A survey of operating room nursing needs in twenty-eight selected hospitals with recommendations concerning improvement of operating room nursing services.

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Boston University
A SURVEY OF OPERATING ROOM NURSING NEEDS
IN TWENTY-EIGHT SELECTED HOSPITALS WITH RECOMMENDATIONS
CONCERNING IMPROVEMENT OF OPERATING ROOM
NURSING SERVICES

A Thesis
Presented to
the Faculty of the School of Nursing
of Boston University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Frances Ginsberg
August 1951

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CHAPTER I
INTRODUCTION AND OVERVIEW

During the past few years, several projects have been underway in different parts of the country to effect the satellite plan for improved hospital and medical care on a regional basis. One such project is that carried on by the Bingham Associates established in 1931 which brings together the New England Medical Center and Tufts College Medical School in Boston as its central medical school and hospital base, the Central Maine General Hospital in Lewiston, and the Eastern Maine General Hospital in Bangor as regional centers, and 39 rural, semi-rural, urban, and semi-urban community hospitals as smaller affiliated units.

The objectives of the Bingham Associates Program are to improve the quality of medical care given patients, and to advance medical knowledge. An attempt is being made to meet these objectives by means of regionalization of hospitals; evaluating the benefits of decentralization of medical care by offering

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1 The New England Medical Center consists of the Boston Dispensary, Boston Floating Hospital, Tufts College Medical School, Joseph H. Pratt Diagnostic Hospital and the Ziskind Laboratories.

2 Fourteen Affiliated hospitals are situated in Central Maine, thirteen in Eastern Maine, nine in Western Massachusetts, and three in other parts of Massachusetts.
direct assistance to the general practitioner in rural areas; developing ancillary services in rural areas; developing channels along which help may flow from larger institutions in the form of assistance, advice, and consultative services.

This concept of regionalization of hospitals is concerned with a closer coordination and cooperative association between widely scattered hospitals. ... A large teaching base hospital in a metropolitan center and associated with a medical school, affiliated with regional or intermediate hospitals in distant communities, and these, in turn, working closely with smaller affiliated community hospitals. Thus is established a voluntary, cooperative association by means of which a two-way flow of personnel and service is facilitated.3

As originally constituted, the Bingham Associates Program did not include nurses. By November, 1949, the nursing staffs of the hospitals participating in the plan and the medical administrative officers of the project realized that progress would undoubtedly be expedited if nursing was included. Because nurses represent the largest group of health workers in the institutions concerned, it was anticipated that the cost of a new program would be great. Since the Bingham Fund was unable to absorb all of this cost, it was recognized that additional funds would be required during the developmental period. The W. K. Kellogg Foundation was approached since the improvement of nursing services is in harmony with the purposes to which it lends financial support. Because the improvement of nursing services would require quality nursing education facilities and

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personnel which the participating Tufts Medical School was not prepared to supply, the Boston University School of Nursing was brought into the plan.

The first problem which the new project had to undertake was a survey of the needs which must be met if the quality of nursing care was to be improved and nursing knowledge was to be advanced. The second problem was to evoke plans through which the needs identified might be met. The present study is a part of this overall project.

Statement of the Problem

In connection with the overall plan of the Bingham Associates, W. K. Kellogg Foundation, Boston University School of Nursing Regional Nursing Project, (hereinafter in this study the project will be called BK-BU), the operating room nurses in the associated hospitals asked for some assistance in the improvement of surgical techniques which are the responsibility of the operating room nurse. Since it is anticipated that, during the period when funds are made available for the project, plans will evolve which will ultimately be on a permanent basis and self-supporting, it appeared to be a more desirable procedure to ascertain what other factors would be essential to develop quality operating room nursing services in these hospitals, and what plans could be made through which quality services would be reasonably assured.

In the present study, therefore, attempts will be made to
determine what is needed if the operating nursing services in the participating hospitals are to progress toward desirable quality standards, and what means can be proposed to achieve the desired and feasible goals.

**Purpose**

The purpose of this study is to ascertain: (1) the felt needs, if any, as expressed by the operating room nursing personnel, (2) the needs, if any, not recognized by the personnel, (3) the quality of the physical facilities of the operating rooms, (4) the quality of the personnel in terms of their functioning, preparation, and experience, (5) the type of administrative organization of the department, (6) the remedial measures, if needed, that could be feasibly applied to the situation, and (7) the potential source of supply of future operating room nurses in terms of the current basic nursing preparation.

**Scope of the Problem**

The problem is concerned with the operating room nursing services of only 28 of the 41 hospitals associated with the BK-BU program since this number of hospitals answered the preliminary questionnaire. From this source it was learned that 15 hospitals desired direct operating room nursing consultative service. To comply with these requests, as well as to follow

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4 Infra, p. 6.
through on the questionnaire, 14 hospitals were visited. One hospital was omitted because of distance. Subsequent to the hospital visit, a confidential report was written and will be sent to the appropriate administrator in the near future. These reports are not included in this study.

It is recognized that one of the prerequisites of a satisfactory plan is that the groups served should share in the planning. At the time of this study, this was not wholly feasible since, in the hospitals visited, the problem areas of immediate concern took precedence over long-range planning. However, many of the suggestions received from this group have been incorporated into this study. This, then, is only a suggested plan which, before implementation, must be shared with those whom it will serve.

Two kinds of needs are considered. Namely, those which are recognized by the current operating room nursing personnel and which will doubtless have first consideration in the proposal, and those which are real with respect to quality but which represent more distant goals.

Limitations of the Study

The study is further limited by the lack of available criteria by which the quality of operating room nursing services can be accurately assessed. Reliance, therefore, must be placed on the criteria which can be evolved from the literature and from experience with respect to surgical asepsis, patient-focused service, sound inter-personal relationships, and
operating room organization. Another limitation is that proposals must be based on the amount of time which it is reasonable to expect that operating room nurses may be released for study, institutes, or workshops. The study is limited by the financial resources within which the plan must function not only now while some funds are available from outside sources, but in the future when it must be essentially self-sustaining. Lack of standardization in the classification of surgical procedures is another limitation. Finally, the questionnaire returns from each hospital have not been included in this manuscript since it was felt that they would not be of general interest. Anyone interested in these worksheets is directed to the Bingham Administrative Office where the questionnaires are on file.

Sources of Data

At the outset, it was realized that certain specific data was needed about each of the hospitals, i.e. structural information, staffing, types and amounts of surgery, personnel policies. Factual data of these kinds were secured in advance through questionnaire. This was later expanded through direct observation in 14 hospitals, and interviews with operating room supervisors, operating room staff nurses, and with heads of various related departments. Selection of the hospitals for personal visits was made on the basis of those who, on the questionnaire, had indicated a need for direct help in their situation. The consultative service given, however, was
incidental to the observations and interviews.

From first-hand observation, learning experiences at the New England Center Hospital (hereinafter to be referred to as NECH) were identified. Guided interviews were conducted with the NECH operating room nursing staff to amplify their needs.

Three sources were used to describe that which constitutes quality operating room nursing: (1) Professional literature relative to quality nursing in general, (2) current scientific literature relative to asepsis, techniques, and the dynamics of human behavior, and (3) eleven years of graduate nurse operating room experience plus advanced academic preparation in this area.

To develop a standard which would facilitate tabulation of the questionnaire data, five broad categories were selected on the basis of hospital bed capacity as recorded in the current American Medical Association Directory. The Daily Average Census of Patients would have been a more accurate standard, but, in filling out the questionnaire, several hospitals omitted this figure.

Treatment of the Data

The preliminary step in this study was the development of a questionnaire which was designed to secure specific factual information about each affiliated hospital. Using this as a point of departure, these data were amplified by: (1) a checklist which assisted in direct observations of operating room physical equipment, techniques, and procedures, (2) guided
interviews with operating room supervisors and operating room staff nurses to help determine their needs; and guided interviews with heads of various related departments to secure objective opinions as to ways whereby the operating room might serve the needs of the hospital more effectively.

Identification of learning experiences and interviews with the NECH operating room nursing staff helped to determine their needs in the event that this clinical area in the base hospital might be selected for Refresher Course experience for the staffs of the affiliated hospitals.

Criteria for measuring quality operating room nursing services were developed after perusal of the literature and also drawing from personal experience. A treatise of the term "quality" is of necessity extremely subjective, but the attempt is made to restrain an idealistic philosophy in favor of a more pragmatic standard against which hospital practices may be compared.

Since the questionnaire returns showed that the bed capacities of the participating hospitals fell into convenient groups, it was felt advisable to forego arithmetical progression in favor of the following more accurate groupings:

<table>
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<th>Group</th>
<th>Range</th>
<th>Code Letters</th>
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<tr>
<td>I</td>
<td>20-25 beds</td>
<td>A-B</td>
<td>2</td>
</tr>
<tr>
<td>II</td>
<td>26-50 beds</td>
<td>C-K</td>
<td>9</td>
</tr>
<tr>
<td>III</td>
<td>51-75 beds</td>
<td>L-S</td>
<td>8</td>
</tr>
<tr>
<td>IV</td>
<td>100-151 beds</td>
<td>T-X</td>
<td>5</td>
</tr>
<tr>
<td>V</td>
<td>200-250 beds</td>
<td>Y-D2</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>Number of hospitals</td>
<td>28</td>
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Throughout this study, the hospitals are referred to by group number or individually by code letter.

**Method of Presentation**

Organization of the material in this study is as follows:

Chapter II - Philosophy of Quality Operating Room Nursing.

Chapter III - Investigation and Findings of the Study.

Chapter IV - Summary Abstract, Conclusions and Recommendations.

5 Administrators who desire to identify their hospital may request their Code Letter on file at the Bingham Administrative Office.
CHAPTER II

PHILOSOPHY OF QUALITY OPERATING ROOM NURSING

The problem upon which this study is based is to determine whether quality operating room nursing is or is not being demonstrated in the hospitals affiliated with the BK-BU Program. It is therefore essential that criteria be developed against which current practices may be appraised. A clarification of terms based on this writer's conception of Nursing and of Quality is needed for effective understanding.

Hundreds of books have been written on the subject, yet no two authors agree upon a definition of Nursing. Bowen's unpublished paper presents an inclusive point of view which will be used to develop specific criteria of quality operating room nursing.

Nursing may be defined in three words: interpretation, ministration, and coordination. Interpretation means knowing what to look for, skill in observation, recognition of the significance of the observed behavior, and the ability to communicate effectively these findings to the proper authorities.

Ministration includes ministering to the fundamental health needs of persons and communities in those areas which are the prerogative of nursing. In essence, it provides sustenance to the broken body and comfort to the bewildered spirit and teaches man how to help himself maintain maximum health, physical, mental, emotional, and social.

Coordination embraces, first, recognition of the purposes and areas of functioning of other health workers within the institution in which the nurse is
working, then of the other social groups so concerned within the community, and second, the coordination of these activities for maximum benefit to the person, his family, and the community.

Thus, all nursing knowledge and professional practice is concerned with the dynamics of human relationships and as such is social in nature.¹

Quality is a nebulous term that cannot be defined with such eloquence. Webster defines "quality," in the philosophical sense, as:

A property or attribute; a property being a peculiar or special quality; an attribute being an essential or inherent quality or property.

This verbiage does little except to point out that due to its subjective nature, the term is ambiguous and difficult to delimit. Therefore, in lieu of a specific definition, the attempt is made to describe indices of its presence in an operating room.

Using Bowen's definition of Nursing as a frame of reference, quality operating room nursing is specifically described in terms of interpretation, ministration, and coordination. The philosophy which follows and which continues throughout this study is that of the author.

Interpretation implies the ability to understand and to effectively communicate the objectives which guide the activities of the operating room; the mental, emotional, and physical needs of patients; the needs of the surgeon and his team; the

¹ Eleanor Page Bowen, R.N., "Nursing as a Social Science" (Unpublished paper, Boston University School of Nursing, June, 1951).
relationship of the operating room to the rest of the hospital; the role of professional nursing to other professional lay groups.

Ministration means ministering to the fundamental health needs of persons and self. It includes the ability to give comprehensive operating room nursing care to patients. This implies a service which considers the patient as an individual, recognizing all of his needs including the psychological factors underlying surgical procedures. Such a patient-focused service is dependent upon an awareness that the operating room experience is but a part, albeit an integral part, of the patient's total hospitalization. It is not an isolated, fragmentary experience, but a crisis situation which demands supportive treatment in the operating room to maintain the patient's emotional and physical equilibrium. The operating room environment should corroborate this purpose. Ministration to the surgeon is of such a nature that it avoids undue emotional tensions and permits him to function freely. It should include physical facilities which permit the safe care of patients, and sufficient personnel in terms of quantity and competence. The latter implies skill in carrying out activities peculiar to nursing in the operating room, i.e., manual dexterity demonstrated on the operative field and utilization of scientific principles which are basic to effective functioning in this area. Ministration as applied to the individual nurse includes the ability to keep abreast of the times, to effectively analyze
problem areas, to be self-directing, to critically appraise outcomes, and to promote personal and professional growth.

Coordination means group living and the ability to make harmonious adjustments. The application of principles of democratic organization is basic to sound functioning of an operating room. This implies group planning regarding policies, procedures, and techniques; working conditions conducive to employee growth and satisfaction, i.e. time off duty, financial policy, In-Service education; rapport within the group with each member cognizant of his rights and responsibilities; surgical committees serving as combined audits to improve the care of patients. Coordination includes the identification and effective utilization of learning opportunities as well as the correlation and integration of theory and practice. Finally, quality operating room nursing may be measured in terms of the nurse's ability to work effectively with all members of the surgical team as well as with the personnel of related hospital departments, i.e. hospital administration, Central Supply service, X-Ray, laundry, maintenance, pharmacy, wards. Through these associations she should integrate psychological principles into professional and personal attitudes, ideals and judgments.

More than one doctor and hospital administrator has challenged these views charging that the philosophy is too idealistic. It is believed that society has a right to expect this type of quality nursing from professional nurses.

The preparation necessary to help a nurse to develop these
characteristics varies with the individual. Experience may be the best teacher for some nurses while for others no amount of experience will help them to gain greater insights. Postgraduate education may prove helpful to some nurses while for others it may not be a profitable experience, or, if anything is gained, it is negative learning. This situation is usually not the fault of the student enrolled in such a course. Within the realm of the author's experience, the majority of postgraduate courses offered in the past were of little educational benefit to the student. In fact, some hospitals were notorious for their frank exploitation of postgraduate students. Academic preparation in a recognized institution of higher learning may prove invaluable to some nurses. Yet, there are those with this preparation who demonstrate a poorer quality of nursing service than some nurses without these advantages.

What, then, is the answer to this puzzling question? What differentiates a good nurse from a poor one? The core of the problem is interest and motivation based on sound basic preparation and enriched by educational experiences on the graduate level. There are a few individuals who practice the type of quality nursing described above without benefit of advanced academic preparation. These nurses, through their own initiative, insight, understanding, and learning through life's experiences, have constantly improved themselves and their professional practice. Although academic preparation of itself does not improve the quality of nursing service, with careful
selection of candidates, it does expedite the preparation of more nurses to demonstrate the type of quality nursing previously mentioned. Baccalaureate programs in professional schools are designed to offer further preparation for modern professional nursing, and afford opportunity to broaden and deepen cultural appreciations and social understandings. Such an educational plan is rewarding both to the individual and to society. With this program, the carefully selected nurse develops keener insights into her own behavior and that of others; greater understanding of her own strengths and weaknesses; knowledge of scientific principles which are applicable not only to her professional work but also to life's situations; and a sense of confidence and assurance which is discernible in her relationships with people, in her respect for the individual and recognition of his potentialities for growth, in her supervision through a leadership role, in her extension and sharing of her security thereby increasing the cooperativeness and integrativeness of her group. It is felt that this kind of educational program, if made available to selected students who would later assume supervisory roles, would inevitably lend itself to improved nursing services to patients.

During World War II, the newspapers published stories replete with laudatory comments regarding the "quality" nursing services given our soldiers behind the front lines. Since the author can speak from experience in such situations, the comments must be challenged as being exaggerations of the truth,
perhaps due to patriotic fervor. True, the best possible type of nursing service was given. But improvisation was the nucleus from which this service grew. The ingenuity of the personnel was taxed to develop a variety of contrivances which would simulate the type of equipment found in most hospitals within the continental limits. Quality nursing services, as defined in this study, was, of necessity, sadly lacking. It is believed that quality operating room services cannot be given in an environment where the physical aspects do not meet minimum accreditation standards in terms of the safe care of the patient who, after all, is the most important person in the department.

War experiences did prove, however, that many medical technicians could be taught to demonstrate superior performances as scrub nurses. Perhaps the answer to the widespread shortage of qualified scrub nurses is the training of carefully selected non-nurse assistants.

If it may be assumed that the characteristics previously mentioned describe desirable quality standards for operating room nursing services on the graduate level, it will be readily apparent that specific changes are needed in the basic preparation for this specialty. Although statistics are not available, it is felt that, in most hospitals, only a very small percentage of the nurses in each graduating class seek operating room nursing as their area of specialization. Hospital administrators and nursing directors are concerned about operating room nurse personnel shortages. It is not the purpose of this study
to thoroughly investigate the problems of basic preparation, but, since they are directly related to the potential source of supply of qualified operating room nurses, the following appropriate comments are offered. Traditionally, the teaching content and methodology of instruction in this area emphasizes the acquisition of operating room skills and development of manual dexterity. These curricula lack important factors which are basic to intelligent functioning in an operating room, namely, understanding the patient as a person rather than as a case; the need for continuity of preoperative, operative, and postoperative care; and the understanding of scientific principles which are used in the operating room to safeguard the patient's health. The student, therefore, learns to function as an efficient automaton. She knows HOW to do procedures, but lacks the understanding as to WHY she is doing them. This type of instruction, carried on usually within an atmosphere of tense excitement, leads to frustrations, anxieties, and inadequate performances. Under these circumstances, the student develops an abhorrence for this type of work. The following topical plan is suggested as a constructive means by which current practices may be improved. A similar plan is now functioning in the Episcopal Hospital School of Nursing, Philadelphia, Pennsylvania.

**Basic Level:** Teach operating room nursing as a part of Medical-Surgical nursing emphasizing principles and their application as they relate to and affect patient care. (Approx. 20 hours).
Teach basic skills in the operating room, i.e. scrubbing, gowning, gloving, threading a suture, holding retractors. (Approx. 6 hours).

Students give nursing care to selected patients during their preoperative, operative, and postoperative phases, thereby living through the continuity of the experience with them. Written Patient Care Studies demonstrate the students' understanding of comprehensive nursing care. (State requirements regarding number of days in the operating room and number of scrubs are easily met).

**Senior Level:** Students with demonstrated ability, who have signified an interest, may return to the operating room for their final 1-6 months in the school. Experiences are planned so as to implement and supplement basic knowledge and to assist the student to develop skills peculiar to this type of work.

This plan is based on sound educational principles, and, obviously, excludes the possibility of students being used to service the hospital. It is feasible only if the basic philosophy is clearly understood and accepted by all members of the hospital staff. This is a type of program which would require the full-time efforts of a qualified instructor to teach, guide, supervise, and coordinate the plan. It may be presumed that some young graduates who have had this type of basic preparation will be motivated to desire further study in this specialty.

Stated succinctly, quality operating room nursing connotes professional competence in a specialized area in which are inherent characteristics essential to the realization of personal and professional growth. It implies, in addition to the acquisition of manual skills peculiar to this type of nursing:

(1) a patient-focused service where his mental and emotional as
well as his physical needs are met, (2) an environment conducive
to sound interpersonal relationships between all members of the
operating room team, (3) a knowledge of the underlying prin-
ciples of the social and physical sciences with their applica-
tion for the effective and efficient care of patients.

In the appraisal of current practices in the selected
hospitals, the following minimum standards in relation to qual-
ity operating room nursing will be assessed: (1) patient-
focused services, (2) physical facilities which permit the safe
care of patients, (3) the emotional tone of the environment,
interpersonal relationships between all members of the team,
(4) democratic organization, group planning, In-Service educa-
tion, personnel policies, and (5) sufficient personnel in terms
of quantity and competence.

It is recognized that the affiliated hospitals may vary
in the degree with which these criteria are being met. This
study attempts to constructively point up the needs, if any,
and it is based on the premise that hospital administrators are
ever seeking ways by means of which improvement in the quality
of nursing service offered each patient will be reasonably
assured.
CHAPTER III

INVESTIGATION AND FINDINGS OF THE STUDY

The Questionnaire

As was previously mentioned, the questionnaire was sent to the 41 affiliated hospitals and 28 returns (68.2 per cent of the total) were received. One hospital administrator, replying by postcard, refused to fill out the questionnaire, and another withheld the return stating that she needed no help. Using the American Medical Association Directory of 1950 to determine hospital bed capacities, five broad categories (Groups I-V) were selected as titles under which the information was tabulated. Of these hospitals, 20 have been approved by the American College of Surgeons. The findings of both the questionnaire and check-list were evaluated in terms of criteria found in the following sources: Manual of Hospital Standardization published by the American College of Surgeons, Bulletin Number 56 of the National Fire Protection Association, several publications of the United States Public Health Service (Hospital Facilities Section), The Architectural Record, and Modern Hospital as well as Hospital publications. Since most hospitals are familiar with the Manual of Hospital Standardization, this source was used most frequently. These minimum standards are nationally accepted guides for hospitals. Therefore, they are expressed in broad generalities and often subject
to misinterpretation. Throughout this study, when it was found that certain physical facilities prohibited safe care of patients thereby violating one or more of the standards, specific criteria were developed based on scientific literature as well as the author's conception of the principle, in the hope that hospitals will benefit from this investigation.

Critical analysis of the questionnaire data showed the following findings: The number of rooms which constitute each operating room suite vary widely from 1-20 with little or no relationship to the size of the hospital. On the other hand, with some exceptions, the number of rooms used for surgery tends to increase proportionately from 1-7 in relation to the size of the hospital. MacDonald, Senior Hospital Consultant for the USPHS states that "Even in the small hospital there should be a minimum of one major and one minor operating room." Hospitals E, F, J, K, and R violate this standard, but the volume of work in each of these hospitals does not exceed that which a small suite might be expected to perform. When the two figures for each of the hospitals are compared, a wide divergence is noted even within specific groups. Hospital G in Group II, for example, has 11 rooms in its suite using only 2 of these for surgery; yet, Hospital J, in the same Group, has a 1-1 ratio. According to MacDonald, "As the size of the hospital increases, one major operating room should be supplied for each

50 beds in general hospitals, together with one minor operating room and various specialty operating rooms as may be required. Several hospitals fail to meet this criteria. Information related to this problem is summarized in Figure 1, page 23. The purposes for which the rooms are used serve to explain the striking variations seen. Four hospitals have an Anesthesia Room as a part of the operating room suite and two of these also have a Recovery Room. An Anesthesia Room is considered desirable since it offers a quiet calm environment, away from the center of the operating room activities, where the patient may wait his turn in surgery as well as be induced with an anesthetic agent. It is felt that these factors help to minimize the degree of emotional trauma experienced by patients. A Recovery Room is considered desirable since it provides for constant supervision of patients during their critical period. The advantages of such a room are that: (1) it affords a place where the patient may receive expert nursing care immediately postoperatively and until he has completely recovered from anesthesia, or until his blood pressure has been stabilized. Seriously ill patients or those who have had excessive bleeding may remain in the recovery room over-night, (2) it permits a concentration of specialized equipment, (3) it provides an opportunity for the surgeon and anesthetist to visit the patient following surgery to check on the patient and avoid

2. MacDonald, loc. cit.
Figure 1.

NUMBER OF ROOMS CONSTITUTING AN OPERATING ROOM SUITE COMPARED WITH THE ROOMS USED FOR SURGERY IN 28 SELECTED HOSPITALS.

Source: Compiled From Information on Questionnaires
postoperative complications, (4) it practically eliminates the need for special duty nurses since the patient is receiving specialized nursing care. Hospital V has a Cold Steam Room as a unit included in its suite. In this room specialized therapy is given patients who suffer from tracheitis. Perhaps the greatest diversity is due to the number of work and storage rooms found. Servicing the hospital Wards with sterile goods and supplies is an operating room function in 19 of the hospitals. For this reason, greater storage and work space is required than would be true if only the operating room needs were considered. The Public Health Service's studies on the design and construction of general hospitals show that the "One workroom for a surgical area is sufficient." However, 2 and 4 rooms respectively were found in 2 hospitals of early architectural design.

There was no uniformity as to the location of the operating room suite in relation to the rest of the hospital. Ten hospitals reported their operating room on the top floor, 3 were located in the basement, and others were found on various floors of the institution. In most instances, the department was conveniently situated near X-Ray and Laboratories. In lieu of elevators, Hospitals A and F reported the use of canvas

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3 Julie M. Carnahan, "Recovery Room for Postoperative Patients," American Journal of Nursing, XLIX No. 9 (September 1949), pp. 581-582.

litters for the transportation of patients.

Investigation shows that:

A Central Supply Service concentrates in one location the facilities for the care and assembling of instruments, packs, equipment and clinical supplies, with sterilization, if indicated, storage and distribution as required to all hospital departments. This permits a saving of equipment, supplies and effort with increased general efficiency and a higher standard of work by skilled personnel.\(^5\)

It is interesting to note that 9 hospitals in this study listed a Central Supply Service as an independent department. Out of the 14 hospitals visited however, although 5 had Central Supply Rooms as separate departments, only D2 utilized its department to completely service the needs of the operating room. Hospital C reported a policy whereby a portion of the operating room needs were met by the Central Supply Service. In three hospitals where a Central Supply Service was functioning, the operating room prepared its own supplies.

The United States Public Health Service states that the desirable minimum size for operating rooms is 18\(\times\)15 feet (170 square feet). Computing the dimensions of all of the operating rooms in square feet, there was a preponderance of rooms from each group which ranged from 200-300 square feet. Each group had one or more operating rooms within the 100-140 square foot range. The largest rooms were found in 2 hospitals in Group III,\(^5\)

\(^5\) Ibid., p. 32.
\(^6\) Ibid., p. 29.
ranging from 460-570 square feet.

The size of the work rooms was difficult to compute accurately since several hospitals utilize corridor space which was not included in the dimensions given. However, the average range was small, 100-129 square feet, with each of the hospitals having one or more workrooms in the 70-99 square foot range. The largest workroom, used as a Central Supply Room for the hospital was found in D1, 325 square feet.

Tabulation of the amounts of surgery performed annually in each of the hospitals, compared with the number of operating rooms in each hospital, presents an unusual picture. Hospital C and D in Group II, for example, using 3 and 2 rooms respectively, complete more surgery yearly than 6 of the hospitals in Group III. This is true despite the fact that the latter have greater physical facilities. Figure 2, page 27, illustrates this point clearly. It may be noted that these same hospitals exceed or equal the number of operations performed in Hospital U, (Group IV). This may be explained by the fact that the latter is subject to seasonal fluctuations in patient census due to its geographic location. Hospital L does more surgery than any other in its group, perhaps, because it is located in a well-populated industrial area. It is interesting to note that Hospital T exceeds all others in its group even though it is situated in a large city where there are several other hospitals. The 6,894 cases credited to Hospital Y is particularly striking because it exceeds all the others although it is not the
Figure 2.

NUMBER OF OPERATIONS PERFORMED
ANNUALLY IN 28 SELECTED HOSPITALS

Number of Operations

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Group I -- 20-25 Beds</th>
<th>Group II -- 26-50 Beds</th>
<th>Group III -- 51-75 Beds</th>
<th>Group IV -- 100-151 Beds</th>
<th>Group V -- 200-250 Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
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<tr>
<td>B</td>
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<td>Z</td>
<td></td>
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</tbody>
</table>

Source: Compiled from Questionnaire returns.
largest hospital in the association. Further investigation showed, however, that this is the only hospital in the affiliation whose regular operating room schedule extends over a 12-hour period (7 A.M.-7 P.M.). The schedules of all of the other hospitals bear no relation to the amount of surgery performed. On the whole, the day's work begins anywhere from 7 A.M.-9 A.M. and extends to 11 A.M. - 3 P.M.

Since there is no standard for the classification of surgical procedures, an accurate tabulation of the work performed within each of the surgical services is not possible. Hospital X and D2, for example, include Gynecologic, Plastic, Thoracic, and Gastric surgery under the classification of General Surgery. Other hospitals consider each of these as specialty services. Hospitals Q, T, Z, and A include, under a Miscellaneous classification, lacerations, blood transfusions, application of casts, dental, burn dressings, vaginal and proctoscopic examinations, Cystoscopies, and others. Most hospitals categorize the majority of these under General Surgery. This lack of agreement regarding classification partly explains the striking distribution of kinds of cases performed in each hospital when the numbers designating the amounts of surgery within each service are transposed into percentages. Figures 3, 4, 5, pages 29, 30, and 31, help to clarify this point. Although none of the hospitals in the association is a specialized surgical center, some of the predominant peaks seen on these graphs are attributable to surgeons in particular localities whose major
Figure 3. COMPARISON OF SPECIALIZED SERVICES IN 26 SELECTED HOSPITALS*

Percentage based on the total amount of surgery performed.

Percent

100

100

50

50

0

0

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z D

Hospitals

KEY

- General Surgery

- Miscellaneous Surgery

* Hospitals B and F omitted tabulations

Note: Hospital G figures are estimated based on 4 mos. operation

Source: Compiled from information on Questionnaires.
Figure 4.

COMPARISON OF SPECIALIZED SERVICES
IN 26 SELECTED HOSPITALS *

Percentage based on the total amount of surgery performed.

Ear Nose & Throat Surgery  Urologic Surgery

Percent

35 50
40

KEY
A-(20-25) beds, C-K-(26-50) beds, L-S-(51-75) beds
T-X-(100-151) beds, Y-D2- (200-250) beds
- Zero  x-Cases listed under General Surgery

* Hospitals B and F omitted tabulations.
Note: Hospital G figures are estimated based on 4 mos. operation.

Source: Compiled from information on questionnaires.
Figure 5.
COMPARISON OF THE SPECIALIZED SERVICES IN 26 SELECTED HOSPITALS *

Percentage of cases based on the total amounts of surgery performed.

Orthopedic Surgery

Eye Surgery

Gynecologic Surgery

Neurosurgery

Thoracic Surgery

Cardiac Surgery

KEY
A- (20-25 Beds) C-K- (26-50 Beds) L-S- (51-75 Beds)
T-X- (100-151 Beds) Y-D2- (200-250 Beds)
- - Zero ❤Cases listed under General Surgery

* Hospitals B and F omitted tabulations
Note: Hospital G figures are estimated based on 4 mos. operation.
Source: Compiled from Questionnaire returns.
50 per cent averaged 44 hours; 7 per cent averaged 40 hours; and 11 per cent ranged between 41-1/2 - 45 hours per week. It is interesting to note that although Hospital Y exceeds all others in the amount of surgery performed annually, their graduate staff comprises 6 nurses who work a 7-1/2-hour day, and a 44-hour week. Further investigation showed that this hospital, with a school of nursing, plans the rotation of basic students so that 10 students are receiving operating room experience throughout the year.

The average number of operations performed per day ranged between 1-15 cases. The amount of emergency work after 7 P.M. ranged from 1 case per month to 6-7 cases per week. The call policy for emergency work was difficult to evaluate since the data was gathered by check-list and only 14 hospitals were visited. However, from the information received, there was a wide divergence in the policies. The range varied from 1 week every third week to the other extreme of 6-7 times a week. To compensate their nurses for overtime work, only 3 hospitals pay at the regular hourly rate. Twenty hospitals make up the time to each nurse as soon as the operating room schedule permits her release. Other hospitals allow the nurse to determine whether she wants the extra time or money. Three hospitals have no ancillary personnel. Other hospitals in the association employ from 1-6 auxiliary workers. This information is more clearly summarized in Figure 6, page 34.

The operating room nursing preparation and experience of
Figure 6.
COMPARISON OF PARTICULAR PERSONNEL
POLICIES AND HOSPITAL PRACTICES IN
28 SELECTED HOSPITALS

<table>
<thead>
<tr>
<th>Code</th>
<th>Number of Full-Time Grad. Staff</th>
<th>Average Hours of Work Per Day</th>
<th>Average Hours of Work Per Week</th>
<th>Average Number of Operations Per Day</th>
<th>Average Number of Emergencies After 7 pm Per Week</th>
<th>CALL Policy for Emergencies Pay Week</th>
<th>Make-Up Time Policy</th>
<th>Number of Ancillary Personnel</th>
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<td>1</td>
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<td></td>
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<tr>
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<td>(1)</td>
<td>1</td>
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<tr>
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<td>48</td>
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<td>1 per mo.</td>
<td>6x</td>
<td>(1)</td>
<td>1</td>
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<tr>
<td>F</td>
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<td>8</td>
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<td>1</td>
<td>1 per mo.</td>
<td>6x</td>
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<td>1</td>
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<td>G</td>
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<td>3</td>
<td>1 per mo.</td>
<td>3-4x</td>
<td>(1)</td>
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<td>L</td>
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<td>3-4x</td>
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<tr>
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<td>8</td>
<td>48</td>
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<td>1</td>
<td>1-2x</td>
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<td>O</td>
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<td>(1)</td>
<td>1</td>
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<td>1.5</td>
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<td>(1)</td>
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<td>(1)</td>
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<td>44</td>
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<td>(1)</td>
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<td>(1)</td>
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<td>44+</td>
<td>8.2</td>
<td>5</td>
<td>(1)</td>
<td>2</td>
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</tbody>
</table>

**KEY**

- [ ] unknown
- [ ] Data Omitted
- (1) Time Off Given
- ($ $) Extra Pay Given

T-X-(100-151 Beds) Y-D2-(200-250 Beds)

**Source:** Compiled from information on Questionnaires plus Check-List data.
the 86 full-time graduate nurses employed in the selected hospitals presents a striking picture when computed in percentage figures. Seventy-six and two tenths per cent have from 6 months to 30 years experience in the operating room nursing. Twelve and five tenths per cent have taken postgraduate courses in operating room technique lasting from 4-6 months. Four and five tenths per cent have taken Dr. Carl Walter's one-week course in Operating Room Technique. Six and eight tenths per cent have from 3-26 college credits in subjects related to their area of interest. Only 1 nurse in this group holds a B.S. degree, and another a B.N. degree. Although there are some exceptions, there is sufficient evidence to state that, on the whole, the best qualified nurses in this area tend to seek employment in the larger and more active institutions.

None of the hospitals reported a planned, regularly scheduled In-Service Education program for the graduate nurse staff in the department. However, 3 hospitals indicated that when the operating room schedule permits, classes in interesting subjects are arranged.

Tabulation of the questionnaire data showed that 47-50 nurses would be interested in taking a short refresher course in operating room nursing if such a course would be offered at the NECH. This figure is encouraging since it represents approximately 54 per cent of all the nurses employed by the hospitals participating in this study. Suggestions as to the areas of major emphasis for such a course were as follows:
<table>
<thead>
<tr>
<th>Number of Hospitals</th>
<th>Area of Emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Personnel Management.</td>
</tr>
<tr>
<td>5</td>
<td>Teaching Operating Room Nursing to Graduate Nurses.</td>
</tr>
<tr>
<td>12</td>
<td>Teaching Operating Room Nursing to Basic Students.</td>
</tr>
<tr>
<td>8</td>
<td>Supervision in Operating Room Nursing.</td>
</tr>
<tr>
<td>9</td>
<td>Management of Operating Room Suite.</td>
</tr>
</tbody>
</table>

It is interesting to note that Hospital M, without a school of nursing, indicated an interest in teaching basic students; whereas Hospitals Q and V that currently have schools of nursing did not indicate this area for major emphasis.

To determine in what other ways the regional Nursing Program might serve the participating hospitals in regard to operating room nursing, the replies were tabulated as follows:

<table>
<thead>
<tr>
<th>Number of Hospitals</th>
<th>Indicated Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Direct help by an Operating Room nurse consultant.</td>
</tr>
<tr>
<td>11</td>
<td>Periodic refresher courses in the regional hospitals in Maine.</td>
</tr>
<tr>
<td>15</td>
<td>Periodic refresher courses at the NECH.</td>
</tr>
<tr>
<td>20</td>
<td>Establishment of an Inter-hospital council of Operating Room nurses in each region to discuss problems in Operating Room nursing with help from consultant.</td>
</tr>
</tbody>
</table>

From the 28 hospitals participating in this study, 9 have schools of nursing, and were thereby able to complete the last 4 questions of the questionnaire. Although in some instances data were omitted, the information obtained is summarized as follows:

In 4 hospitals, the responsibility for the Basic Students'
formal instruction rests with the operating room supervisor. One of these supervisors, in Hospital P, is a qualified anesthetist. Hospital V has a qualified anesthetist temporarily directing the operating room administrative plan, but she has delegated the teaching responsibilities to the graduate staff nurses. In the remaining 4 hospitals, the supervisor and her assistants teach the formal classes. Eighteen nurses have teaching responsibilities within the 9 hospitals. Their aggregate experience is 76 years although the range is from 6 months to 30 years. One nurse holds a bachelor's degree in nursing, and 3 have from 3-26 college credits. Three nurses have had Dr. Walter's course in Operating Room Technique and 3 others have taken 4-6 months postgraduate courses.

Correlation of formal classes with the operating room experience was reported by only 2 hospitals, Z and P. All other hospitals indicated that the classes were given on the average of once a year, and those students who were rotated through the department immediately after this instruction did achieve a degree of correlation. Hospital D2 stated that supplemental classes were given students as needed. The policy of rotation of Basic Students through the operating room experience varied with the number of students in each class and the number of classes admitted to the school yearly. On the whole, however, the range was as follows:

Students are assigned to the Operating Room from 5-52 times each year.
The number of students assigned to the department at one time range from 2-10.

Length of Operating Room experience: 6 hospitals reported 8 weeks; Hospital W reported 56 days or 1 month; Hospital Q indicated a 2-month experience; and Hospital P reported a 3-month experience. State requirements for Maine are a minimum of 8 weeks and a maximum of 12 weeks. Massachusetts requires a minimum of 56 days. Maximum is not given.

In all hospitals, the experience is continuous.

Operating room clinical experience in Hospital T begins immediately after the preclinical period and continues throughout two years. Hospital Q begins the experience during the first half of the second year in the school. All other hospitals plan their rotations to begin during the second half of the first year in the school with each class completing the experience in one year.

Senior nurse operating room experience is not offered in Hospitals D1 or D2, but in all other hospital schools of nursing selected basic students do return to the department in their Senior year for experiences in scrubbing, circulating, and assisting the graduate nurses. It was indicated that this type of experience would serve to supplement the basic instruction.

Only 5 of the 9 hospitals with schools of nursing included a Course Outline with the Questionnaire. It was later learned

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7 This may be a typographical error.
8 Approving Committee, Maine Board of Registration of Nurses (1947), p. 11.
that some schools have no outline. An evaluation of any course from a written sheet is at best inadequate, but this was more difficult because 4 of the hospitals sent topical outlines which gave no insight into teaching methodology or student activity. Hospital Z presented a satisfactory plan from the standpoint of structure. However, all of the outlines showed a strong tendency toward the formalized, didactic type of teaching giving much emphasis to the acquisition of skills and minimizing or eliminating entirely the understanding of principles.

Check-List

Since the literature was devoid of a check-list that would effectively supplement the information obtained by questionnaire, one was developed to meet this purpose. Fourteen hospitals were visited and consultative service given while, at the same time, observations as directed by the check-list were recorded. A summarization of these data is as follows:

Criteria used to evaluate the type of flooring found in the selected operating rooms were supplied by Hudenberg.

Acceptable floors include a terrazo floor containing acetylene black, a terrazo-type floor containing magnesium oxychloride, a composition floor, a plastic floor and floor coverings made of such materials as conductive rubber, conductive linoleum and conductive asphalt tile.\[11\]

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10 See Appendix, p. 83.
Since this author is neither qualified nor equipped to test the conductivity of the floors, the information recorded constitutes data reported by the operating room personnel. The types of floor coverings include tile, rubber, conductive rubber, cement, concrete, terrazo, granite, and battleship linoleum.

Two hospitals have acoustic ceilings while all the others are made of plaster.

In 4 hospitals, all operating room area walls are constructed on non-glare tile to a height of 6 feet. One hospital has tile from ceiling to floor which is one of the United States Public Health Service recommendations. D2, perhaps the best equipped of any hospital in this study, has conductive rubber on the walls as well as on the floors. Seven hospitals have plaster walls and one has a stone substance resembling slate.

Five hospitals have rounded wall corners while all others are square. To facilitate cleaning, obviously, the rounded corners are to be preferred.

Overhead lights are considered adequate in all but one hospital since they are intact and satisfactorily illuminate the rooms. The cracked globe found in Hospital M was felt to be hazardous.

Nine hospitals use the Castle operating light, 2 use the Opray Beam, and 5 the American Sterilizer product.

Following the recommendations of the American College of Surgeons, all hospitals have some form of emergency lighting.
service. Twelve hospitals have low-voltage battery units attached to portable operating lights. Hospital N has a larger storage battery system whereby a direct current circuit automatically illuminates the department upon failure of normal supply. Hospital L also has a separate current, but it illuminates only one light.

The use of Ultraviolet lights is a controversial subject which this study does not seek to solve. It is merely noted that Hospitals M and L are using these lamps in their operating rooms.

"Electrical outlets and switches should be 5 feet above floor level or explosion-proof in design and manufacture." Only 6 hospitals currently adhere to this standard. Others were unaware of the regulation which permits the use of the arc-type switch if it is raised above the 5 foot floor level. One hospital felt secure in using mercury type switches until attention was directed to the regulation that "Mercury-type switches, although producing no exposed spark on operation when in normal condition, are not listed by the Underwriters' Laboratories, Inc., for use in Class 1, Division 1 (hazardous) locations unless enclosed in explosion-proof housings."

Four hospitals have Wall Suction Apparatus, and all hospitals have one or more portable suction machines.

Hospital T, a teaching hospital, has a portable gallery. Although they are not required in non-teaching institutions, one is found in Hospitals M and L.

Some type of intercommunication system is recommended for large operating room suites. D2 is the only large hospital equipped with a light system by means of which aid may be summoned. Hospital E with a 1-room, 1-nurse suite uses a light system which flashes in the hospital administrator's office when help is needed.

In this study, standard room equipment is considered adequate if the necessary apparatus is present and functional; i.e. operating room table, anesthesia work table, instrument and dressing tables, sponge racks, basin stands, waste buckets, stools. With this as the criteria, all hospitals have adequate room equipment. The quality of the equipment or its conductivity was not accurately assessed, but it ranged from monel metal equipment complete with drag chains and conductive casters to enamel (non-conductive) kitchen tables, used as instrument and dressing tables.


17 E. Atwood Jacobs, "Remodeling the Operating Room to Assure Safety," Hospitals (1950), pp. 42-44.
Three hospitals do not have a Resuscitator in their operating rooms. It is felt that a Resuscitator should be considered standard equipment in an operating room. When the need for its use arises, this need is acute and immediate and such a machine may save a patient's life. Five hospitals do not use an Electrocoagulation machine, and 3 hospitals do not use Live Cautery. Hospital F, a small, privately owned hospital, has none of the above.

Explosion hazards are of primary concern to everyone.

Every safety-measure should be used to protect patients and personnel from the hazards of violent injury or death. . . . By nature, most of the anesthetic gases used today are highly combustible. Their use demands the utmost caution, since accidental 'touching off' by whatever source may prove fatal.18

All personnel in the participating hospitals are required to wear cotton clothing, and visitors in the suites are restricted.

"All personnel entering anesthetizing locations must be in electrical contact with the conductive floor through the wearing of conductive footwear." Hospital D2, the only hospital in this study with a known conductive-type floor, requires its personnel to wear shoes with conductive leather soles and heels. No other hospital has similar requirements

despite the possibility of percussion sparks from shoes having ferrous nails which may contact the floor and thereby becoming a source of ignition for combustible anesthetic agents. "Conductive floors are of no value unless all equipment and all personnel who work in the operating room are properly grounded to this floor."

Five hospitals use the Horton Intercoupler in an attempt to dissipate static potentials from a variety of sources. Under the new standards this is not an approved grounding device.

Recommendations of the National Fire Protection Association for safe practice in anesthetizing locations do not prohibit categorically the use of electrocautery, high frequency equipment, or low voltage instruments. However, the standards describe to the surgeons the additional risks involved in the use of cautery during operations in which combustible anesthetics are used. It also states that if cautery must be used, "a barrier will be provided between any escape of explosive mixtures to the area in which the cautery is being applied, and in addition provision is made for ventilation of the hazardous zone about the patients' head." This study shows that Dl is

20 Lovell, op. cit., p. 58.
22 Ibid., p. 24.
the only hospital using high frequency equipment that does not also use a "wet towel technique" which serves as an appropriate barrier.

"It is important that the operating room suite be completely isolated from the rest of the hospital, and so located that there will be no traffic through it." In 4 hospitals, due to the location of the Central Supply Room within the operating room suite, traffic is excessive. This is considered hazardous not only from the standpoint of combustible anesthetic agents, but also because of the increase in the number of microorganisms as well as the resulting undue confusion in the department.

Anesthetic agents and drugs vary widely in the participating hospitals. No attempt is made to discuss their use since it is felt that this is the prerogative of the anesthetist, surgeon, and the hospital administrators. D1 is the only hospital using Helium with Oxygen. Cyclopropane is used in only 3 hospitals. GOE via rebreathing techniques is used in all but 2 of the hospitals. Open drop Ether is administered in all hospitals. Vinethene is used for inductions in all but 1 hospital. Nine hospitals use endotracheal techniques. Sodium Pentothal is used in all hospitals as is local anesthesia.

23 Neil F. MacDonald, op. cit., p. 31.
Hospital L does not give spinal anesthesias; all others do. Ethyl Chloride is used in 7 hospitals, and Curare is used in 10.

An obvious and, hence, less frequent cause of the ignition of flammable anesthetic agents is by open flame or hot materials at or above their ignition temperature. The lowest ignition temperature of any of the anesthetic agents is that of ethyl ether, 180°C (356°F). The most effective safeguard against this source of ignition is a constant awareness on the part of the operating room personnel of the danger inherent in the use of flammable anesthetics.24

This principle is quoted at length because Hospital M is violating this principle and thereby placing the lives of patients and personnel in jeopardy. In their sterilizing room, which adjoins the main operating room, a gas plate with 4 burners, a large autoclave, and a water sterilizer are all controlled by means of open gas flames which are in close proximity to highly combustible anesthetic agents. "Any open flames must be absolutely prohibited, even at considerable distance from the operating room, as air currents may carry an explosive mixture of gases some distance from its source."25 Several hospitals flagrantly violate the principle by not prohibiting cigarette smoking in or near the operating room.

The recommendation for ventilation of anesthetizing locations does not consider mechanical ventilation a positive protection against anesthesia explosions and does not require mechanical ventilation as

26 Loc. cit.
mandatory in anesthetizing locations. Ventilating equipment, if installed, should be kept in operable condition, and continually operated during surgical procedures. 27

D2 is the only hospital whose operating rooms are equipped with air conditioning. Temperature is maintained at 80° and a relative humidity at a minimum of 55 per cent. According to United States Public Health standards, this is ideal. Hospitals T and D1 have some type of ventilating system, but in the latter, the system is not functioning. Hospital F has a small air conditioning unit in the operating room workroom. In Hospital L, an electric fan is built into and completely enclosed by the wall except for a vent which is situated at the baseboard level. The possibility of these currents stirring up microorganisms as well as recirculating the air in the room is considered hazardous.

There is graduate nurse supervision in all of the operating room workrooms. However, Hospital D1 has no adequate method to differentiate between sterile and unsterile supplies. The criteria currently used is the placement of the packages on specific parts of a shelf, since there are places set aside for sterile and non-sterile goods. This practice is considered hazardous because an error in placement of a package may result

28 Neil F. MacDonald, op. cit., p. 32.
in serious consequences to the patient. Marking of sterile goods is strongly recommended. Seven hospitals in this study use a lead pencil mark, 2 use wax crayon, 2 use cardboard tags, and 2 use indelible pencil. Labelling with a soft lead pencil is to be preferred since the markings are easily removed in laundering.

Although it has been proved that metal dressing drums serve only as hazards in an operating room, 3 hospitals are currently using them to sterilize all or a portion of their linen and dressing supplies. It has been shown that the impervious side walls and bottom prevent the escape of air, inhibit the free flow of steam, and hinder penetration which is vital to sterilization. At the time of this investigation, another hospital was also violating this principle, but, as a result of the consultation, a more satisfactory method was found.

Diacks and Sterilometers, two types of sterility indicators, are currently being used in the participating hospitals. Ten hospitals use Diacks, a pink bead enclosed in a small, expendable glass tube, placed within a bundle before sterilization. Upon termination of the sterilization period, if the bead has melted, the goods are presumed sterile. Walter's experimentation shows marked discrepancies between individual controls.

30 Ibid., pp. 72 and 128.
The majority of the 1000 beads tested melted in one minute or less when exposed to saturated steam at customary sterilizing temperatures. ... A number showed a melting point delayed sufficiently to cause undue waste in sterilization, if sterilization was repeated under the erroneous assumption that the unmelted bead indicated failure of sterilization.31

One hospital uses the Sterilometer, a paper tab upon which is a printed replica of a thermometer. Gradual color changes within the column due to contact with steam of sterilizing temperatures are presumed to indicate sterility of the package. Walter's tests show that

...the majority of the 1000 tested showed complete color changes in less than 6 minutes, and the average changed well below the advertised and published claims. There was a sufficient number of delayed matchings to cause frequent needless sterilizations.32

Three hospitals use no sterile controls.

According to Walter, a reliable control for steam sterilization is by means of an automatic "recycling, synchronous electric timer which is controlled by sensitive thermostats in the exhaust line of the sterilizer." This device avoids the variability of human interpretation and insures "absolute sterility of surgical supplies without waste of steam or damage to fabrics because of excessive exposure to steam."34

31 Ibid., p. 84.
32 Ibid., p. 85.
33 Ibid., p. 82.
34 Ibid., p. 83.
Hospital D is the only one in this study that has such a device attached to an autoclave. However, in this hospital the values inherent in this method are negated by the current use of metal drums for sterilizing linen and dressings instead of wrappers which permit full steam penetration.

Regarding bacteriological checks on the efficiency of the mechanical equipment, 2 hospitals "occasionally" swab a random sterile package and have it cultured in the laboratory. Hospital T carries out this procedure once a month. A more satisfactory method is to use a known culture. "To test the efficiency of the sterilizer, place a culture of known bacilli, such as B. typhosus, in the autoclave, and then make a laboratory examination to recover the organism after sterilization." 35

Eleven hospitals make no attempt to check on the efficiency of their sterilization methods, and, although the above method was described in detail, in some instances it is questionable as to whether the concepts were entirely understood.

Indications of the lack of understanding of basic concepts is apparent in the wide variations in the length of time goods are exposed to sterilizing processes. For example, the findings show that instruments are autoclaved from 30 to 45 minutes or boiled from 20 to 30 minutes, linen bundles are autoclaved from 30 to 45 minutes, brushes are autoclaved or boiled from 10 to 30 minutes, rubber goods and gloves are auto-

35 American College of Surgeons, op. cit., p. 43.
claved or boiled from 15 to 30 minutes. Hospital L is unique with its wet glove technique. Since there are a number of factors which influence the efficacy of any sterilization process, all methods and timing standards should be based on scientifically proved principles based on frequent, regularly scheduled bacteriological examinations.

In 5 hospitals, talcum is being used as a dusting powder for surgical rubber gloves while 13 hospitals prefer Bicosorb, a potassium bitartrate preparation. Many hazards are known to exist because of the use of talcum. It has been proved that although talcum is universally used in the aseptic preparation of gloves, it is by no means a universal practice for surgeons to wash the surface talc off the gloves before beginning to operate. Moreover, this surface talc washes off only with the greatest difficulty, and, even then, not completely. Cases of postoperative complications directly traceable to talcum are cited showing granulomas, adhesions, obstructions, and foreign body reactions due to accidental entrance of talcum into vital visceral organs. In contrast to talcum with its heavy bacterial and spore content, the bitartrate is actually bacteriostatic and relatively innocuous from the point of infectivity, even before sterilization. Bitartrate meets all the physical requirements imposed by sterilization in that it is readily and

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harmlessly disposed of by the body tissues and fluids, and it has no ill effects on either latex or synthetic rubber gloves.

Types of sutures used in an operating room vary with the preferences of surgeons. For this reason, a detailed analysis is not made. It is merely mentioned that in 2 hospitals catgut is used almost exclusively, whereas 4 hospitals use no cotton sutures. Hospital L is unique in its use of horsehair sutures, and in 9 hospitals cotton, silk, nylon, wire and catgut are used.

Chemical disinfection of skin, instruments and equipment is a highly controversial subject which this study does not seek to solve. However, current practices are compared against known standards. 50 per cent of the hospitals participating in this study use Zephiran Chloride aqueous solutions of 1:1000 dilution. This agent is effective in killing vegetative bacteria in 30 minutes and spores (Cl. tetani) in 48 hours.

More hospitals should be familiar with Roccan, the commercial preparation of Zephiran, which is recommended for disinfection of furniture and instruments. Five hospitals use Bard Parker or a solution of similar formula for the disinfection of instruments. These preparations contain solutions of formaldehyde.

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39 Carl W. Walter, op. cit., p. 28.
which make them highly desirable as disinfecting agents. They are capable of destroying vegetative organisms in 20 minutes and spores in 3 hours.

Other chemical agents currently being used in the participating hospitals include mercury oxycyanide, cystane, metaphen, mercury cyanide, merthiolate, mercresin. These preparations, according to Walter, unless used carefully cannot be depended upon to disinfect instruments.

Alcohol is a chemical agent which is commonly used in all hospitals. Hospital M, using a 95 per cent solution for the disinfection of cystocopes is violating an important principle. It is known that alcohol is effective as a disinfectant because of its ability to coagulate bacteria (proteins).

If the alcohol is 95 per cent there is little germicidal action because a protective formation or envelope keeps the alcohol from passing through the protein, and at the same time withdraws water from the bacteria. ... A 70 per cent solution is generally used in hospitals because at this concentration bacteria are killed almost immediately.42

Hospital D2 uses a solution of hypochloride 1:1000 for the disinfection of floors and furniture in the operating room. Walter considers this a powerful disinfectant.43

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40 Carl W. Walter, loc. cit.
41 Ibid., p. 29.
In the 6 hospitals where radium or radon tampons, needles, or seeds are used, the care, use, and disposition of radioactive substances is considered adequate. This evaluation is based on instruction to all personnel as to the handling of radium and precautions to be observed, and the method of sterilization and disposition of these substances.

Twelve hospitals have satisfactorily resolved the problem of infusion reactions and find it more profitable to use commercially prepared, sterile, disposable intravenous sets. Hospitals D and F use the conventional type of latex tubing sets, but their methods of cleansing and preparing intravenous apparatus are incompatible with Walter's investigations.44

Hospital T transports major surgical cases to the operating room in their own beds since they feel that there will be less possibility of postoperative hemorrhage if patients' movements are minimized. Eleven hospitals use a wheeled litter to transport patients, while 2 hospitals, lacking elevators, resort to canvas litters. In the latter hospitals, whenever possible, the patient walks. In 8 hospitals, a member of the operating room staff brings the patient to surgery, and in 4 hospitals, Ward personnel has this responsibility.

Caesarian Sections are performed in the operating rooms of all the participating hospitals. Deliveries are excluded from all operating rooms except in Hospital L. Here, because

44 Ibid., p. 285.
there is no other acceptable place in the hospital for such procedures, a room in the operating room is kept exclusively for this purpose.

In 6 of the institutions, their own hospital laboratory processes and examines routine surgical specimens. Eight hospitals do not have such a department but they have allied themselves with other hospital laboratories for this purpose. Five hospitals have pathologists and equipment available with which rapid or frozen section examinations of tissue can be made without special notification. Five other hospitals may have this service only if 48 hour notice is given the visiting pathologist. Four hospitals have made no arrangements for such a service.

Six hospitals face the problem of washing out bloody linen before it is sent to commercial laundries. In 6 hospitals the gauze from clean surgical procedures is reclaimed and used again as cleaning cloths and pressure dressings. Some hospitals feel that this is not an economy measure since it is too time consuming to be profitable.

Hospital F is the only hospital where an abdominal laparotomy instrument kit is not available for emergency use. On the other hand, there are 6 hospitals that currently do not have an emergency tracheotomy set available. It is felt that this is a greater error than the former because when the need arises for the use of a tracheotomy set, be it for edema of the glottis, diptheritic membranes, paralysis of the vocal cords,
or for any obstruction during or after operations on the neck, the need is immediate. Such a set should be kept sterile and easily accessible even though it may never be used.

It is a rule in all hospitals that sponge counts are done for all cases where the peritoneum is opened. This is an additional safety measure since all hospitals do not use radiopaque sponges.

Cases are set up using forceps technique in 9 hospitals; whereas in 5 hospitals, nurses are assigned to scrub-up and arrange the tables. The former method is considered hazardous for the obvious dangers of contamination.

Master table technique, a method whereby one large, fully equipped sterile table serves to supply goods and instruments for several cases, is not used in any of the hospitals.

Scrub nurses in three hospitals cleanse the patients' operative site with chemical agents. In 2 hospitals she also places the sterile linen over and around the operative area. Most hospitals delegate the responsibility for prepping and draping the patient to the surgeon and his assistant. In all hospitals scrub nurses, one or two depending on the type of procedure and the size of the nursing staff, pass instruments and sutures to the surgeon.

The duties of the circulating nurse, in 4 hospitals, include prepping the operative site. This is not the procedure of choice since there is a danger that microorganisms from the operator's hands may be transferred to the patient. In all of
the hospitals the circulating nurse serves to set-up the rooms, position the patient with the help of the anesthetist, and to service the team.

In 85 per cent of the hospitals, the cleansing agent used to disinfect the hands of the surgeon and his team is a detergent combined with a bactericidal agent most commonly referred to as G-11 and officially designated as Hexachlorophene. The superiority of these newer products over the conventional surgical scrub technique has been shown in many studies. One study proved that a detergent with G-11 "will cleanse, lower the bacterial count of the skin, reduce skin irritability, save time, and not increase the incidence of wound infections." Another investigator showed that a 3 minute brushless cleansing with a G-11 agent is more effective than a routine 10 minute surgical scrub. All hospitals in this study, however, use brushes. In only 2 hospitals, the routine 10 minute surgical scrub is practiced. Two other hospitals use the G-11 preparations but keep soap available for surgeons who prefer this method. In all hospitals the length of time for surgical scrubs ranges from 3-10 minutes.

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Masking is the only effective technique for controlling the discharges from the nasopharynx. ... The problem is not the control of the individual organisms which may be expired, but rather the removal of gross droplets of saliva or mucous expelled during forced expiration ... Metal strips may be fashioned to fit the nose to prevent fogging of glasses. ... Masks should fit the face snugly so that air is forced to filter through the mask."\(^47\)

Detailed consideration is given this subject since it is felt important to clarify these principles for several surgeons in the participating hospitals who feel that covering the nose with a mask is an unimportant detail.

Satisfactory types of headgear are being used in all hospitals. Although some nurses prefer bandanas, others helmets, and others like doctor’s caps, in all cases care is taken to keep the hair well covered.

It was found that in the 5 hospitals with schools of nursing, both Walter’s and Alexander’s texts, two books which have been used extensively in this study, are available for reference. \(^48\) Of the other 9 hospitals, only 2 have one of these books. No other references are currently being used as guides to operating room nursing practices.

Procedure books are found in all but 2 hospitals. Although they vary in type, some being carefully catalogued and others

\(^47\) Carl W. Walter, op. cit., pp. 189-191.

\(^48\) Ibid. See also Edythe L. Alexander, Operating Room Technique, (St. Louis: C. V. Mosby Co., 1949).
pencil written in notebooks, the principle regarding the importance of such a ledger is recognized.

Anecdotal records are effective tools "to obtain the type of information that could be used for more objective evaluation of students." Although these records are not currently being used in the hospitals with schools of nursing, when the advantages of the records were explained, the groups responded enthusiastically.

Policies within the participating hospitals do not include progress or efficiency reports on graduate nurse personnel. In a few cases it was learned that the only indication of satisfactory performance was in terms of continued employment. Whether the report be written or oral, it is felt that administrators should recognize that one of man's basic needs is to achieve a measure of success and satisfaction in his work and to know that his contribution is important to the group.

None of the hospitals use the job analysis tool to define the specific functions and activities of professional and auxiliary workers in the operating room. When the subject was discussed with operating room supervisors, many failed to see the need for such detailed records. "There is probably no area in nursing service that has been more neglected than the analy-


sis of jobs. Misunderstood by nurses or ignored by them, job analysis remains a tool which is yet to be used by most supervisors and administrators. Each nurse interviewed explained that her respective job was described verbally, and several nurses added that the job description given at the time of original employment scarcely resembles their current responsibilities.

Guided Interview

Interview technique was used to secure data that could not be obtained through the less personal procedure of distributing reply blanks. To ascertain opinions, beliefs, and attitudes of individuals about their respective jobs in the hospital, 12 operating room supervisors and 30 operating room staff nurses were interviewed. The length of time spent in each of the 14 hospitals averaged 6 hours, but in the larger institutions 10-12 hours were necessary. To satisfy one of the principal purposes of this study, five questions were carefully prepared in advance of the meetings.

1. Do you enjoy your present work? Why?
2. Would you rather be doing another job?
3. To whom are you responsible in your job?
4. Do you work well with others?
5. What changes would you make in this department if you could?

It will be remembered that visits were made to each hospital in response to a need which was indicated on the Questionnaire. In several instances, however, the operating room staff was unaware of the fact that the invitation had been extended. As a result of this, there was much resistance to the presence of a visitor and normal defensive barriers became readily apparent. Securing rapport within these tense, emotional settings was a challenging task. With each interviewee the study was explained and the situation carefully structured. After a few unsuccessful attempts, the best approach was found to be as follows:

I am an operating room nurse who was sent here through the Bingham Associates Program to try to help you with your operating room nursing problems, if any. It is not my intention to embarrass you or to criticize any current practices, but we may be able to think through together ways by means of which you may improve your efficiency. My position as a consultant carries no authority, and you may feel free to accept or reject my suggestions. Please understand that the information gained by this visit will in no way be associated with you as an individual.

In 2 interviews, rapport was not established. The first was with an interviewee who was a fanatic for whom everything in her personal and professional life had a religious connotation. In the second case, despite all of the structuring to the contrary, the interviewee viewed the interviewer with great suspicion and as a threat to her security.

After a brief orientation to each operating room suite with opportunity to observe the operation of the department, the
interview was begun in a pleasant, informal manner. The previously mentioned questions, varied to adapt them to individual circumstances, were introduced into the conversation at appropriate points. Questions were amplified and leads were followed up as the occasion suggested. In this manner, the following information was obtained:

On the supervisory level, 10 nurses out of 12 expressed sincere interest and showed great pride in their work. In her own way, each nurse manifested a wholesome discontent regarding several current practices and policies which she would like to change. They were extremely receptive of new ideas and appreciative of any guidance which would help toward improving their situation. It is interesting to note that in answer to the third question all of the operating room supervisors working in small hospitals said that they were responsible to the director of nursing or the director of the hospital. (In most instances, this is the same person.) In the larger hospitals most supervisors stated that they were responsible to the chief of the surgical service. However, it was in these larger hospitals that this question was followed by comments which elicited attitudes ranging from mild degrees of concern, fear, or apprehension, to acute anxiety manifestations projected against the immediate superior. Since it was not possible to interview the chiefs of each surgical service, it is difficult to determine whether these attitudes were wholly due to the basic insecurities of
the individual, or if the situation is aggravated by the emo-
tional inadequacies of the surgeon. Only one supervisor was
able to speak with ease about her chief giving no evidence of
tension or insecurity. According to accepted standards, "the
supervisor of the operating room is responsible to the director
of nursing of the hospital for the management of this depart-
ment."

Explaining why they enjoy their work, again a dichotomy
is found between the responses from nurses working in small
hospitals and those in large institutions. Some nurses from
small hospitals expressed personal satisfactions derived from
caring for patients who were their friends and neighbors. In
larger institutions the reasons for enjoying work were described
in terms of material gains.

In some small hospitals, there are a number of married
nurses who have home and family responsibilities. The majority
of these women feel the latter to be their primary obligation.
It was therefore not unusual that the suggested changes that
these nurses proposed were in accord with measures which would
facilitate homemaking rather than those which would expedite
the functioning of the department. Incidentally, it was sur-
prising to learn that one hospital pays its operating room
nurses at the rate of $0.72 per hour!

Nurses in larger institutions stated that although they

52 American College of Surgeons, op. cit., p. 39.
enjoyed this type of nursing, there were several sources of discontent, i.e. lack of appreciation from surgeons and from the administration, long hours of work, poor salaries, frequent emergency Call schedules, lack of organization as well as orientation to the operating room. During these conversations, the interviewer used these opportunities to give information and to help develop more acceptable attitudes on the part of the respondents. In the teaching hospitals, the most frequent comment was, in effect, "I'm expected to know much more than I do know. I'm afraid to show my ignorance by asking questions." Others stated that although they were supposed to teach basic students, there wasn't time for even superficial explanations.

None of the needs expressed or implied are unique to nursing as a profession. According to Maslow, all of mankind has basic needs which must be gratified, i.e. need to belong, need for achievement, self-respect, self-confidence, security, safety, protection, love. "Hostility is born from frustration. Gratification is born from friendliness."

To secure objective opinions as to ways whereby the operating room might serve the needs of the hospital more effectively, 7 Hospital Administrators were interviewed. Four of them were also Nursing Directors, and 1 was the operating room Supervisor, as well as the Anesthetist. Of this group

53 A. H. Maslow, op. cit.
54 Ibid., p. 404.
Administrators were unaware of operating room problems and confidently stated that the department was functioning well. Investigation proved this statement to be contrary to fact, and that the departments reflected the attitudes of the administration.

One hospital Administrator held a defeatist's attitude toward the operating room situation. Stating that although the problems were legion, budgetary limitations demanded that he cope with poorly prepared and limited personnel if only to maintain the status quo. He challenged any type of educational program that might be made available to his nurses for fear of losing them to larger institutions.

The last Administrator interviewed evinced real concern over the problems of the operating room, and earnestly sought ways whereby the department could function more effectively. He presented the nurse shortage problem and explained the difficulties civilian institutions face in trying to maintain a stable staff while Veteran, Military, and State Hospitals can offer a much more attractive wage scale to their employees.

Four Directors of Nursing, eager to improve their operating room situation, overwhelmed the consultant with hospitality. They welcomed the opportunity to discuss their problems, and appeared grateful that someone was interested in helping them. Their main areas of concern were: (1) Basic Student education, (2) Personnel policies, and (3) operating
room management which would build up the morale of the group.

In the course of the hospital visits, 6 doctors were inter­viewed. Three of them were extremely reluctant to offer opin­ions for fear of being quoted. When they were assured that no identifying data would be found in this portion of the study, they commented freely, albeit unfavorably, about nursing edu­cation. Although these men worked in separate hospitals in different parts of Maine, it was as though they came from the same school. In essence they agreed that no nurse today can equal those "In the good old days." The "efficient" nurse was described as one who works hard, does as she's told, asks no questions, doesn't watch a clock, or worry about her pay.

Three other surgeons were more constructive in their analysis, and pointed to specific areas that could be improved in the department. They each encouraged some type of refresher course experience for their operating room nurses since they felt that this would be of lasting benefit to the nurse, to the doctor, and to the patients.
CHAPTER IV

SUMMARY ABSTRACT, CONCLUSIONS, AND RECOMMENDATIONS

Summary Abstract

This is a survey of the needs of operating room nurses in 28 selected hospitals. Three devices were used in collecting data. In 28 hospitals, a questionnaire was used to gather factual information pertaining to structuring, personnel policies, staffing, and types of surgery performed. Following through in 14 of these hospitals, a check-list was used for directed observations of procedures, techniques, and physical plant; and guided interviews were used to ascertain attitudes, opinions, and beliefs of selected operating room nursing personnel. The findings indicate that the needs of operating room nurses functioning in small hospitals are common to those in large hospitals varying only in degree. Needs felt by all personnel are man's basic social and emotional needs; those needs not recognized by nursing personnel are concerned with the dynamics of human behavior, and the understanding of and application of basic scientific principles. Quality of physical facilities may militate against safe care of patients in an operating room. Quality of the nursing service rendered is measured in terms of the preparation and experience of the nursing personnel. Re-evaluation of current basic operating room nursing programs is needed if the student
is to understand the continuity of patients' experiences. Recommendations are made to improve interpersonal relationships between nurses and doctors and nurses and administrators by means of improved orientation programs, in-service education of staff nurses, and group planning of essential operating room activities. Suggested measures to improve the quality of operating room nursing services include direct operating room nursing consultative services to each hospital, development of short Institutes and Workshops in operating room nursing, development of short refresher courses in this area of specialization, and the establishment of inter-hospital councils of operating room nurses.

Conclusions

It is important at this time to reaffirm one of the objectives of the BK-BU program which is to improve the quality of medical and nursing care given patients by developing channels along which help may flow in the form of assistance, advice, and consultative services. The operating room nurses in the 28 hospitals participating in this study have given ample evidence of their readiness to accept help and to improve themselves. The conclusions and recommendations which follow have been designed to constructively implement this objective.

In terms of the purposes of this study, and based on the findings and investigation, the following conclusions are made. Where applicable, remedial measures are suggested to hospitals.
General Conclusions.

A. The questionnaire as a device for gathering information was not entirely satisfactory. Frequently data were omitted and questions misinterpreted.

B. Following-through with a check-list and interviews, more accurate and pertinent data was provided, which, when compared against accepted standards, made this study significant.

C. This is only a partial study because the diversity of the data precludes the accuracy of conclusions which are so generalized that they would be applicable to the participating hospitals that were not visited.

Conclusions in Terms of the Purposes of this Study.

A. The felt needs as expressed or implied by the operating room nursing personnel are a need:
   1. for self-confidence (emotional security)
   2. to be appreciated and understood (self-respect)
   3. to be an important part of the group and to be respected by others (belonging and love in its fullest sense)
   4. to be free from tensions and abnormal fears (safety)
   5. for shorter hours and better pay (economic security)
   6. for better planning of work to give more time to learning and teaching (achievement and success)
7. for guidance and direct assistance in planning and carrying out work.
8. for opportunities to collaborate with other operating room nurses in their region.

B. It would appear that the following needs are not recognized by most of the nursing personnel. A need to:
   1. understand the dynamics of human behavior, i.e. themselves, patients, colleagues, and co-workers
   2. understand the basic scientific principles related to patient care in this specialized area (patient-focused), and microbiological principles of asepsis.
   3. have group planning of work activities, in-service education programs, develop esprit de corps
   4. understand resource materials relating to fire hazards, safety standards, sterilization guides
   5. have better utilization of ancillary workers.

C. The quality of the physical facilities of the operating room.

   1. During the preliminary investigation, it was established that 20 of the participating hospitals had been approved by the American College of Surgeons. Based on the findings of this study, D2 is the only hospital that meets all of the criteria developed by the American College of Surgeons, National Fire Protection Association, and United States Public
Health Service. In all other hospitals, one or more factors militate against approval by current standards.

2. Although in several hospitals, one or more operating rooms measured less than the desirable minimum standard, it was found that in all cases investigated, these rooms were used for minor procedures where a minimum amount of equipment permitted satisfactory utilization of floor space for the safe care of patients.

3. In Hospitals Z, V, and O, where the central supply room is an independent department servicing the needs of the hospital exclusive of the operating room, there is need for reorganization. For the advantages already given in this study, it is recommended that the central supply room should be enlarged and equipped to service the total needs of the hospital inclusive of the operating room.

4. The central supply rooms in Hospitals T, D1, F, and M, are located in the center of the operating room suite thereby creating the obvious hazards of excessive traffic and undue confusion. It is recommended that plans be formulated whereby the central supply room may be moved to a more suitable place at the end of the operating room suite; or, preferably, that the central supply room be made an
independent department located outside of the operating room suite.

5. In 85 per cent of the hospitals, sterilization controls are inadequate. It is recommended that the machines be checked regularly for mechanical and technical competence, and that reliable methods be used to control and assure the sterilization process.

6. In Hospitals T, D1, and D, the metal dressing drums currently used for sterilization of goods and supplies should be discontinued. It is recommended that the drums be replaced by wrappers which permit full steam penetration.

7. In Hospitals T, Z, and F, a resuscitator is not a part of the operating room equipment. Since it may serve as a lifesaving measure, it is recommended that this apparatus be purchased.

8. In approximately 85 per cent of the hospitals, there is flagrant disregard of the hazard of smoking in the operating room. It is strongly recommended that personnel refrain from smoking in or near the operating room and that the administration strictly enforce this regulation.

9. Anesthesia rooms and recovery rooms are not considered mandatory requirements in an operating
room. In view of their many advantages, however, it is recommended that administrators carefully weigh the merits of these facilities in consideration of future plans.

10. Hospital M is the only hospital currently operating with the obvious hazard of open flames in close proximity to combustible anesthetic agents. It is strongly recommended that all mechanical sterilizing apparatus in this hospital be converted to steam or electric controls.

11. In 57 per cent of the hospitals electrical installations do not meet the requirements of the National Fire Protection Association. It is recommended that explosion-proof outlets be installed; or that the conventional arc-type switches and open plugs be moved above the 5 foot floor level.

12. D2 is the only hospital with a known conductive-type flooring. It is recommended that all hospitals determine the conductivity of their operating room floors through consultation with a person competent in this area. Where floors are found to be non-conductive, it is further recommended that arrangements be made whereby they will meet the National Fire Protection Association standards.

13. D2 is the only hospital that has considered every known means to protect patients and personnel from
explosions. It is recommended that all administrators begin planning for a fully conductive environment in the operating room where all personnel and equipment are well grounded and where new regulations are fanatically adhered to so that the conductive chain will be assured.

B. Quality of nursing personnel in terms of their functioning, preparation, and experience.

1. It would appear that in most hospitals there is a limited understanding of teamwork relationships which demonstrate the inter-relatedness and interdependence of one worker with another. It is recommended that operating room service committees be formed, meeting at regular intervals, to discuss problems pertaining to the department as well as the improvement of patient care.

2. In the small community hospitals, because of their nature and close relationships, patient-focused services are intuitively practiced. It would appear that in the larger hospitals there is little relationship between the operating room experience and the patient's total hospitalization. It is recommended that continuing in-service education programs, held at regularly scheduled intervals on duty time, be planned so as to interpret the concepts of continuity of patient care. It is further
recommended that plans be formulated whereby there will be a follow-through on patient care pre-operatively and postoperatively by operating room nursing staffs.

3. Advanced preparation of nurses in this area of specialization is limited.

4. Insufficient data precludes an accurate tabulation of amounts and kinds of operating room experiences the nursing staffs have had.

5. Fifty-four per cent of all the operating room graduate nurses employed in the 28 hospitals want a refresher course in operating room nursing if one is offered at NECH.

6. There is an abundance of learning experiences available at NECH. However, there is need for a continuing in-service education program for the NECH operating room personnel to prepare them for future refresher course programs which may be offered in this institution.

E. Type of administrative organization.

1. In all hospitals there was little formal evidence of group planning regarding policies, procedures, and techniques, or regularly scheduled in-service education programs for staff nurses.

2. The emotional tone of the environment in Hospital C excelled all others in its warmth, friendliness,
and lack of tension.

3. It would appear that in most of the hospitals personnel policies are not sufficiently defined in terms of employee growth and satisfaction.

4. It would appear that a nucleus of democratic organization exists in each hospital, but that it has not yet reached full fruition.

5. The potentialities for developing within the operating room suite, a team relationship which could, in effect, be felt throughout the entire hospital have not been fully developed.

6. In most hospitals there is an acute shortage of qualified operating room nurse personnel. It is recommended that carefully selected non-nurse personnel who have manifested an interest in this specialized area be trained to serve as scrub technicians.

F. Potential source of supply of future operating room nurses in terms of basic nursing preparation.

1. The objectives of the basic student operating room nursing experience need re-evaluation.

2. In most hospitals the operation is considered as an isolated fragmentary experience of the patient, rather than as a part of his total surgical experience.
3. It would appear that, in most hospitals, the content of basic operating room nursing instruction is designed to teach the acquisition of manual skills, and it neglects the important scientific principles upon which this type of nursing is based.

4. There is evidence to show that most of the current operating room nursing instructors have limited preparation or lack sound experience for this important task.

5. Current operating room nursing instructors want and need help in reorganizing and revamping present curricula, and in utilizing newer teaching methods.

Recommendations of the study.

A. Since the major conclusions of this study are based primarily upon the follow-through of the questionnaire with check-list and interview data gathered in only 14 hospitals, it is recommended that similar studies be undertaken for the other hospitals in the affiliation when they signify a need for this assistance.

B. It is recommended that the Bingham Associates consider the appointment of a full-time operating room nurse consultant who could not only teach but also make extended visits to each hospital giving direct assistance. There is evidence to show that operating room
nursing consultative services have not only alleviated problems of immediate concern, but, in many hospitals, have also expedited plans for the future.

C. Since the need is great for educational experiences on the graduate nurse level, and since the nurses have indicated a desire for such experiences, the following methods of disseminating information are recommended:

1. Periodic 4-week refresher courses to be given at NECH. The content of this course, as indicated by the potential students, could stress specific areas in the following order:
   a. Principles and practices of operating room nursing.
   b. Management of an operating room suite.
   c. Teaching operating room nursing to graduate nurses.
   d. Supervision of an operating room suite.
   e. Teaching operating room nursing to basic students.
   f. Personnel management.

2. D2 has an ideal environment for an educational experience and facilities with which a sound program could be developed. It is feasible to suggest that similar periodic refresher courses could be offered in this institution.

3. Short Institutes and/or Workshops in operating room
nursing given in several strategically located areas would be of value to those nurses who, because of the problem of staffing and coverage in the operating room, would not feel free to leave their jobs for an extended period of time.

4. Establishment of inter-hospital councils of operating room nurses where groups may meet periodically in strategically located areas to discuss common problems with the help of an operating room nurse consultant, exchange ideas and opinions, and learn about the newer trends in surgery. Of the 28 hospitals, 20 (71 per cent) have indicated a desire for such councils.

D. It is recommended that a course be developed under the sponsorship of BK-BU for the training of carefully selected non-nurse personnel to serve as scrub assistants. If such a plan evolves it will be another "first" in New England.
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HOSPITALS PARTICIPATING IN THE STUDY

Athol Memorial Hospital, Athol, Massachusetts
Bath Memorial Hospital, Bath, Maine
Brunswick Hospital, Brunswick, Maine
Calais Hospital, Calais, Maine
Cape Cod Hospital, Hyannis, Massachusetts
Cary Memorial Hospital, Caribou, Maine
Central Maine General Hospital, Lewiston, Maine
Cooley Dickinson Hospital, Northampton, Massachusetts
Eastern Maine General Hospital, Bangor, Maine
Franklin County Memorial Hospital, Farmington, Maine
Henrietta D. Goodall Hospital, Sanford, Maine
Holyoke Hospital, Holyoke, Massachusetts
Knox County General Hospital, Rockland, Maine
Ludlow Hospital Society, Ludlow, Massachusetts
Lynn Hospital, Lynn, Massachusetts
Madigan Memorial Hospital, Houlton, Maine
Mayo Memorial Hospital, Dover-Foxcroft, Maine
Miles Memorial Hospital, Damariscotta, Maine
Mount Desert Island Hospital, Bar Harbor, Maine
Noble Hospital, Westfield, Massachusetts
Presque Isle Hospital, Presque Isle, Maine
Rumford Community Hospital, Rumford, Maine
Scott-Webb Memorial Hospital, Hartland, Maine
Sisters' Hospital, Waterville, Maine
St. Andrew Hospital, Boothbay Harbor, Maine
St. Vincent Hospital, Worcester, Massachusetts
Thayer Hospital Association, Waterville, Maine
Wesson Memorial Hospital, Springfield, Massachusetts
The Bingham-Kellogg-Boston University Nursing Education program is concerned with the improvement of medical and nursing services. Studies are now underway to determine how a regional nursing program can be developed to assist hospitals affiliated with the Bingham Associates Program to improve their effectiveness.

This particular study is concerned with the area of Operating Room Nursing. As a first step, and as a guide to subsequent planning, preliminary information is sought by means of the enclosed questionnaire. On the basis of the factual information secured in this manner, the attempt will be made to determine the basic operating room nursing needs in each of the forty affiliated hospitals. Following classification of these data, visits will be made to selected hospitals for the purpose of supplementing the facts and clarifying the needs. Finally, plans will be proposed whereby the needs elicited can best be met.

Since you may like to retain a copy of the questionnaire for your files, two copies are enclosed. Please complete and return the other to me by Monday, March 19, 1951.

Your cooperation is greatly appreciated and assurance is offered that the conclusions of this study will be meaningful to you and your operating room staff.

Very sincerely yours,
OPERATING ROOM QUESTIONNAIRE

Date

Name of hospital

Address of hospital

Number of hospital beds (Daily average)

Name of Operating Room Supervisor

Directions: Please complete this questionnaire (using checks (✓) where applicable) and return it in the enclosed self-addressed stamped envelope by Monday, March 19, 1951.

1. How many rooms are in your operating room suite? ________
   A. How many of these are used for surgery? ________
      a. List the dimensions of these rooms (in feet):
         1. ________________
         2. ________________
         3. ________________
         4. ________________
         5. ________________
         6. ________________
   B. Dimensions of the Nurses' Workroom (in feet):
   C. Is there a Central Supply Room? Yes ___ No ___
      a. Is it a part of OR suite? Yes ___ No ___
      b. If elsewhere in hospital, please specify
      c. Is it under the direction of OR staff? Yes ___ No ___
   D. Do you have Anesthesia Rooms? Yes ___ No ___
      a. How many? ________
   E. Do you have a Recovery Room? Yes ___ No ___
      a. Is it under the direction of OR staff? Yes ___ No ___

2. Total number of operations performed from January 1, 1950 to January 1, 1951: ____________

   Service__________________________   Number of operations
   Jan. 1, 1950 - Jan. 1, 1951

   General surgery ____________
   Gastric surgery ____________
   Urologic surgery ____________
   Neurosurgery ____________
   Thoracic surgery ____________
   Gynecologic surgery ______
   Orthopedic surgery ______
   Ear, Nose, Throat surgery ---
   Eye surgery ______
   Plastic surgery ______
   Cardiac surgery ______
   Other (specify) _______

3. Please attach to this questionnaire a list of all the operations performed during the month of January 1951. (List the names of the operations and their frequency.)

4. What is the average number of operations performed per day? ________
   per week? ________

5. Approximately how many emergency operations are performed after 7PM each week? ________
6. Your usual operating room schedule generally extends from _____AM to _____PM.

7. In the list of mechanical sterilizers below, indicate the number of each type you are using. Place an "O" where none applies:
   - Large-chamber autoclave _____
   - Small, speed autoclave _____
   - Water sterilizers _____
   - Oil sterilizers _____
   - Pressure-washer sterilizers _____
   - Dry-heat sterilizers _____
   - Other (specify) ________________________________

8. Listing OR ancillary staff, how many Orderlies? ______
   how many Maids? ______
   how many Aides? ______

9. In relation to the rest of the hospital, the operating room is situated (please specify location)
   - _____ Occupies one floor of the hospital.
   - _____ Occupies a part of a hospital ward.
   - _____ Easily accessible from all parts of the hospital.
   - _____ Near X-Ray department.
   - _____ Near Pathology laboratory.
   - _____ Elevators used for transportation of patients.

10. How many graduate nurses are permanently assigned to the OR other than yourself?
    a. If you have a part-time staff that shares general ward responsibilities please specify:

11. List their preparation and/or experience in operating room nursing since graduation:

   (If more space is required, please use the back of this sheet.)

12. Do you have a planned, regularly scheduled In-Service training program for graduate nurses in your department? Yes _____ No _____
    a. How frequently does this group meet? _____ hours per week
       _____ hours per month

13. What are the average hours per week worked by graduate staff nurses?
    a. Average hours per day?
    b. Describe briefly the make-up time policy for graduate nurses who are called for emergency cases:
14. If a short (four week) OR nursing refresher course were to be offered at the New England Center Hospital at a later date, and if arrangements were such that expenses would be paid, how many of your OR graduate staff would be interested in attending?

15. If such a course is developed, in which of the following areas would you suggest major emphasis:
   a. Management of OR suite
   b. Supervision in OR Nursing
   c. Teaching of OR Nursing for Basic Students for Graduate Nurses
   d. Personnel management
   e. Principles and practices of OR Nursing
   f. Other (specify)

16. In what other ways would you suggest that the Regional Nursing Program can serve you in regard to OR Nursing:
   a. Direct help in your situation by an operating room nurse consultant.
   b. Periodic refresher courses in the Regional Hospitals in Bangor, Me., and Lewiston, Me.
   c. Periodic refresher courses in the New England Center Hospital.
   d. Inter-hospital council of OR nurses who meet periodically in each region to discuss problems in OR nursing with help from an OR consultant.
   e. Other (please specify)

Note: If your hospital has a School of Nursing, please answer the following four questions:

17. Who is responsible for teaching the Basic Students' formal classes and their clinical teaching in the OR?
   a. What is her/their preparation and/or experience in operating room nursing since graduation?
18. The Basic Students' formal classes are given:
   a. Correlated with the OR experience? **Yes** **No**
   b. Approximately how long before the OR experience?

   Note: Please attach to this questionnaire a copy of your Course Outline and/or experience plan.

19. Describing the policy of the rotation of Basic Students:
   a. How many times per year are students assigned to the OR? ____
   b. How many students are assigned at one time? ____
   c. What is the length of this experience? ____
   d. Is the experience continuous? **Yes** **No**
   a. What experience interrupts it? (please specify)

   e. Their operating room clinical experience comes:
      _____ Immediately after the preclinical period.
      _____ In the 2nd half of the first year in school.
      _____ In the 1st half of the 2nd year in school.
      _____ In the 2nd half of the 2nd year in school.
      _____ Other (please specify)

20. In your school, is provision made for a Basic Student to return to the operating room in her Senior year if she desires more operating room nursing? **Yes** **No**

   a. What is the nature of this experience? (please describe)
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## Sutures

| Hospital | T | \(D_2\) | \(D_1\) | Z | V | A | F | E | D | C | O | N | M | L |
|----------|---|--------|--------|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cotton** | Same | Same | Same | Same | Catgut | Silk | Cotton | Little | Mostly | Catgut | Little | Silk | Horseshair | |
| **Silk** | | | | | Catgut | | | | | | | | | |
| **Wire** | | | | | Catgut | | | | | | | | | |
| **Catgut** | | | | | Catgut | | | | | | | | | |

## Chemical Disinfectant

| **Bard** | | | | | | | | | | | | | | | | |
| **Formaldehyde** | Parker | phen and | Zeph. | Parker | Meta- | Zeph. | 1:1000 | 1:1000 | | | | | | | |
| **Alcohol** | Bard Park. | 1:1000 | | | | | | | | | | | | | |

## Disinfection of Cystoscopes

| **Mercury** | Aq. | Aq. | Aq. | Alcohol | Aq. | 70% | Alcohol | Aq. | Aq. | Zeph. | 1:1000 | 1:1000 |
| **Cyanide** | 1:1000 | 1:1000 | 1:1000 | | | | | | | | | | |

## Use, care and Disposal of Radioactive Substances


## Care and Preparation of I.V. tubing

| **Disposable** | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable | Disposable |

## O.R. Policies:

| **Transportation of Patients** | Bed for | Litter | Litter | Litter | Canvas | Canvas | Litter | Litter | Litter | Litter | Litter | Litter | Litter | Litter |
| **Bed for maj, cases** | Litter | | | | | | | | | | | | | |
| **Litter** | | | | | | | | | | | | | | |
| **Orderly** | Personnel | Orderly | Orderly | Orderly | | | Personnel | Personnel | Nurse | and aide | Orderly | Orderly | Nurse | |

## Caesarian Sections

| **x** | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

## Deliveries

| o | o | o | o | o | o | o | o | o | o | o | o | o | o | o |

## Call Policy for Nurses

| 2wk. | 1x wk. | 1x wk. | 2x wk. | 1x wk. | Infreq. | 6x wk. | 5x wk. | Infreq. | 2x wk. | 2x wk. | Once | 3-4x wk. | Infreq. | |
| **2wk.** | | | | | | | | | | | | | | | |
| **1wk.** | every | | | | | | | | | | | | | | |
| **3 wks.** | | | | | | | | | | | | | | | |

## Specimens Routine

| **Hospital Lab.** | Hospital Lab. | Hospital Lab. | Hospital Lab. | Hospital Lab. | Sent | Sent | Sent | Sent | Sent | Sent | Sent | Sent | Sent | Sent |
| **Hosp. Lab.** | | | | | | | | | | | | | | | |
| **Sent** | | | | | | | | | | | | | | | |
| **Out** | | | | | | | | | | | | | | | |

## Rapid Sections

| 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. |
| **x** | x | x | x | x | o | o | o | o | o | o | o | o | o | |

## Notice

<p>| <strong>48 hr.</strong> | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. | 48 hr. |
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## Check-list Work Sheet Used in Directed Observations in Fourteen Hospitals

### Physical Aspects

| HOSPITAL | T | D2 | D1 | Z | V | A | F | E | D | C | O | N | M | L |
|----------|---|----|----|---|---|---|---|---|---|---|---|---|---|---|---|

**Floor**
- Tile
- Conductive Tile
- Rubber
- Concrete
- Cement
- Rubber
- Linoleum
- Terrazzo
- Rubber
- Granite
- Cement
- Concrete
- Terrazzo

**Ceiling**
- Plaster
- Acoustic
- Plaster
- Plastic
- Acoustic
- Plaster
- Plastic
- Plaster
- Stone
- 6' Tile

**Walls**
- Plaster
- Conductive 6' Tile
- 6' Tile
- All
- Plastic
- Plaster
- 6' Tile
- Plastic
- Plastic
- Plastic
- Plastic
- Stone
- 6' Tile

**Corners**
- Square
- Round
- Square
- Square
- Square
- Square
- Round
- Round
- Round
- Round
- Square

**Overhead Lights**
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Cracked
- Adequate

**Operating Light**
- Castle
- Castle
- Castle
- Opray
- Beam
- Castle
- Castle
- Castle
- American
- Sterilzr
- Castle
- Opray
- Beam
- Castle
- American
- Sterilzr
- Castle

**Explosion proof Outlets**
- 0
- x
- x
- x
- 0
- x
- 0
- x
- 0
- x
- 0
- x
- 0
- Being
- Installed

**Mercury Switches**
- 0
- 0
- 0
- 0
- 0
- 0
- 0
- 0
- 0

**Emergency Lights**
- Portable Battery
- Portable Battery
- Portable Battery
- Portable Battery
- Portable Battery
- Portable Battery
- Portable Battery
- Portable Battery
- D.C. full
- Supply
- Portable Battery
- Separate
- Current
- One light

**Suction-Wall**
- Portable
- x
- x
- x
- x
- x
- x
- x
- x
- x

**Galleries**
- 1
- 0
- 0
- 0
- 0
- 0
- 0
- 0
- 0
- 0
- l-needs
- Partition

**Inter-communication System**
- 0
- Light System
- 0
- 0
- 0
- 0
- Light System
- 0
- 0
- 0
- 0

**Standard Room Equipment**
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate
- Adequate

**Resuscitator**
- 0
- x
- x
- x
- x
- x
- x
- x
- x

**Electrocoagulation Mach.**
- x
- x
- x
- x
- x
- x
- 0
- x
- x
- x
- x

**Live Cautery**
- x
- x
- x
- x
- x
- x
- x
- x
- x

**Explosion Precautions**
- Cotton Cloth's
- x
- x
- x
- x
- x
- x
- x
- x
- x
- x
- x