considered that there are five types of accidents in hospitals: (1) mechanical, (2) thermal, (3) chemical, (4) bacteriological, and (5) psychological.⁴

Safety means the same thing wherever it is considered. "Most of the hazards of one kind of occupation are like most of the hazards of any other kind of occupation."⁵ Hospitals by their very nature are particularly expected to be places

¹Edward H. Heyd, "One Man's Philosophy of Safety," Hospital Management, 81:47, February, 1956.

²William H. Tolman and Leonard B. Kendall, Safety, New York: Harper and Brothers Publishers, 1913, p. 8.

³Esther McClain and Shirley Hawke Gragg, Scientific Principles in Nursing, Third edition, St. Louis: The C. V. Mosby Company, 1958, p. 50.

⁴Ibid.

⁵Hospital Safety Manual, Chicago: American Hospital Association and the National Safety Council, 1954, p. 6.

of safety, and in general, hospital hazards are similar to those in other industries. However, there is one area which has different hazards, and that area is the operating room.⁶

II. NEED FOR SAFETY AND SAFETY EDUCATION

Accidents, as a cause of death in the United States, are surpassed only by diseases of the heart, malignant neoplasms and vascular lesions of the central nervous system.⁷ Florio pointed out that our country has an injury occurring every three seconds and a fatality every six minutes.⁸ There is financial loss associated with every injury and "every job involves hazards which, if not put under control, can cause injury."⁹

The need for safety is dynamic; it is ever changing. In a safety monograph for colleges and universities this fact was corroborated:

⁶Ibid.

⁷President's Commission on the Health Needs of the Nation, Building America's Health, America's Health Status, Needs and Resources--A Statistical Appendix, Vol. III, Washington: Government Printing Office, 1953, p. 36.

⁸A. E. Florio and G. T. Stafford, Safety Education, New York: McGraw-Hill Book Company, Inc., 1956, p. 3.

⁹Hospital Safety Manual, Chicago: American Hospital Association and the National Safety Council, 1954, p. 3.

Our scientific and technological advances are so rapid and result in such complex safety problems that we are experiencing increasing difficulty in obtaining available technical information for our safety programs.¹⁰

The need for safety extends into all phases of life and when disregarded, tragedy can occur.

It would seem that the prevalence of accidents in our society warrants a sound educational program in prevention of accidents and the consistent practice of safety. Although it is a common assumption that people do simple tasks without instruction, this can be an unreliable supposition. Records kept of incidents that occur show this fallacy. A person placed in unfamiliar circumstances to work with unfamiliar equipment and routines will not "naturally" know how to exercise safety.¹¹

The industrial field has given evidence of what safety education has accomplished. The National Safety Council has provided data showing the decline of accidents where safety programs have been instituted.¹²

¹⁰Fifth National Conference on Campus Safety, Safety Monographs for Colleges and Universities, Chicago: California Institute of Technology and National Safety Council, 1958, p. 13.

¹¹Hospital Safety Manual, Chicago: American Hospital Association and National Safety Council, 1954, p. 27.

¹²Ibid., p. 5.

III. CAUSES OF ACCIDENTS

Accidents are frequently thought of as being unusual but they are natural products of unorganized ways of life presenting problems which originated from the failure to control conditions of life.¹³ The National Safety Council expressed this same idea by suggesting that accident prevention involved: (1) machines, equipment and working conditions which are hazardous, (2) the failure of personnel to act in a safe manner, and (3) a combination of the two problems.¹⁴

The American Hospital Association considers that accidents are caused by unsafe acts and unsafe conditions.¹⁵

Yoder blamed accidents on three causes: (1) unsafe working conditions, (2) unsafe manner of conducting business, and (3) employment of incompetent workers.¹⁶

¹³Herbert J. Stack and Elmer B. Siebrecht, Education for Safe Living, New York: Prentice-Hall, Inc., 1942, pp. 18 and 22.

¹⁴National Safety Council, Accident Prevention Manual for Industrial Operations, Chicago: William H. Poole Company, 1946, p. 486.

¹⁵"principles of Hospital Safety," Hospitals, 30:43, May 16, 1956.

¹⁶Dale Yoder, Personnel Management and Industrial Relations, New York: Prentice-Hall, Inc., 1943, p. 482.

Other causes of accidents were incomplete instruction, lack of organization, carelessness.

The operating room is considered to be a highly organized department but the presence of threatening incidents indicates that there is need for greater efficiency of organization. It is necessary to find the true causes of the incidents that occur. So often the true cause is covered up by the explanation that the incident occurred because of carelessness. "In reality, it may have been due to lack of information, insufficient skills, improper attitudes--in other words, to incomplete instruction."¹⁷ These same ideas were expressed by Yoder.¹⁸

People themselves are the most important factors in the cause of accidents. Even the most highly organized department cannot accomplish its purpose to provide safe care unless the personnel in the department are safe individuals. A "safe" individual according to Stack is "one who is well informed, possesses superior skills and desirable attitudes and uses these in his everyday activities."¹⁹ If the operating room nurse is a "safe" person, she should possess these

¹⁷Stack, op. cit., p. 42.

¹⁸Yoder, op. cit., p. 489.

¹⁹Stack, op. cit., p. 41.

attributes and should be able to provide a safe environment for the patients in her care. In order to assure safe operating room nurses, an on-going educational program is urged for inservice study of safety, as well as a thorough safety education program for students of nursing.

IV. CATEGORIES OF ACCIDENTS AND DIRECTIVES

As there is so much about safety that is similar regardless of the place of application, it was thought there might be some classification of principles which would aid in the understanding of safety. In studying the previously referred to safety manuals, and reference books such as those by Alexander,²⁰ Berry and Kohn,²¹ Harmer and Henderson,²² and Walters,²³ such a general list was not found. One list of incidents occurring in hospitals was compiled by Ludlam. He

²⁰Edythe Louise Alexander, The Care of the Patient in Surgery Including Techniques, Third edition, St. Louis: C. V. Mosby Company, 1958, pp. 41-71, 128-146.

²¹Edna Cornelia Berry and Mary Louise Kohn, Introduction to Operating-Room Technique, New York: The Blakiston Division McGraw-Hill Book Company, Inc., 1955, pp. 22-29, 39-45.

²²Bertha Harmer and Virginia Henderson, Textbook of the Principles and Practice of Nursing, New York: The Macmillan Company, 1955, pp. 225-226, 1000, 1012-1013.

²³Carl W. Walter, The Aseptic Treatment of Wounds, New York: The Macmillan Company, 1948, pp. 4-21, 188-189.

classified hospital incidents in fifteen categories. He included such categories as "Accidents in bed," "Baby identification," "Surgery and delivery incidents."²⁴

It seemed that when safety is considered in operational terms, discussion centers around rules, or directives for accident prevention in a particular situation. Such a list of directives was prepared by the California Hospital Association in the Hospital Safety Manual and includes several in general surgery safety such as "Surgical rooms should have swinging doors with glass partitions."²⁵

Quint at University of California at Los Angeles compiled a list of what she termed "Basic Concepts of Patient Care During Surgery." This list included nursing care categories such as Maintaining a Safe Environment: Equipment and Clothing; Maintaining a Safe Environment through Surgical Asepsis; Practices to Ensure Maintenance of Sterile Field; Impact of Experience on the Patient; Anesthesia; Teamwork in the Operating Room; and Patient's Position. Some of these categories included such statements as "Spores of most heat

²⁴James F. Ludlam, "Guide to a Planned Safety Program," Hospitals, 29:68, December, 1955.

²⁵Hospital Safety Manual, Council on Insurance, California Hospital Association and Argonaut Insurance, [n.d.] p. 4.

resistant organisms are destroyed at 270° F,"²⁶ "Certain activities are set up to ensure a safe experience for the patient."²⁷

It will be noticed that these lists of categories and directives are too general to fit the purpose of this study.

V. SUMMARY

A review of literature was made in the fields of general, industrial, and hospital safety. There was difficulty in finding adequate definition of the term safety. The need for safety, and safety education, was evidenced through the reported high incidence of accidents and the decrease of accidents in areas where safety programs were in effect. Equipment, working conditions and people were found to be the major causes of accidents.

Rules or directives for accident prevention have been developed for use in various occupations for encouraging safety. Such lists have been developed for use in hospitals. It would seem there is not a comprehensive list of such rules or directives for particular use in the operating room.

²⁶Jeanne Quint, "Basic Concepts of Patient Care During Surgery," N125AB Medical-Surgical Nursing, Part II, Los Angeles, School of Nursing, University of California Medical Center, [n.d.], p. 4. (Mimeographed.)

²⁷Ibid., p. 12.

CHAPTER III

GATHERING THE INCIDENTS

One purpose of the study was to identify incidents that threatened the safety of patients in the care of operating room personnel. In order to accomplish this purpose, it was necessary to determine a method by which these incidents could be obtained.

I. THE METHOD OF THE STUDY

The Critical Incident Defined

In an attempt to locate unexpected sources of safety hazards in the operating room as revealed in accidents or near-accidents, the critical incident technique was used as the method for obtaining incidents for use in this study. An incident has been defined to mean any observed act that could harm the patient. However, in order for an incident to be critical, it must have a purpose or intent that is fairly clear to the observer and the consequences are sufficiently definite so that its effect is not doubtful.¹ Flanagan who developed the critical incident technique described it as follows:

¹John C. Flanagan, "The Critical Incident Technique," Psychological Bulletin, 51:327, July, 1954.

. . . The critical incident technique is essentially a procedure for gathering certain important facts concerning behavior in defined situations. . . . The critical incident technique does not consist of a single rigid set of rules governing such data collection.²

One of the applications of the critical incident technique can be made in the area of routine activities called "operating procedures" or "operations." Flanagan points out that systematic analysis of detailed factual data on successes and failures is of great importance in improving the effectiveness and efficiency of operations.³

An unsuccessful attempt was made to obtain the study by Vasilas, Fitzpatrick, DuBois and Youtz in which they developed procedures for collecting critical incidents relating to near-accidents in flying. Some of the information obtained in their study was made available in Research Notes in which the authors encouraged analysis of near-accidents as a means of prevention:

The effect of accidents and near-accidents are different. But so far as their causes are concerned, near-accidents do not seem to be in any fundamental way different from accidents.

Can they, then, be used to supplement accident reports as aids to prevention? . . . Accident prevention efforts should be concentrated on the aspects of the situation which can most easily be changed.

²Ibid., p. 335.

³Ibid., p. 352.

What is needed as a basis for this kind of change is a series of detailed statements which describe what happened to bring on hazardous situations. . . . It seemed that such a basis might be available in reports of near-accidents.⁴

The Incident Report Form Developed

Because the critical incident technique involves the description of a particular action, an incident report form was developed (Appendix A) to provide a uniform method for reporting incidents which had threatened the safety of patients. Respondents were asked to identify themselves only by position. Space was provided in which to describe the incident that had occurred, to give the factors that contributed to the occurrence of the incident and to indicate how the incident might have been prevented.

The Use of the Report Form

As this study was designed to obtain material for use in teaching concepts of safety in operating room nursing and as the studymaker was personally acquainted with operating room personnel in the Great Lakes Region and would be teaching in Illinois, it was decided to include those hospitals in Illinois within which students of nursing received their

⁴"Research on Near Accidents," Research Notes, Pittsburg: American Institute for Research, September, 1953, p. 1.

operating room experience. A list of the 72 state accredited schools of nursing was obtained from the Illinois State Department of Registration.

Letters were sent to the 72 directors of nurses asking for permission to include the operating room clinical instructor and operating room supervisor in the study. A copy of the incident report form was enclosed and a self-addressed air mail postal card on which the director was asked to write the names of the operating room supervisor and operating room clinical instructor. Also provided on this card was a space to check whether or not a copy of the findings of the study was desired. (Appendix A)

Follow-up double postal cards were sent out two and one-half weeks later. These cards were self-addressed and provided a return form to be used if the original card had been misplaced. Fifty-one, or 71 per cent, of the directors replied.

The Response Obtained

Of the 51 who replied, five declined participation in the study, two of whom were directors of university schools of nursing who stated they had received no reports of incidents such as those requested. Of the three directors associated with hospital schools, one reported that "the

accidents occurring in the operating room for which a nurse might be liable were too infrequent for us to participate in any study of errors." Another stated: "We have no incidents involving the safety of the patient in the operating room." The third director gave no reason other than "We do not wish to participate."

Letters asking for cooperation in the study were mailed to the operating room supervisors and clinical instructors as soon as the names were received from the directors. The incident report forms and a self-addressed air mail stamped envelope were enclosed with this letter. Follow-up cards were mailed two weeks later. (Appendix A)

Fifty, or 76 per cent, of the 66 air mail letters sent to the operating room supervisors and clinical instructors were answered. Replies were received from 28, or 65 per cent, of the 43 operating room supervisors and from 22, or 96 per cent, of the 23 operating room clinical instructors.

It was not always possible to identify positively from the reports the position of the participant. On some forms there was no identification of position. From others it was not possible to determine whether or not the participant held a dual position. Where there was doubt or where there was indication the participant held a dual position the respondent was considered to be a supervisor.

Three completed forms were not pertinent to the study and had to be discarded. Of these, two were concerned with the safety of operating room personnel rather than the patient. The third expressed the fear of accidents that could occur rather than those that had occurred.

Eight forms were returned without incidents recorded. Seven of these had explanations and one did not. One clinical instructor stated: "I have neither observed nor had any incidents reported to me in months." She expressed confidence in a very active in-service program which she felt was effectively eliminating problems in the operating room. Another instructor was unable to think of any specific incidents that had occurred and thoughtfully listed some of the rules in effect in the operating room regarding explosion hazards. Three of the supervisors made the following statements: (1) "We have not had such incidents during the past few years," (2) "As long as I have been working in the operating room no incidents threatening the safety of patients have been observed," (3) "We try. . . to take precautionary measures so that the incidents such as you want reported will not occur." It could be in these instances that the less dramatic threats to patient safety are being overlooked, for as Creber has pointed out, "Operating room hazards are not always

recognized or understood--and there is where the danger lies."⁵

One supervisor wrote a letter expressing the thought that hospitals are prone to try to cover up incidents that happened and that consequently answers on the forms would not be accurate. The form was described as being difficult to answer because it asked to "pinpoint too specifically."

Thirty-nine operating room personnel submitted 100 usable incidents. These incidents were classified according to the nature of the incident as indicated in the next chapter.

II. SUMMARY

A list of the 72 state accredited schools of nursing in Illinois was obtained and letters asking for participation in the study were sent to the directors of nurses and to the operating room supervisors and clinical instructors. Incident report forms accompanied these letters to which 76 per cent of the supervisors and instructors replied. One hundred usable incidents were received from 39 participants.

⁵Imogene Creber, "Safety Measures in the Operating Room," Nursing Outlook, 6:531, September, 1958.

CHAPTER IV

CLASSIFICATION OF INCIDENTS

I. METHOD OF CLASSIFICATION

One hundred usable incidents were received that had caused accident or threatened the safety of patients who were in the care of operating room personnel. These incidents were classified to facilitate their use for teaching concepts of patient safety.

The classification of incidents could have taken several forms. As was indicated in Chapter II, safety has been considered in different ways. The most helpful of these for the purpose of this study were by type of accident as indicated by McClain:¹ mechanical, thermal, chemical, bacteriological and psychological; by cause of accident, for example as given by Yoder:² unsafe working conditions, unsafe manner of conducting business, and employment of incompetent workers; and by

¹Esther McClain and Shirley Hawke Gragg, Scientific Principles in Nursing, Third edition, St. Louis, The C. V. Mosby Company, 1958, p. 50.

²Dale Yoder, Personnel Management and Industrial Relations, New York: Prentice-Hall, Inc., 1943, p. 482.

principles or rules of safety such as listed by Quint:³ for example, nurse needs to be alert to breaks in technique of self and others. These ways were considered as possible means of classifying the incidents in this study. However, it was felt a classification that would more nearly fit into an instructor's outline for teaching operating room nursing would be more meaningful, and the following categories and sub-categories were established:

- A. Incidents pertaining to the use of supplies
 - 1. Sponges
 - 2. Needles
 - 3. Instruments
 - 4. Other supplies

- B. Incidents pertaining to the use of equipment
 - 1. Equipment for positioning the patient for surgery.
 - 2. Equipment that caused burns
 - 3. General equipment

- C. Incidents occurring during anesthesia
 - 1. Preparation for anesthesia
 - 2. Explosions and fires

- D. Incidents occurring during transportation
 - 1. Falls
 - 2. Other than falls

³Jeanne Quint, "Basic Concepts of Patient Care During Surgery," N125AB Medical-Surgical Nursing, Part II, Los Angeles, School of Nursing, University of California Medical Center, [n.d.] , p. 4. (Mimeographed.)

E. Incidents related to asepsis

1. Attaining sterility
2. Maintaining sterility

F. Incidents concerned with identification

1. Identification of the patient
2. Identification of the operative site
3. Identification of medications

G. Incidents concerned with patient preparation for surgery

The number of incidents reported by participants in each category has been illustrated in Figure 1.

It was felt that classified incidents alone would not be especially meaningful to the instructor for teaching purposes. For this reason a list was prepared which included the factors that had contributed to the incident, generalizations for prevention of accidents identified from the incidents, and generalizations put in behavioral terms in the form of directives.

In analyzing the data on the incident report forms it was found that incidents and their contributing factors could be used directly. However, there was some overlapping of measures which might have prevented incidents. These were used for developing the directives for safety within each main category of incidents. The incidents, the contributing factors, and the directives for safety have been prepared in table form to facilitate usability in teaching. (Part II).

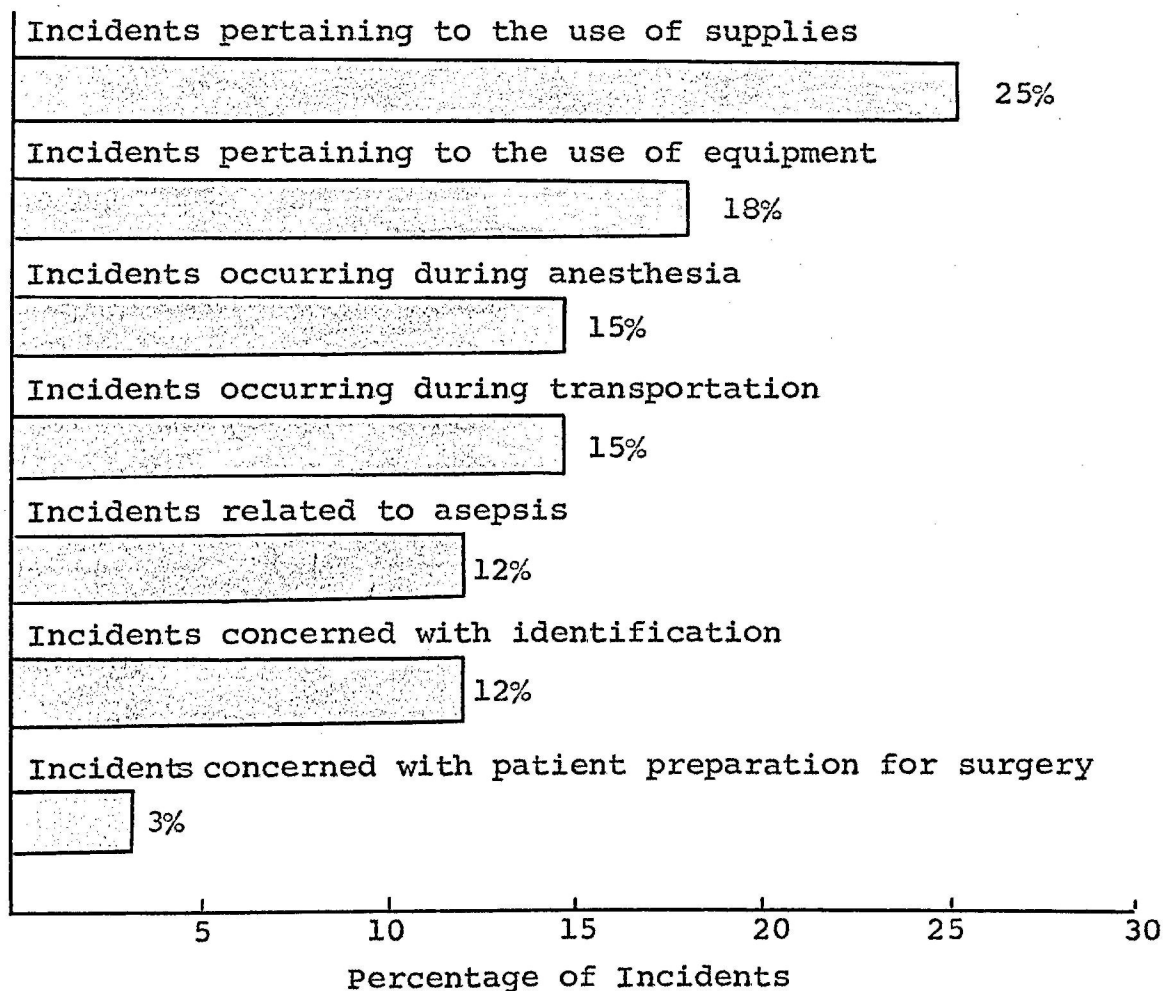


FIGURE 1

PERCENTAGE OF INCIDENTS REPORTED THREATENING THE SAFETY OF THE
PATIENT IN THE CARE OF OPERATING ROOM PERSONNEL
ACCORDING TO SPECIFIED CATEGORIES

The preventive measures which were suggested by those who participated in the study were included in Appendix B.

As a guide in the discussion of the classification of incidents, two aspects were considered: (1) the nature of incidents which included a brief description of the types of incidents which were included in the particular categories and the number of incidents received in each category, and (2) the contributing factors which contributed to occurrence of incidents.

II. INCIDENTS PERTAINING TO THE USE OF SUPPLIES

The Nature of Incidents

The largest group of incidents reported in this study accounted for 25 per cent of all incidents. These were related to accidents or near-accidents which had to do with the preparation and use of supplies. In this group were considered the smaller supplies such as sponges and needles used in operating room nursing, as opposed to the larger or heavier items used and termed "equipment" in this classification.

Sponges. Eleven incidents pertained to missing sponges and discrepancies in sponge counts. Sponges were left in the wound in six instances and three incorrect sponge

counts were reported. One report told of the wrong type of sponge being used by a nurse who was new in the situation. Another nurse stated that she had caught herself counting sponges automatically in some instances and had not remembered taking a count in other instances.

Needles. Needles were responsible for problems in eight instances. Four needles were lost and the others were either broken, the wrong type, or contaminated by pricking a gloved finger. One report stated that one extra needle was counted. Atraumatic or swaged-on needles were the cause of incorrect counts in three instances.

Instruments. Instruments just taken from the autoclave were responsible for actual burns in two instances and presented a threat in the third. The doctor was in a hurry and in spite of the fact that the nurse told him the instrument was hot, he used a urethral sound that had just been removed from the autoclave. Hemostats that had not been cooled before use caused a first degree burn. Other instruments were placed on the scrub table and could have burned the patient if used right away.

Other supplies. The lack of chest drainage tubes needed when a routine chest operation presented an emergency aspect was reported in one instance. One report was made of

suture tubes that crushed when opened, presenting the danger of introducing glass into the wound. Another incident told of a small part of an instrument found on the floor following surgery, the loss of which went unnoticed during the operation.

Summary of Contributing Factors

1. More care was needed in the handling of sponges by members of the operating team.
2. Not all sponges used in the operative wound were counted.
3. The use of atraumatic needles presented added problems when checking the needle count.
4. Needles were improperly used and lacked identification.
5. Care of instruments was lacking during the operation.
6. Instruments that had not been properly cooled were responsible for burns of patients.
7. More conscientious application of principles was needed in the preparation of supplies.

III. INCIDENTS PERTAINING TO THE USE OF EQUIPMENT

The Nature of Incidents

The term equipment used in this classification refers to the larger and heavier items such as table attachments used in operating room nursing. There are many types of equipment used in an operating room and the nursing personnel needs an understanding of the purpose of each piece of equipment and

how to use it safely. Eighteen per cent of the incidents received were caused by faulty or improper use of equipment.

Equipment for positioning the patient. Six incidents reported in this study involved positioning of the patient and the use of the operating table and its parts.

One supervisor reported the tipping of the operating table when a patient was on it and both the patient and table fell over onto the floor. Another told of the lack of arm restraints so that the patient who was under very light anesthesia reached up and placed her hand in the incision which was being made. A patient suffered a fracture of the toe when her legs were being placed for lithotomy position. A thin patient was reported to have developed a brachial plexus paralysis following pelvic surgery from the improper use of shoulder braces.

One more reported that the arm boards frequently fell off from the table which could injure the shoulder. Still another told about the patient for vaginal surgery who was moved from the cart to the table and the foot end of the table gave way. The patient nearly fell to the floor but was caught by the nurse.

Equipment that caused burns. Four electrical burns were incurred through the use of the electro-surgical unit.

All of the patients were burned by the indifferent electrode placed under the patient but the contributing factors were different. In two instances the equipment was faulty: wires were loose and insulation was worn off the cord. A loose wire, the "springly" lubricated indifferent electrode and a faulty contact between the electrode and the patient caused another burn.

A hot flask of water was dropped from the carrier designed especially to hold the flask. This could have burned a patient.

General equipment. Two reports told of the need for a resuscitator when a patient suddenly "went bad" on the operating table. No resuscitator was available in the department so one had to be brought up from the emergency room. Although this equipment may not be common to the operating room, it was suggested that such equipment should be kept in a central location.

Equipment used in cystoscopy presented threats to patient safety in two instances. The switches were faulty on both the cystoscopy table and formalin cabinet. The patient was on the table and when the switch was turned on, the control started to smoke and fumes filled the room. The formalin cabinet was said not to be dependable for sterilization of supplies because of the switch.

One instance was reported in which the nurse tripped over a light cord and could have pulled the light over injuring the patient.

During the removal of a cast, the patient's leg was lacerated and the respondent stated that the doctor should have used more padding under the cast.

Utensils dropped while being carried out of the room caused the patient who was having surgery under local anesthesia to jump. This could have been very harmful to the patient if the surgery had been at a crucial point.

Summary of Contributing Factors

1. The need for a resuscitator was not met immediately because the equipment was in another department.
2. The timer on a sterilizer was installed improperly so that the sterility was questionable.
3. The patient was on a cystoscopy table that could not be used because of a faulty switch that was fuming and smoking.
4. Because an operating table was old and in faulty condition, both the table and the patient fell on to the floor.
5. A patient received a laceration from a cast cutter because it was used incorrectly.
6. Noise from utensils being dropped caused a patient under local anesthesia to jump. This could have caused harm.
7. A patient under light anesthesia put her hand into the wound because no arm restraints had been used.

8. A patient received a fractured toe during positioning for operation by one unfamiliar with the equipment.
9. A brachial plexus paralysis was caused by incorrectly placed shoulder braces.
10. Armboards falling off from the table were due to carelessness or lack of knowledge in attaching the armboards to the table.
11. A patient nearly fell from the table when the foot end of the table dropped because it had not been properly secured.
12. Faulty wiring was responsible for burns of patients when the electro-surgical unit was used.
13. An insufficient amount of lubricating jelly on the indifferent electrode was considered to be the cause of a burn.
14. Improper placement of the indifferent electrode was the apparent cause of a burn.

IV. INCIDENTS OCCURRING DURING ANESTHESIA

The Nature of Incidents

Although anesthesia is a separate department from surgery the two are inter-dependent, sharing some of the problems of patient care. The safety of the patient is dependent on personnel from both departments. Of the 15 per cent of incidents which occurred during anesthesia, some occurred during induction of anesthesia in which operating room personnel had a definite responsibility. Others were concerned with explosions and fires. While this study was

mainly concerned with incidents other than fires and explosions, such hazards which were reported were included in the study.

Preparation for anesthesia. One report stated that the operating room personnel were under pressure because the schedule was running late; because of this the chart of one patient was not checked before the patient was anesthetized. As a result, anesthesia was started without the patient having had the benefit of the pre-anesthesia medication.

Two patients fell from the operating table during the induction stage of anesthesia; in one instance the circulating nurse was not standing beside the patient and in the other, the restraint strap had not been applied. One report told of a circulating nurse who was out of the room at the time the incision was made; this could have been a crucial moment.

An example of what can happen when the circulating nurse is not in immediate attendance was reported in the following instance. An eleven month old baby was lying on the operating table with the restraint strap secured over the baby. The anesthetist had been working with the child and the circulating nurse had taken a few steps away from the table. In just "seconds" the baby had rolled onto the floor

in spite of the restraint, because each of the two people thought the other person was watching the patient.

In one hospital the operating room personnel prepared the procaine used for local anesthesia. One operation was performed under local anesthesia and when the patient experienced severe pain it was discovered that the procaine crystals had not been added to the solution. In another instance the scrubbed nurse preparing the procaine for use, added one cubic centimeter of adrenalin instead of the prescribed three drops. The error was found when the surgeon checked the solution for the amount of adrenalin used.

An anesthetist placed a sponge saturated with aromatic spirits of ammonia in front of the face of a patient after tonsillectomy had been performed. The child was in prone position and the sponge got under her face burning it severely during transportation from the operating room to the ward.

Explosions and fires. During a cesarean section a spark was created by the nurse from the maternity ward who was not wearing conductive shoes. Another report stated that an explosion occurred because one of the personnel was not wearing conductive shoes. In another instance, the anesthetist's helper was adjusting the light and "sparks flew"

when she touched the light. She too was wearing non-conductive shoes.

In another case the anesthetist pumped the breathing bag when a semi-closed system was used. This forced the gases out into the room adding to hazard of explosion.

One report told of the threat presented by doctors who concealed lighted cigarettes while in the corridor of the operating room and who even went to the door of an operating room and talked to the surgeon who was operating.

Fire occurred in one operating room when the cautery was used and the excess "prep" solution that had accumulated on the indifferent electrode ignited. In another situation, the doctor who was using cautery asked the nurse for an alcohol sponge which could have caused fire.

Summary of Contributing Factors

1. Pressures of a schedule running late caused personnel to neglect to check the chart so that a patient did not have the benefit of pre-anesthesia medication.
2. The circulating nurse did not remain beside the patient during induction of anesthesia.
3. Personnel wearing non-conductive shoes caused sparks which could have caused explosions.
4. Fires occurred because of the use of alcohol in the presence of cautery.
5. Aromatic spirits of ammonia on a sponge caused a severe burn on the face of a child.

6. Procaine crystals were left out of the preparation of the solution because the procedure was not carried to completion by one person.

V. INCIDENTS OCCURRING DURING TRANSPORTATION

The Nature of Incidents

One phase of operating room nursing of major importance to the safety of the patient is that of transportation. Transportation includes moving the patient on and off the litter to or from the table or bed. The litter patient, according to Morris, is always in a precarious position.¹ In this study, incidents involving transportation accounted for 15 per cent of all occurrences and were classified into sub-areas.

Falls. There were ten incidents reported involving falls and of these, four were actual falls and six were situations in which the patients nearly fell. One patient fell from the stretcher as the orderly reached down to get the restraint to place over the patient. Another patient actually fell and two others nearly fell while being moved from the stretcher to the table or bed because the stretchers were not stabilized. Another patient fell when the wheel of the stretcher caught in the space between the elevator and the

¹John Morris, "Solving Patient and Visitor Safety Problems," Hospitals, 30:51, May 16, 1956.

floor and still another fell from the stretcher in the recovery room because the siderails had not been put into use. The remaining four incidents reported were of patients who were left unattended and without the safeguard of siderails or restraint straps. In two of these instances, restraint straps were provided but not utilized, and in the other two instances no restraints were provided.

Other than falls. There were five incidents other than falls which occurred during transportation. An arm was injured while the patient was wheeled through the doorway. Contrary to policy, a patient was brought to surgery wearing dentures. An anesthetized patient was left unattended in the hallway. A patient was returned to the ward without a proper airway and was cyanotic because the orderly transporting the patient was untrained in caring for the anesthetized patient. A patient was placed incorrectly on the stretcher by untrained personnel making it difficult to obtain shock position as needed.

Summary of Contributing Factors

1. Incidents involving falls and other occurrences during transportation were the result of carelessness of operating room personnel.
2. No restraints were provided.
3. Operating room personnel had been given responsibility for which they had not received instruction.

4. Falls which occurred during the transfer of the patient to or from the stretcher resulted from lack of personnel and lack of immobilization of the stretcher.

VI. INCIDENTS RELATED TO ASEPSIS

The Nature of Incidents

The safety of the patient in the care of operating room personnel is dependent on many factors of which asepsis has become one of major importance. There are two aspects concerned with asepsis, that of attaining sterility and that of maintaining it. The majority of incidents concerned problems related to asepsis in which non-nursing personnel were indicated as being responsible. The reports of incidents involving asepsis totalled 12 per cent of all reports received.

Attaining sterility. One incident told of a situation in which unsterile wrapped instruments were almost used. No indicator had been used on either the inside or the outside of the wrapper but the mistake was revealed when another package with an indicator registered "unsterile." Tracing the problem to its source revealed that the time clock had been read incorrectly and the autoclave was opened much earlier than it should have been. In another instance a basin was unsterile but was indicated as such by the pressure-sensitive tape used on the wrapper.

Maintaining sterility. A situation was cited in which the scrubbed nurse passed several instruments behind the doctor's back before she covered his back with a sterile towel.

The problem of contamination from street dust was indicated by reports of three incidents in which doctors walked into the operating rooms wearing street clothing. The "houseman" who delivers linen to the departments and is also responsible for the burning of trash and rubbish while wearing the same uniform was reported as another member of the hospital personnel contributing to the problem of air-borne contamination. Also presenting this threat is the keeping of contaminated linen in a small area with other operating room linen until it could be taken to the laundry by the personnel delegated this responsibility. Another report told of a wound infection which suggested the possibility of a break in aseptic technic. In two instances dust presented problems as it fell from the track of the overhead light and from the conduits of the air conditioning system.

One report stated that the maintenance man was found changing filters in the sterile water tanks and was running unsterile water into the tanks to test the filters for leakage. This incident occurred while the schedule was still in progress and the maintenance man had entered without asking permission.

Summary of Contributing Factors

1. An indicator had not been used so that the discovery of the unsterile item was made accidentally.
2. There were personnel who insisted on coming into the operating room in street clothing thereby contributing to air-borne infection.
3. Contaminated linen presented a problem of cross-contamination.
4. The position of the members of the operating team made it necessary to pass instruments behind the surgeons back; this was done without the protection of a sterile towel on his back.
5. Lack of good housekeeping presented the problem of dust falling from equipment.
6. The sterile water supply was contaminated when the filters were changed during the surgery schedule.

VII. INCIDENTS CONCERNED WITH IDENTIFICATION

The Nature of Incidents

Identification plays an important part in the life of each person. The safety of the patient who comes to the hospital for care is dependent to some extent on identification. Only as he is identified can the patient receive the treatment prescribed for him by his physician. Of the incidents received, 12 per cent show the importance of identification of the patient, the operative site, the medications used. Six incidents pertained to patient identification, one to the identification of the operative site, and five to mistakes in the identification of medications.

Identification of the patient. Two children who were scheduled for tonsillectomy and adenoidectomy at the same hour were placed in the wrong operating rooms and the wrong doctor operated on one of the children before the mistake was discovered. This same type of mistake occurred in another instance but was discovered before the anesthetic was started. Wrong patients were brought to the operating room in two instances and the wrong chart was brought on one occasion. One report was made of the occurrence of a lost identification tag.

Identification of the operative site. A child was anesthetized to have a foreign body removed from his hand when a surgeon came in prepared to do the removal of the child's tonsils. The anesthetist had to do some "fast talking" to keep the doctor from removing the tonsils of a child who was to have a foreign body removed. In this situation, the schedule was running late and the doctor who had not been informed of the delay walked into the room to do his scheduled operation without checking the identity of the patient. The nurse could have prevented this from happening by notifying the doctor of the delay in the schedule.

Identification of medications. In three instances the wrong type of medication was injected because of lack of

identification of the several solutions in medicine cups on the scrubbed nurse's table.

A pint of type "A" positive blood was given to a patient with type "A" negative blood. The error was revealed several days later when a patient questioned being charged for a pint of blood when she had not received any. Clinical laboratory personnel found the error. The patients receiving the blood had the same type of surgery and the names of the doctors were the same. Apparently this information had been checked rather than the name of the patient who was receiving the blood.

One patient had her throat sprayed with formalin because the doctor filled the atomizer from a pontocaine bottle that had been filled with formalin to be used as a specimen jar. The label was still on the bottle as it had been only partially removed.

Summary of Contributing Factors

1. Patients were placed in the wrong operating rooms by personnel who did not adequately identify the patient.
2. Wrong patients were brought to the operating room by new personnel who did not adequately check the identification tags.
3. The wrong chart was brought with the right patient because it had been filed incorrectly in the rack and was not identified by the personnel.

4. An identification tag was lost because it was made from adhesive and did not adhere when the patient perspired.
5. A child nearly had the wrong operation performed because the surgeon had not been informed of a delay in the surgery schedule and started to operate on the child without identifying him first.
6. Wrong medications were given because they were not identified.
7. The wrong blood was given because the labels were not checked completely.
8. A throat was sprayed with formalin because a specimen jar still retained the original label although it was being used for a specimen jar containing formalin.

VIII. INCIDENTS CONCERNED WITH PATIENT

PREPARATION FOR SURGERY

The Nature of Incidents

The preparation of the patient for surgery should mean more than the immediate preparation of the patient in the operating room. The emotional and physical preparation should be of such nature that the patient can have confidence in the personnel caring for him.

Two incidents concerning the physical preparation of the patient were reported. The preliminary preparation of the patient had not been done the night before surgery according to the routine of the hospital, nor had the omission

of the "prep" been reported by the nurse who was unable to do it. Consequently the preparation had to be made on the operating table when the patient was under anesthesia. The other incident was the report of the irritation of the skin of the perineum and thighs of a patient following perineal surgery due to an excess of disinfectant solution.

The emotional factor and the psychological trauma suffered by the patient when routines were not carried out properly was reported by one operating room supervisor in the following incident. A female patient was admitted to the operating room for an operation that required the signature of both the husband and the wife. The husband had not been asked to sign the surgical permit and it was not possible to contact him when the error was found in the operating room. The operation had to be postponed.

Summary of Contributing Factors

1. A patient had an increased amount of anesthesia because the preliminary "prep" had not been done nor reported and had to be carried out on the operating table.
2. The skin of a patient was irritated by the disinfectant used in preparing the skin for operation and the excess amount had not been removed.
3. New staff members on the ward were not familiar with the hospital routine and there was no check list on the chart that could be used as a reminder for routine legal consent for surgery.

IX. INTERPRETATION

One of the values of the course in operating room nursing for students is the vividness of the teaching situations. Students have had courses in bacteriology; they have studied asepsis in relation to general patient care. In the operating room the instructor has opportunity to explain in a more dramatic way the science of bacteriology. For example, in the laboratory the student grew bacteria on broth media, incubated them in a warm, dark climate and watched them grow. Now the student is told of the need to prevent the introduction of bacteria into the warm, dark wound. Or, in physics class the student learns the law of leverage. Now this is illustrated in terms of safety in correct holding of suture needles; unless the needle is held correctly in the jaws of the needle holder, there is danger of breakage. In giving general care to patients students are told of the need to provide means for protecting the patient who is unable to protect himself. In the operating room the patient who has been given medication to help him relax and be less apprehensive, must have constant personal attention to protect him from injury. This is particularly important during induction and recovery from anesthesia. This learning must take place before an accident

occurs and can be taught vicariously through the use of incidents.

It is doubtful that the 100 incidents classified in this study provide examples of all the incidents that could happen to threaten patient safety in the operating room. For example, very few incidents were reported that related to asepsis. It may be that this is an area in which the operating room personnel are particularly careful because of its importance, or it may be that breaks in asepsis are so common that they are not regarded as threats to the safety of patients. Also, the majority of incidents reported relating to asepsis indicated non-nursing personnel were responsible. Perhaps operating room nurses saw errors made by others and overlooked their own, or perhaps special in-service education is needed for teaching the non-nurse employee. The student should be so taught that she will be able to apply the principles of asepsis to her activities and to recognize errors she may make in aseptic technique. This "surgical conscience" becomes a part of her, not just as a student of nursing but as a future professional nurse, and only when this is accomplished will she be able to recognize errors in the technique of others.

Only one incident was reported of the psychological type mentioned by McClain.² It may be that the wording on the incident report form used in this study for gathering incidents did not encourage reporting of incidents relating to psychological trauma; or perhaps operating room personnel need to be more aware of the effect of surgical routines on the mind and feeling of the patient. Somehow it is easier to recognize physical accident than psychological. Further incidents need identification to help students gain appreciation for the person of the patient while in the often impersonal atmosphere of the operating room.

Reference was made earlier to Yoder's statement in which he gave three main causes of accidents: unsafe working conditions, unsafe manner of conducting business and employment of incompetent workers.³ The incidents that were reviewed in this study were examined to see to what extent they might fit into this classification. While the information received about the contributing factors causing the incidents was not explicit enough to make deductions about them, an attempt was made to classify them according to Yoder's

² Esther McClain and Shirley Hawke Gragg, Scientific Principles in Nursing, Third edition, St. Louis: The C. V. Mosby Company, 1958, p. 50.

³ Dale Yoder, Personnel Management and Industrial Relations, New York: Prentice-Hall, Inc., 1943, p. 482.

categories. It would seem the largest number of incidents might have been caused by unsafe ways of working. About fifty per cent of those classified in the major areas seemed to have been caused by either carelessness or negligence; it was difficult to separate these causes. About fifteen per cent were caused by poor communication or poor interpersonal relationships between doctors and nurses.

Unsafe conditions accounted for about twenty per cent of the accidents. These included such factors as management seeming not to recognize need for new equipment and for safe maintenance of equipment. Only five of the participants indicated lack of time might have been the cause of accidents. However, this might have been a reason behind some of the incidents seemingly caused by negligence and carelessness.

About ten per cent of the incidents were caused by incompetent workers or by improper supervision of new personnel. It is possible some of the incidents caused by carelessness might have been caused by incompetent personnel.

It would seem that in an area of nursing where precision and exactness is so important as in the operating room that the way in which the operating room is managed needs to be restudied. Perhaps many of the incidents were caused by tension and pressures rather than outright carelessness or negligence. It is possible that pressures of time, of

scheduling, of emotions, of interpersonal relationships, of health, need to be reduced to encourage fewer incidents relating to threat to patient safety.

Perhaps more emphasis needs to be placed on reasons for rules or directives for safety. Thus personnel--and students-- could do more problem solving to apply principles to specific situations rather than trying to live and work by rules which do not cover all situations. Perhaps this too might relieve tensions. It was noted that some participants suggested that certain rules should be stated and "strictly enforced," or that a certain incident was "inexcusable." While there might be a place for "strict enforcement" and "inexcusable behavior" it seems unfortunate that such should be necessary for professional personnel who are working together to maintain life in the operating room. It may be this approach itself could cause unnecessary tension and be a means of causing incidents which threaten patient safety. For it is only as the environment of the student is controlled and made free of undesirable tensions that students are enabled to learn effectively.

IX. SUMMARY

The incidents received through the use of the critical incident technique were classified according to the nature of

the instance. Seven groups were formed and discussed in the order of their frequency.

The first group of incidents discussed were the twenty-five which came under the heading of supplies or those smaller items such as sponges and needles used in operating room nursing. Eighteen incidents involving equipment--those larger items used in caring for the patient in the operating room--made up the second group.

Incidents occurring during transportation and anesthesia accounted for fifteen in each category. Twelve incidents related to asepsis and twelve were concerned with identification. The last classification included those incidents pertinent to the preparation of the patient for surgery.

A brief summary of the contributing factors which related to the incidents was included in the discussion.

It was doubtful that the 100 incidents classified illustrated all aspects of safety for teaching purposes. Some possible suggestions were given by which improved conditions in the operating room could reduce the number of incidents that occur.

A brief interpretation was given concerning (1) the use of the incidents in teaching concepts of patient safety and (2) the nature of incidents and the factors contributing to the incident.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

I. SUMMARY

This study was conducted in an attempt to identify incidents threatening the safety of patients in the care of operating room personnel and to classify them for use in teaching safety. It was planned that the findings would contribute to the teaching of concepts of patient safety for students of operating room nursing through the use of vicarious experiences.

Literature was reviewed to (1) survey established concepts of safety and (2) find ways in which safety hazards and accidents have been classified particularly as they relate to hospital safety involving patients. The general concepts of safety identified expressed the need for safe working conditions and for personnel to have an attitude of safety as well as sufficient knowledge and skills. Safety included freedom from mechanical, thermal, chemical, bacteriological, and psychological injury.

The descriptive method of research was used. Incidents were gathered through the use of the critical incident

technique in an attempt to locate unexpected possible sources of accidents or near-accidents.

A list of the 72 state accredited schools of nursing in Illinois was obtained and letters asking for participation in the study were sent to the directors of nurses and to the operating room supervisors and clinical instructors in these institutions. Fifty, or 76 per cent of the supervisors and instructors replied.

One hundred usable incidents were reported on incident report forms designed for use in this study. Participants describing incidents included factors which contributed to the occurrence of the incident and gave suggestion as to how they thought the incident might have been prevented.

The incidents received were classified according to their nature and under headings applicable to teaching. Almost one-half of the incidents described pertained to the use of supplies and equipment. Those incidents threatening patients which occurred during transportation and during anesthesia made up a little more than one quarter of the total number. Another fourth included those incidents which were related to asepsis and identification. Very few incidents were concerned with the preparation of the patient for surgery.

II. CONCLUSIONS

This study was based on the assumption that accidents occurred in the operating room that threatened the safety of patients other than the commonly discussed accidents of fires and explosions. This assumption has been further validated by the fact that 39 operating room personnel reported 100 incidents that threatened patient safety in their operating rooms.

Analysis of the incidents revealed that the majority of incidents or near-accidents could have been prevented by improved ways of working.

All but one of the incidents were of a physical nature. One only was related to trauma to the psyche.

III. RECOMMENDATIONS

The following recommendations were made:

1. That a similar study be conducted perhaps to gather all incidents threatening patient safety that occurred within a selected period of time to find out to what degree the incidents gathered in this study are illustrative of operating room hazards which threaten patient safety.

2. That a similar study be conducted to identify incidents that threaten the safety of personnel employed in the operating room.

3. That a similar study be conducted at a future time to find out to what extent hazards have changed. It would be expected that present illustrations would be inadequate as technological advances are made.

4. That a study be conducted to find out what patients' psychological reactions are to the operating room environment.

5. That more emphasis on the human factor in teaching students--and in in-service education--is needed; that operating room personnel will be more sensitive to psychologically traumatic incidents and the need to allay unnecessary fear.

6. That the incidents identified and classified in this study be used to illustrate teaching concepts of safety for patients in the care of operating room personnel.

7. That these incidents be used as problem situations rather than mere illustrations of rules or directives, to encourage greater student involvement, independent thinking and problem solving.

PART II

THE INCIDENTS

PART II

THE INCIDENTS

In Part I of the study was shown how incidents which threaten the safety of patients in the care of operating room personnel were identified and classified. In Part II of the study the incidents have been tabulated so that the incidents, factors which contributed to their occurrence, and directives for accident prevention, can be seen at a glance. This has been done to facilitate the use of the incidents for teaching purposes.

Where incidents were much alike they were not repeated. The contributing factors which were given by the participants were not edited. Where different contributing factors were given for similar incidents they were listed together.

Directives have been developed within each main category. One directive may represent several types of incidents within the category. Likewise, one incident may have suggested more than one directive. No attempt has been made to match the directives with the incidents other than to include all directives within a given category which are pertinent to the particular incidents.

INCIDENTS AND THEIR CONTRIBUTING FACTORS WHICH ILLUSTRATE
DIRECTIVES FOR SAFETY OF THE PATIENT IN THE CARE OF
OPERATING ROOM PERSONNEL

A. INCIDENTS PERTAINING TO THE USE OF SUPPLIES

Incident	Contributing Factor	Directives for Safety
<u>Sponges</u>		
A sponge count was reported incorrect when peritoneum was closed. Patient was x-rayed and sponge was recovered.	Negligent handling of sponges.	X-ray when sponges are missing. A sponge count should be taken in all operations where the depth and location of the wound is such that a sponge could be accidentally lost or left in the wound.
Two neurological sponges were left in a wound.	A neuro surgeon refused to have sponges counted because all sponges were taped.	Sponges should be checked frequently when many are used.
A sponge was left intraperitoneally during a vaginal hysterectomy.	Two types of sponges were used and the surgeon did not allow time for the sponge count.	All sponges should be counted by two people, one of whom should be a nurse.
4x4 (radio-opaque) sponge was not accounted for in a vaginal excision of cervix. Surgeon reluctantly agreed to an x-ray which proved positive and the sponge was removed with difficulty.	Sponge count not taken before closure of wound was begun. Surgeon felt the count was unnecessary.	The nurse counting sponges should be alert--not preoccupied.
One month following a vaginal hysterectomy the doctor found a sponge in vagina. Sponge count was reported on chart to be correct	Sponge count was taken before and after peritoneum was closed. No count was made during the colporrhaphy.	There should be no interruption in the sponge count. Record wrong sponge counts even if the sponge is located by x-ray. This shows value of the count.

Incident	Contributing Factor	Directives for Safety
There were incorrect sponge counts on laporotomies.	An additional sponge was needed to wipe off excess prep solution and it was taken from the counted sponges. New Personnel.	Sponges should not be counted out loud, but the count should be compared by the two who are counting and recorded for reference.
3x3 sponges lost during operation.	Outside attraction during first sponge count.	Sponges should be counted four times--before sterilization, when setting up for surgery, before the body cavity is closed, and again before the patient is moved from the table.
The surgeon requested a sponge for vaginal packing and was given a regular sponge instead of a radio-opaque sponge.	New nurse misunderstood request. Surgeon did not specify type of sponge required.	Sponges used in the operative field should be x-ray detectable.
When counting sponges a nurse caught herself counting automatically. She did not remember counting.	Nurse was pre-occupied or overly busy and had to count sponges hurriedly.	Sponges used for "preps" should be different in size and quality from those sponges used during surgery. "Prep" sponges should be removed from the room before the incision is made.
<u>Needles</u>		
On a routine x-ray several years following abdominal surgery, a needle was found in the abdomen. This was reported to the operating room supervisor.	Atraumatic needles had not been counted at the time of surgery.	The nurse should account for each needle the surgeon uses. She should be sure she gets it back before giving him another.

Incident	Contributing Factor	Directives for Safety
A needle was missing at the end of the operation. The abdomen was x-rayed but the needle was not located.	The nurse did not check needle holders for needles when returned by the surgeon.	All parts of a broken needle must be accounted for.
Atraumatic needle was missing when the final count was taken.	Tubes of suture were counted rather than the needles. One tube contained standard rather than atraumatic suture.	Needles should be confined to some special area and not permitted to lie on the table or the operative field. The scrubbed nurse should identify each needle and know how it is used.
Student was stuck with a needle which was discarded.	Carelessness in handling needle.	Needles incorrectly grasped in the holder could cause the needle to break.
During a crucial moment in a thyroid operation, the surgeon was given a needle.	Student was scrubbed alone without adequate supervision.	Any needle perforating a glove is contaminated and should be discarded.
A suture needle broke and one part was missing.	Needles were incorrectly placed in the needle holders.	All suture taken from glass tubes should be rinsed to be sure there are no particles of glass adhering to it.
When breaking suture tubes, the glass shattered and small pieces adhered to the suture.	Improper handling of suture tubes.	
<u>Instruments</u>		
A patient incurred urethral burn because surgeon inserted urethral sound that had just been sterilized.	The surgeon took the sound from the scrub nurse and used it even though she told him it was hot.	Instruments should be always handed to the surgeon ready for use.

Incident	Contributing Factor	Directives for Safety
<p>Hot instruments were placed on scrub table. Could have been used on patient and caused a burn.</p>	<p>Two operations running close together needed same instruments. Insufficient time allowed for cooling of heavy instruments.</p>	<p>All instruments must be checked for completeness and efficiency before they are used in the operation.</p>
<p>The instrument nurse handed a hot instrument to the surgeon who used it for clamping off a bleeder. The patient was burned.</p>	<p>More hemostats were needed and they were taken direct from the autoclave and used without cooling.</p>	
<p>Following abdominal surgery the bolt from the Balfour Self-retaining abdominal retractor was found on the floor.</p>	<p>The bolt which had been loosened for sterilizing purposes had not been tightened.</p>	
<p><u>Other Supplies</u></p>		
<p>During chest surgery the surgeon had to close rapidly because of the poor condition of the patient and the chest tubes needed were not available.</p>	<p>The nurse who set up for the operation did not have everything in readiness.</p>	<p>Necessary supplies should be available and sterile.</p>

B. INCIDENTS PERTAINING TO THE USE OF EQUIPMENT

Incident	Contributing Factor	Directives for Safety
<u>Equipment for Positioning the Patient for Surgery</u>		
As the incision was made, the patient put his hand into the wound.	The patient was under light anesthesia and his arms were not restrained	The patient for surgery should have his arms in restraints to prevent them from being injured and to keep his hands from getting into the operative field.
While the patient was being placed into or taken out of lithotomy position the toes hit the metal stirrup or were entangled in the covers. Examination revealed a fractured toe.	Haste and assistance by personnel unfamiliar with the equipment.	Brachial paralysis injury is caused by many factors in the incorrect positioning of the patient.
A patient developed paralysis of brachial plexus, following pelvic surgery on a thin woman.	Shoulder braces carelessly placed for trendelenberg position.	The use of all table attachments should be understood and care should be exercised in the use of each.
Armboard frequently falls off table when in use. Could injure the shoulder.	Carelessness or lack of knowledge of correct placement of armboard.	All operating room personnel should know how to operate the table.
Patient for vaginal surgery was moved from the cart to the table. The foot of the table dropped and patient almost fell on the floor but was caught by the nurse.	Operating table was old and had not been checked to see that locks were secured.	Personnel should be instructed in the proper use of equipment and potential dangers involved in its use.

Incident	Contributing Factor	Directives for Safety
<u>Equipment that Caused Burns</u>		
Patient was burned by the indifferent electrode.	Short in the mechanism. Faulty contact with patient's skin. Plate sparingly lubricated. Loose wire in the connection. Insulation for cord worn off at point of attachment to indifferent electrode.	All electrical equipment should be grounded properly to prevent accidental burns. The indifferent electrode should be properly placed avoiding hairy or scarred tissue.
Hot flask of sterile water dropped from specially designed carrier. Flask broke; burning the nurse. Could have burned patient or contaminated the sterile area.	Carrier was inadequate support for the flask.	Lubricating jelly used to cover the indifferent electrode should be used according to direction of the manufacturer. All cords should be checked for faulty connections. Solutions used during the operation should be kept at body temperature.
<u>General Equipment</u>		
During the removal of a cast the leg was lacerated.	Insufficient padding.	The use of potentially dangerous equipment should be with extreme precaution under proper direction.
Patient developed a laryngeal spasm and there was no resuscitator available in the operating room.	Resuscitator was stored in the emergency room or basement.	Equipment that might be needed for an emergency should be kept close at hand.

Incident	Contributing Factor	Directives for Safety
<p>Cystoscopy instrument cabinet was not installed properly and the sterilization was questionable. Switch was defective.</p>	<p>Personnel are dependent upon quality and proper installation.</p>	<p>All equipment should be maintained in proper working condition by periodic checking to assure that it is free from defects.</p>
<p>Switches on the cysto table not working. While the patient was in position fumes and smoke were noted.</p>	<p>Defective equipment supplied by the company.</p>	<p>When electrical equipment is used the cords should be kept away from traffic areas.</p>
<p>Operating room table tipped allowing patient to fall on the floor.</p>	<p>Faulty old equipment.</p>	<p>Utensils and other equipment should be handled quietly as noise can be disturbing to the patient.</p>
<p>During operation the circulating nurse with arms full of glass jars tripped over electric cord and fell.</p>	<p>Hurry and electrical cords to equipment lying on the floor.</p>	
<p>Utensils dropped while being carried out from the room. This frightened patient under local anesthesia with the result that she jumped.</p>	<p>Nurse did not use the table provided. Noise startles people so that they cannot control their actions.</p>	

C. INCIDENTS OCCURRING DURING ANESTHESIA

Incident	Contributing Factor	Directive for Safety
<u>Preparation for Anesthesia</u>		
Circulating nurse left room at the time incision was made. Incomplete anesthesia could have resulted in a crisis.	Lack of thought on the part of circulating nurse. Need of additional supplies diverted her attention.	The chart should be checked to see that the preanesthetic medication has been given and recorded.
Patient started into the excitement stage and nearly fell from the table.	No personnel in attendance of patient during induction. Restraints had not been placed over patient's legs.	The circulating nurse should remain with the patient during the induction to protect him from harm.
Baby was on the operating table with the knee strap secured and a blanket over the baby. Circulating nurse stepped a few feet from table and baby fell to the floor.	The anesthetist and circulating nurse each thought the other was watching the baby.	The total preparation of solutions should be the responsibility of one person.
Patient under local anesthesia complained of severe pain. It was discovered that the novocaine prepared by the hospital was only water.	The person responsible for preparation and sterilization of procaine had relied on someone else to add the crystals to the flasks of water. This was not done.	
Scrub nurse added one cc of adrenalin to local anesthetic agent instead	Lack of application of dosage by the nurse who was rather rushed in preparing	

Incident	Contributing Factor	Directive for Safety
<p>of iii gtts as ordered. The error was discovered by the surgeon in re-checking the dosage.</p>	<p>for the operation.</p>	
<p>A sponge saturated with aromatic spirits of ammonia was placed beside the face of a child following a tonsillectomy. The child was lying prone and the sponge got under the face producing a severe burn before it was noticed.</p>	<p>No thought was given to the possibility of the burn from the medication.</p>	<p>Medicated sponges when used should not be left beside an unconscious or irresponsible patient.</p>
<p><u>Explosions and Fires</u></p>		
<p>Surgeons concealing lighted cigarette while in the operating room corridor or at the door while talking to a surgeon who was operating.</p>	<p>Surgeon believed that the rule was "silly" because there had been no burns or accidents in their operating room.</p>	<p>Any open flame should be prohibited in a hazardous area.</p> <p>Flammable agents should not be used for preparing the skin when cautery is used.</p>
<p>Fire occurred when cautery was used.</p>	<p>Excessive antiseptic solution was on the indifferent electrode plate. Nurse was inexperienced.</p>	<p>Conductive shoes should be worn by all personnel in the operating room who work in a hazardous area. Shoes should be tested for conductivity and the results of the test recorded.</p>
<p>The surgeon asked for an alcohol sponge while using cautery.</p>	<p>Alcohol is flammable.</p>	
<p>During cesarean section the nurse</p>	<p>Nurse from maternity was not wearing</p>	

Incident	Contributing Factor	Directive for Safety
from maternity caused a spark in the operating room.	conductive soled shoes	
Explosion occurred in the operating room.	Personnel not wearing conductive shoes.	
Anesthetist pumped the bag when using a semi-closed system forced gases into the room presenting a hazard of explosion.	Use of semi-closed system--need to pump breathing bag.	
Anesthetist's helper went to adjust overhead light and sparks occurred when he touched it.	Person involved was not wearing conductive shoes.	

D. INCIDENTS OCCURRING DURING TRANSPORTATION

Falls

Patient fell from stretcher when the wheel caught in the space between elevator and door.

Stretcher without siderails tipped.

When moving the patient from the bed to the stretcher, sufficient help should be available.

Patient fell between operating table and the stretcher.

In the split-second in which the orderly reached for the restraint the patient fell.

When moving the patient from the stretcher to the table or bed, both pieces of equipment should be stabilized by locking the wheels or by personnel.

Incident	Contributing Factor	Directive for Safety
When using Davis patient roller to move the patient to operating table, stretcher moved away and patient slipped between table and the stretcher.	Stretcher was not stabilized.	The patient should be strapped to the stretcher to prevent falls, especially if sedated.
Patient who had general abdominal surgery fell from recovery cart shortly after surgery.	Side rails were not placed on cart in operating room. Insufficient personnel.	Care should be taken to prevent injury, to minimize trauma jerking and bumping when transporting the patient to and from the operating room.
Patient turning on stretcher.	Patient unattended and without restraint.	The stretcher patient should never be left unattended or without the safeguard of restraints being fastened.
Transferring patient from stretcher to bed.	Lack of personnel to help with the transfer.	The patient should be placed on the stretcher properly so that he can be put into shock position if needed.
Patient nearly fell when transferred between stretcher and operating room table.	Stretcher not supported against table. Student and aide were standing on the wrong side of table.	
<u>Other than Falls</u>		
Patient suffered slight injury to arm from having it brushed against the doorway when being transported to operating room.	Carelessness of person in transporting the patient.	All persons who transport patients should have thorough instructions and understanding in the care of the stretcher patient.

Incident	Contributing Factor	Directive for Safety
Anesthesia was started without the patient having had a pre-operative medication.	Chart was not checked by ward or operating room personnel. Schedule running late and personnel rushed.	If the anesthesia policy does not permit the wearing of dentures and the patient arrives in the operating room wearing them, the dentures should be removed in surgery, labelled and returned with the patient to the ward.
Patient for general anesthesia came to surgery wearing dentures.	Dentures had been removed but left at bedside and the patient replaced them.	The anesthetist or a staff nurse should accompany the patient from the operating room to the recovery room.
Patient on recovery stretcher backwards.	Operating room personnel did not check for head end of stretcher.	
Anesthetized patient left unattended and could fall or aspirate.	Intern transporting the patient, momentarily left patient unattended.	
Anesthetized patient arrived on the ward cyanotic.	Airway out of place, transportation being done by untrained personnel.	

E. INCIDENTS RELATED TO ASEPSIS

Attaining Sterility

<p>Wrapped instruments were unsterile. This was discovered when another package with an indicator showed to be unsterile as were other articles.</p>	<p>No indicator either on inside or outside of wrapped instruments. Time clock had been read incorrectly and the autoclave was opened early.</p>	<p>All articles used in an operation must be sterilized.</p>
		<p>A system for handling supplies should be developed and adhered to whereby sterile and unsterile supplies are kept separate.</p>

Incident	Contributing Factor	Directive for Safety
<p>Splash basins were found to be unsterile. This was shown by pressure sensitive tape.</p>	<p>Unknown. Probably carelessness on the part of the person autoclaving.</p>	<p>If in doubt of the sterility of an article it should be considered unsterile and not used.</p>
<p>During the operation the nurse passed instruments behind the surgeon's back several times before covering his back with a towel.</p>	<p>The position of the assistant was such that the nurse could not pass instruments in any other way.</p>	<p>The temperature recording chart should be checked daily by the operating room supervisor or the head nurse.</p>
<p>Surgeons walking into the operating room with street clothes.</p>	<p>Surgeon was late and wanted to see the patient before patient was put to sleep.</p>	<p>The back of the gown should be considered contaminated.</p>
<p>Person who delivers daily linen is chief "houseman" and as such is responsible for burning trash, etc. Wears the same clothing all day.</p>	<p>Lack of understanding on the part of administration and lack of communications on the part of the supervisor.</p>	<p>All bacteria cannot be eliminated but should be kept at an irreducible minimum.</p>
<p><u>Maintaining Sterility</u></p>		<p>Specific rules should be made and enforced regulating the traffic in the operating room in order to minimize the introduction of air-borne infection. This should eliminate personnel in street clothes.</p>
<p>Wound infection.</p>	<p>Contamination, break in aseptic technic, contaminated air in the room.</p>	<p>Contaminated linen should be placed in a bag marked "Contaminated" and sent to the laundry immediately.</p>
<p>Contaminated linen kept in operating room suite until it could be picked up.</p>	<p>Heavy schedule preventing taking linen to laundry immediately.</p>	
<p>Dust fell from light track onto drape.</p>	<p>Light was moved on track dislodging dust.</p>	

Incident	Contributing Factor	Directive for Safety
Maintenance men were found changing filters on sterile water tanks and running unsterile water to test the filter.	Maintenance men were not intercepted. Secretary was called away momentarily.	Maintenance work should be done at specific times arranged for by the supervisors of the departments at a time when surgery is not in progress.
Dust from air conditioners in operating room.	Dirty filters in the air conditioners.	Housekeeping must be done thoroughly.

F. INCIDENTS CONCERNED WITH IDENTIFICATION

Identification of the Patient

Two children scheduled for T and A's at the same hour were taken to wrong rooms. One child operated on by the wrong doctor before mistake was discovered.

Patient for surgery put in the wrong room.

Patient lost identification tags placed on the hand.

New orderly delivered the patients to the operating room.

Two patients for same type of operation at the same hour. New student put the patient in the wrong operating room.

Adhesive of tag made ineffective by perspiration.

The patient should be labeled in some way so that identification is assured.

The operating room nurse should check the identification label of the patient with the name listed on the operating room schedule which is adjusted as changes are made.

The nurse responsible for the operating room should have the surgeon identify the patient before the operation is begun.

Incident	Contributing Factor	Directive for Safety
The wrong patient was brought to the operating room.	No identification of patient made by new personnel.	The use of an operating room call slip which identifies the patient can help to prevent mistakes in identity.
In identifying patient admitted to the operating room it was found the right patient had been brought to the operating room with the wrong chart.	Chart picked up by room number only and not checked by patient's name.	
<u>Identification of the Operative Site</u>		
A child was anesthetized to have hand surgery when a surgeon came in prepared to do a T. and A. The anesthetist convinced the doctor it was not his patient.	Surgery in this room was running late and the surgeon did not identify the patient.	The operative site should be verified by a professional member of the operating team.
<u>Identification of Medications</u>		
A bilateral herniorrhaphy was being performed under local anesthesia. Second side was injected with hydrogen peroxide instead of procaine.	Circulating nurse who supplies medications and solutions had poured hydrogen peroxide (for cleaning skin) into the same type of medicine cup as used for procaine.	When more than one solution is poured, each cup of solution must be identified.
Wrong type of medication was used for injection purposes. Alcohol was	Personnel careless in identifying medications on the same table. More than one	All labels should be correct.
		The name and dosage of the medication should be stated as it is handed to the surgeon for administration.

Incident	Contributing Factor	Directive for Safety
<p>injected instead of procaine.</p> <p>Patient for a local tonsillectomy had the throat sprayed with a mixture of pontocaine and formalin.</p>	<p>unlabeled solution on the table.</p> <p>The doctor filled the atomizer from a pontocaine bottle with an old pontocaine label on it. This actually was an old bottle being used as a specimen bottle.</p>	<p>Two professional workers should check the labels on blood with the cross matching sheet on the patient's chart and with the patient's identification.</p>
<p>A pint of type A/ blood given to patient with a type A- blood. The mistake was discovered several days later when patient went to pay the bill and was charged for a pint of blood which she had never received.</p>	<p>Both patients were for hysterectomy, one a vaginal and the other an abdominal. Surgeons' surnames were the same. Laboratory was "called" for blood.</p>	

G. INCIDENTS CONCERNED WITH PATIENT PREPARATION FOR SURGERY

<p>Patient was admitted to the operating room, the surgery postponed because the husband had not been asked to sign necessary permit required for surgery. The operating room staff was unable to contact the husband.</p>	<p>No preparation check list on chart. New Personnel on the ward.</p>	<p>A check list stipulating the types of permits and required signatures could be helpful in preventing errors that could cause delay or improperly authorized operations.</p>
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Incident	Contributing Factor	Directive for Safety
<p>Skin of perineum and thighs of patient irritated and sore following perineal surgery.</p>	<p>Sensitivity of patient to the preparation solution.</p>	<p>All excess "prep" solution should be removed before the patient is draped for the operation.</p>
<p>The surgical "prep" had to be done on the table after the patient was under anesthesia.</p>	<p>Night nurse was too busy to do the "prep" and had neglected to report the problem.</p>	<p>All preliminary skin "preps" should be done according to the routine of the hospital. When they are done before the patient is under anesthesia the amount of anesthesia is lessened.</p>

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APPENDICES

APPENDIX A

FORMS USED FOR GATHERING INCIDENTS

1. Letter to the Director
2. Incident Report Form
3. Return Postal Card for use by the Director
4. Follow-up Card Sent to the Director
5. Letter to the Operating Room Supervisor and Clinical
Instructor
6. Follow-up Card Sent to Operating Room Supervisors
and Clinical Instructors

10763 Poplar St.
Loma Linda, Calif.
Feb. 6, 1959

Dear Director:

In the mid-west there is much emphasis being placed on the prevention of explosions and fires in the operating room. Those of us who work in this area of nursing know that there are other hazards that threaten patients, which if identified could be used for teaching safety and prevention. As an operating room supervisor and clinical instructor in Hinsdale, Illinois I am interested in providing safety for patients who are in the care of operating room personnel. For this reason incidents which have occurred to patients in care of operating room personnel are being gathered from teaching hospitals in Illinois.

I am writing to ask your permission to contact your operating room supervisor and operating room clinical instructor whose help I need in this study. A copy of the incident report blank to be used is enclosed; also a self-addressed card for your convenience in sending me the names of these nurses. It will take about 20-30 minutes to complete the incident report blanks I will send to them. Of course names and institutions will not be mentioned in the study.

This data is being gathered as part of a project to meet the requirements for the master of science degree at the College of Medical Evangelists and I hope it will be of benefit to operating room personnel, particularly those responsible for teaching. A copy of the summary of the findings will be sent to you if you wish.

Your participation in this project is greatly appreciated.

Sincerely,

Elsie D. V. Wendth, R.N.

EDVW:am
Enc.

OPERATING ROOM SUPERVISORS AND CLINICAL INSTRUCTORS

Briefly describe four (4) recently observed or reported incidents threatening the safety of the patient who was in the care of operating room personnel. Provision has been made for reporting the requested four specific incidents (preferably of different types.) However, if you have had additional incidents, a report of these will be appreciated. Thank you for your cooperation.

1. a. Describe the incident that occurred.

- b. What factors contributed to the occurrence of the incident?

- c. How might this incident have been prevented?

2. a. Describe the incident that occurred.

- b. What factors contributed to the occurrence of the incident?

- c. How might this incident have been prevented?

Please return to
Elsie D. V. Wendth
10763 Poplar Street
Loma Linda, California

(next page please)

3. a. Describe the incident that occurred.

b. What factors contributed to the occurrence of the incident?

c. How might this incident have been prevented?

4. a. Describe the incident that occurred.

b. What factors contributed to the occurrence of the incident?

c. How might this incident have been prevented?

Please return to:
Elsie D. V. Wendth
10763 Poplar Street
Loma Linda, California

RETURN POSTAL CARD FOR USE BY THE DIRECTOR

The following names are those you requested:

Operating room supervisor _____

Operating room clinical instructor _____

I would _____ like to have a summary of the study

I would not _____

Signed _____

(Name of hospital typed in)

FOLLOW-UP CARD SENT TO THE DIRECTOR

Dear Director:

Two weeks ago I sent you a letter asking for your cooperation in a study I am conducting to identify incidents that threaten the safety of the patient in the care of operating room personnel. Perhaps you did not receive this.

I am wondering if it would be possible for you to send me the names of your operating room supervisor and clinical instructor to whom I might send an incident report blank. If it is possible for these people to participate in this study, will you please send their names on the attached card?

Thank you very much,

Elsie D. V. Wendth

The following names are those you requested:

Operating room supervisor _____

Operating room clinical instructor _____

I would _____ like to have a summary of the study

I would not _____

Signed _____

10763 Poplar Street
Loma Linda, Calif.

Dear

Some of us in operating room supervision and instruction in the mid-west have felt that there is a need to identify hazards in the operating room in addition to those concerned with fires and explosions. I am conducting a study to do just this in the hope that the findings will be useful in teaching safety and prevention.

Your director has given me permission to ask you for help in conducting this study. I realize that you are terribly busy, but you are in an unusually good situation to supply the information needed for this study. The enclosed form can be completed within 20-30 minutes and of course, all information received will be held in strict confidence.

Please return the completed form in the enclosed stamped, self-addressed envelope. Your immediate help in this study is greatly appreciated.

Sincerely,

EDVW:am
Enc.

FOLLOW-UP CARD SENT TO THE OPERATING ROOM SUPERVISORS
AND CLINICAL INSTRUCTORS

Dear Supervisor and Instructor:

Two weeks ago I sent you a letter asking for your cooperation in a study I am conducting to identify incidents that threaten the safety of the patient in the care of operating room personnel.

Perhaps you have already sent the incident report blank to me. If so, kindly disregard this card. However, if you have not, I surely would appreciate it if you could send it to me immediately. Your participation is needed in this study.

Thank you so very much,

Elsie D. V. Wendth
10763 Poplar Street
Loma Linda, California

APPENDIX B

PREVENTIVE MEASURES WHICH STUDY PARTICIPANTS INDICATED
MIGHT HAVE PREVENTED STATED INCIDENTS

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MIGHT HAVE PREVENTED STATED INCIDENTS

A. Preventive Measures Pertaining to the Use of Supplies

1. Sponges

A more careful count of all free sponges.

Insist that all sponges, regardless of type, be counted. Have strict rules set up by a committee.

Four by four sponges should have been used from the very beginning. More attention should be paid to sponges laid in the operative area and left there for a short period. Surgeon should have allowed sufficient time for the sponge count.

Nursing personnel could have been more observant and called for a count earlier. Cooperation from surgeons in calling for a sponge count before closure and in the discarding of sponges used so they can be collected for a count.

Counting sponges earlier in procedure.

Take two counts, before and after the peritoneum is closed. Account for all the sponges again before the patient leaves the operating room table.

Circulating nurse could have checked the prep table more carefully before discarding sponges. She had used a counted sponge to wipe excess solution from area which should not have been necessary as plain uncounted sponges were available.

Giving careful attention or strict attention to the counting of the sponges before the operation started.

More emphasis on importance of sponge count and closer correlation between graduate and student in operating room when instructor is not available.

Doctor should have specified the kind of sponge he needed since radio-opaque sponges are counted and regular four by four's used for wipes are not.

Keep track of sponges used by marking down on record the number of packs opened and again when recounted at the end of surgery.

2. Needles

Counting of atraumatic needles.

Another needle should not be passed to the surgeon before the one in use is located by the scrub nurse. Needles should always be attached securely in a suture towel or on a needle holder so they will not be brushed off the sterile towel.

The circulating nurse should watch closely as she takes tubes from the suture jar to make sure they contain needles. Scrub nurse and circulating nurse must check to be sure that the atraumatic tubes of suture are labeled correctly and the number taken recorded.

Stress in staff education the necessity of having accurate needle counts. Change procedure so that both scrub nurse and circulating nurse must count added atraumatic needles. The circulating nurse must record the addition immediately.

Student should have graduate nurse scrub with her, or if this is not possible, the graduate nurse should be in the room and should check all needles used before they are given to the doctor.

Place needle properly in needle holder.

3. Instruments

Should have been checked before surgery and again before retractor was handed to the doctor.

Nurse should have insisted that the urethral sound be cooled.

Instruments should have been sent out as soon as finished, from the first case to be autoclaved--or a new set ordered.

If it is necessary to sterilize more instruments, they should be cooled before giving them to the surgeon.

4. Other Supplies

Adequate preparation on part of nurse. Set of chest tubes kept sterile for emergency use.

Better technique and better wrapping of suture tube before breaking.

B. Preventive Measures Pertaining to the Use of Equipment

1. Equipment for Positioning the Patient for Surgery

Having the respirator on hand at all times.

Convenient placement of emergency equipment. Frequent inservice meetings which would deal with the efficient use of emergency equipment for all operating room personnel.

Need emergency switch to turn off motor and electricity.

Abandon the policy of making old equipment 'do.'
Insist that old equipment be removed from the operating room.

The operating room nurse should take sufficient time to perform all of her duties and at all times be aware of existing hazards.

The nurse should encourage the surgeon to use more padding under casts.

The nurse could have used the proper equipment or else she should have carried fewer utensils.

2. Equipment That Caused Burns

Check equipment before use to see it is in perfect working order.

Proper placement of the indifferent electrode. It should not be applied to a hairy surface or to skin extensively scarred.

Thoroughly checking the equipment before using.
Application of more electrode paste.

All equipment should be closely inspected to detect any faulty areas. Faulty equipment should not be used. Proper reporting of the improperly functioning equipment and removing it from use until it has been repaired.

Obtain a better carrier or a better method to transfer hot water.

3. General Equipment

Careful handling of patients as they are being positioned.

Shoulder braces placed on outer part of the shoulder, over the area away from the neck and checked often during the procedure. Trendelenburg position not more severe than 45'. Pad the area if procedure is going to involve a considerable length of time.

Care in placing armboard on the table so that the latch will catch.

If nurse had checked the table before putting the patient on the table this would have been prevented.

C. Preventive Measures Pertaining to Incidents Which Occurred During Anesthesia

1. Preparation for Anesthesia

Adequate help for amount of surgery to be done. Continuous education so that nurse does not neglect the patient. Human interest in the patient is important.

See that the patients are well secured before starting general anesthesia.

Use effective wrist and arm restraints.

Regardless of the other needs of the department or room, the place of priority for the nurse should be beside the patient during induction. This is a "must" regardless of the type of induction.

At all times there should be an educated and reliable person responsible for the patient while in the

operating room. This responsibility should be so delegated that no confusion or misunderstanding could ever happen.

Eliminating the use of aromatic spirits of ammonia sponges before the patient has reacted from the anesthetic.

Only one person should be responsible for filling bottles with both the distilled water and novocaine. If the distilled water is not on hand, concentrated novocaine crystals should be placed next to the empty bottle marked as such to indicate that it must be added before sterilization.

Strict observation of the usual ways in administration of medications on the part of every member involved in applying the medication--the scrub nurse, circulating nurse and surgeon.

More conscientious attitude by nursing personnel regarding pre-operative preparation. Improved scheduling methods to prevent operating room personnel from feeling obligated to hurry.

2. Explosions and Fires

Strict regulations enforcing the wearing of conductive shoes by each person in the department REGARDLESS.

All people in operating room wearing conductive shoes, equipment and floors conductive and more consideration in not touching anesthesia machines.

Use of different system--closed--by the anesthetists.

Proper instruction to new personnel in operating room apparel and safety measures.

Doctors dressing room outside the department and strict enforcement of rules by Safety Committee.

Better staff education so the staff is familiar with all operating room equipment.

Operating room nurses should adhere to rules of the operating room at all times and one is that alcohol is not used as a disinfectant where the cautery is being used.

D. Preventive Measures Pertaining to Transportation

1. Falls

Use Hausted type of stretcher.

Proper orientation to execution of duties. More close supervision.

Alertness of personnel at time of patient's return to ward. Patiently waiting for personnel to assemble.

Strapping the patient on the cart and securing additional help such as aides when transporting patients.

When it is observed that personnel leave the patients after examination without replacing the protective straps it is suggested that they observe the regulation that all patients be restrained while in the operating room. Inservice education on the replacing of protective straps immediately upon completion of examination.

Restraints on all surgical carts.

Sufficient help so persons will be available to stay with patients.

Although careful instruction was given in the use of the Davis-patient roller, repeated return demonstrations and observation is necessary until use is firmly implanted in the minds of all personnel.

If the orderly had reached over the patient instead of reaching under the cart it might have prevented the fall. Also, with the patient reacting from the anesthetic, the anesthetist could have watched more closely.

Side rails should have been placed on cart as soon as patient was transferred from operating room table. More personnel should be provided for in the recovery room and the number determined by number of patients.

2. Other than falls

Just prior to going through doorway, patient should be asked to keep arms in against body. Arms would be less apt to be injured if kept within the sheets.

The jar containing the dentures should have been put away in the patient's locker.

Simply checking cart before placing patient on it to make sure it is known which is head and foot end of cart.

Better and closer screening of auxilliary operating room personnel. Intensive instruction as to methods employed in maintaining a patent airway. A recovery room is needed.

Instruct interns never to leave anesthetized patients unattended on cart during transportation.

E. Preventive Measures Pertaining to Asepsis

1. Attaining sterility

If an indicator had been on the outside of the wrapper, the mistake would have been noticed sooner. The nurse should have been more careful in reading the time clock.

Conscientious effort on the part of all personnel who are responsible for sterilization and distribution of supplies.

2. Maintaining sterility

Change in the position of the assistant and if this is not possible sterile towels placed on the backs of the operating personnel immediately following draping of the patient and before the incision made.

Have the doctor's dressing room outside of the department. Enforcing staff rules so doctors come in time for their cases. Proper reporting to committee on infections.

More strict enforcement of rules and regulations by the committee on infections.

Change hospital policy regarding the distribution of linen to the operating room.

More emphasis on sterile technic to personnel in the operating room. Discontinuing visitors in the operating room.

Convert to individual soiled linen bag technique. Linen from each case bagged, tagged and sent to the laundry.

Dust tracks immediately before schedule starts each day rather than weekly.

Clean air conditioning filters routinely.

Setting a definite time for changing of water filters. Maintenance men instructed to contact supervisor or assistant before attempting any project, or have work done in the P.M.'s by maintenance men. Introduce flasks of sterile water. Dispense with water tanks completely.

F. Preventive Measures Pertaining to Identification

1. Identification of the Patient

Design an identification card to be pinned to the patient before leaving the surgical floor.

Using plastic identification bands around the wrist.

Make sure the correct patient is placed in the correct room when doing two identical procedures.

Better identification of patients.

Individual responsible for patient transportation should check schedule to see they are brought at the scheduled time.

Replacement of chart in proper section by individuals using chart. Head nurse should have made final check of patient and chart before leaving floor.

2. Identification of the Operative Site

Attempt should have been made to inform surgeon of delay. Hospital regulations were not carried out. Identification of the patient should have been made by the doctor before the anesthetic was started. Identification bands might have been helpful.

3. Identification of Medications

Use of different types of containers for solutions. Call scrub nurse's attention to the fact that there are other solutions on her stands. Identify all solution containers in some way that is known to all operating room personnel. Make it a rule not to pour hydrogen peroxide till operative procedure is finished.

Proper identification of medication. More care on part of nurses necessary. Closer supervision between graduate and student.

Do not use alcohol in any procedure on which novocaine is used.

Specimen label or tag should have been attached to specimen jar containing formalin. Pontocain label should have been completely removed before using bottle for other purpose.

G. Preventive Measures Concerned with Patient Preparation for Surgery

Removing excess solution after the prep so that the skin does not remain in contact with large amounts for a prolonged time.

Ascertain before surgery if the patient is allergic and if so, to what.

Making adequate provision for preps to be done night before surgery.

Provision made on pre-op sheet to designate prep so that it will be known if patient had not been prepped.

A check list containing pertinent details such as T.P.R., Dentures removed, Surgery consent, etc.

COLLEGE OF MEDICAL EVANGELISTS

School of Graduate Studies

INCIDENTS WHICH THREATEN PATIENT SAFETY

CLASSIFIED FOR USE IN TEACHING

OPERATING ROOM NURSING

by

Elsie Dorothy Vivian Wendth

An Abstract of a Thesis
in Partial Fulfillment of the Requirements
for the Degree Master of Science
in the Field of Nursing

May, 1959

ABSTRACT

The study was conducted in an attempt to identify incidents threatening the safety of patients in the care of operating room personnel and to classify them for use in teaching safety in operating room nursing.

Literature was reviewed to find concepts of safety and to aid in classification of safety hazards which are applicable to hospital patient safety. Need was shown for safe working conditions and for personnel with attitudes of safety as well as skills and knowledge. Safety included freedom from mechanical, thermal, chemical, bacteriological, and psychological injury.

The descriptive method of research using the critical incident technique was used for this study. One hundred incidents were reported by 39 operating room supervisors and clinical instructors in Illinois. Besides describing the incident the participants reported the factors contributing to the incident and suggested preventive measures.

Classification of the incidents was according to nature and under headings applicable to teaching. About one-half pertained to the use of supplies and equipment while transportation and anesthesia accounted for over one-fourth

of the incidents. Another fourth included those incidents which were related to asepsis and identification of the patient, the operative site, and medications. Very few incidents pertained to the preparation of the patient for surgery.

The incidents, their contributing factors, and directives for safe operating room nursing practice were presented in tabular form.

A brief interpretation was made regarding the causes of incidents as these were given by the participants. Suggestions were made for the use of the incidents for teaching safety in the operating room to students of nursing.