THE EFFECTIVENESS OF THREE PREOPERATIVE LEARNING PROGRAMS ON PATIENT RECOVERY AND LEARNING

by

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ABSTRACT

The study reported here was a controlled experiment in which three groups of eleven randomly assigned female patients undergoing cholecystectomy were studied for the effectiveness of three different types of preoperative learning programs:

1. a systematic, planned learning program in which learning objectives, strategies and tests were designed to meet individual patient preoperative learning needs;

2. a planned group learning program which involved a class of patients and discussion of a slide-sound presentation and demonstration of exercises; and

3. an unplanned learning program in which patients experienced only incidental learning objectives.

Since previous research had not controlled for type of surgery, the major question in this study was whether or not the effectiveness of preoperative learning programs as measured by postoperative recovery measures would be a persistent finding in a more rigidly controlled study. In addition to testing for cognitive achievement in all three learning groups, a variety of physiological measurements of postoperative recovery were made and studied in relation to cognitive achievement. The study also asked patients to validate a series of 50 preoperative learning needs and collected data about their cognitive learning styles in a postoperative patient questionnaire.

Contrary to previous research, it was found that the traditional physiological measurements of postoperative recovery used to measure the effectiveness of preoperative learning programs could not be construed as valid, direct measurements of learning. When studied in relation to cognitive achievement scores, these measures did not correlate significantly. Thus, it was concluded that the measures are not valid, indirect measures of effective preoperative learning. There was however, a suggestive finding that the use of analgesic drugs may be a useful indirect measure of effective preoperative learning.

There were no significant differences in cognitive achievement among the three groups, but there was a significant difference between the Individualized and the Incidental Learning Group in relation to the number of doses of parenteral drugs administered. Anaesthetic time also correlated negatively and significantly with the cognitive achievement score and there were significant differences between all three learning groups in relation to anaesthetic time. This latter finding is of value in providing appropriate reinforcement of learning postoperatively. It may be that patients that have a long anaesthetic time will need more reinforcement of learning postoperatively.

Patient validation of 50 preoperative learning needs was conducted and 49 of the needs were rated by all patient groups as more than fairly important. Patients in the Individualized Learning Group had a greater awareness of learning needs and rated learning needs higher than the patients in the other learning groups. Thus patients do not question the importance of preoperative learning.

The data relevant to the patients' cognitive styles showed that patients tended to select the learning approaches which they had experienced and with which they were familiar. The Individualized Learning Group experienced a variety of approaches and probably gave a truer report of their cognitive styles. The most significant finding is that few patients in any of the three groups expressed a preference for a class although many preferred group discussions.

The situational variables frequently encountered in clinical research were further defined in this study. The controls for type of surgery were insufficient and it is recommended that in future studies controls for both doctor and nurse involvement be provided. This study suggests that future research examine the development, implementation and effectiveness of preoperative learning directly. The use of physiological measurements of postoperative recovery as indirect measures of learning should be validated in future studies.

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CHAPTER I

INTRODUCTION

Nursing and medicine have a long history of research in isolating the key factors which determine how a patient may successfully undergo a surgical experience, both physically and psychosocially. In keeping with that research, this study explored the relationship of preoperative educational processes to postoperative recovery in female patients undergoing a cholecystectomy.

In this chapter, the literature will be reviewed for the key factors reported to be involved in successful postoperative recovery. Factors isolated to date include physiological and psychological factors and some data relevant to tools of measurement for these factors have also been reported. This review of the literature is necessary in order to understand the significance of this current study which is to examine the relationship of preoperative educational processes to postoperative recovery.

ANALYSIS OF FACTORS INVOLVED IN SUCCESSFUL POSTOPERATIVE RECOVERY

Modern surgery has a short history of approximately 150 years. During the first phase of its development, the major objective was to make surgery safe and humane. Bleeding, infection and pain were the major obstacles. Achievements, such as the successful anaesthesia of a patient with ether by Morton in 1846 marked the advance of early surgery.

Once surgical techniques and anaesthesia developed to the point where surgery was safe and humane, the second phase of development began; the objective was to make the patient physiologically safe for surgery. Assessment of respiratory and cardiovascular function by means of chest x-rays, pulmonary function studies, electrocardiograms, haemoglobin counts and prothrombin times became common in the effort to insure that the patient was fit to undergo surgery. The preoperative "work-up" or diagnostic investigation is now, not just an accepted, but an expected practice (American College of Surgeons, 1971). The surgeon is expected to correct or control physiological deficits preoperatively as a means of making the patient safe for surgery.

One of the more dramatic changes in surgical care occurred in 1938 when Dr. D.J. Leithauser observed a thirsty and aggressive patient who had been denied water after waking from an appendectomy; the patient got up out of bed by himself and walked to the bathroom where he drank as much as he wanted. The patient signed himself out of hospital the next day and carried on a completely normal life until he had his stitches out in the doctor's office some four days later. This was a stunning incident at a time when patients were kept resting in bed postoperatively for at least two weeks. Subsequent investigation by Leithauser of 300 appendectomy patients who experienced early ambulation showed that the postoperative length of stay had been reduced to an average of 2.2 days (Leithauser, 1946). The principal of mobilization as a central guideline in promoting rehabilitation of the surgical patient revolutionized surgical care and patients began to

walk to recovery. "Stir-up", regimens including deep breathing exercises, coughing, leg exercises, turning and ambulation were studied for their effect on postoperative recovery. A reduction in the incidence of respiratory and circulatory postoperative complications were observed (Leithauser, 1949; Lindeman & Van Aernam, 1971). Subsequently, the teaching of postoperative exercises became a part of preoperative preparation; the effectiveness of this approach has been widely reported (Dripps & Waters, 1941; Hanamey, 1965; Healy, 1968; Lindeman & Van Aernam, 1971; Lindeman, 1972; Mezzanote, 1970).

Preoperative preparation expanded to include an increasing emphasis on psychological as well as physiological aspects. The rising interest in psychological preparation provoked studies of patients' fears and perceptions preoperatively. Carnevali (1961) and Parker, (1964) compared patients' and nurses' perceptions of preoperative fears. Fear of pain and discomfort were mentioned most frequently and fear of the unknown or not knowing what to expect ranked a close second. Part of the fear of the unknown was fear that they had not been told "the whole truth" about diagnosis and/or prognosis. Other fears reported included:

1. changes in body image;
2. separation from normal environment, family and friends;
3. based on knowledge of previous surgical experiences either gained directly or vicariously through family,

friends, television;

4. death;
5. disruption of life plans or style;
6. losing control over one's environment or destiny particularly in terms of the anaesthetic; and
7. financial difficulties.

These studies were small (10 subjects in the Carnevali study and 11 in the Parker study) and largely uncontrolled, particularly for type of surgery.

Subsequently, Miller (1965) studied a larger group of patients including 30 patients undergoing major surgery and 30 patients undergoing minor surgery. She compared the magnitude of concerns expressed in both groups and found that fear of pain and discomfort, the unknown and fear of diagnosis were reported most frequently and in that order in both groups. This study also was uncontrolled for type of surgery.

Ramsay (1972) conducted a large study of 183 male and 199 female pre-surgical patients aged 4-82 years of age. He reported that 73% had pre-operative fears and 62% had anaesthetic fears predominantly; fear of surgery (15%) and other factors (23%) were low. He suggested that since the interviewer was always introduced as an anaesthetist that this may have biased the patients' reporting of fears. However, a closer examination of the anaesthetic fears revealed that most of

them included fear of pain and the unknown as previously reported by Carnevali, Parker and Miller. These anesthetic fears included:

1. morbid fears, i.e. "I won't wake up" - death;
2. induction, i.e. masks and needles;
3. waking up under general anaesthesia;
4. pain during operation;
5. postoperative vomiting;
6. miscellaneous fears, i.e. talking under anaesthesia, and postoperative pain.

In addition, Ramsay found that men and women were equally affected by preoperative fear. Age had a significant influence in that both older (62-82 years of age) and younger patients (4-12 years of age) had a lower incidence of fears than adults, particularly the middle aged adult (42-61 years of age). However, Ramsay's findings can only be considered suggestive since there was no randomized selection and no controls for sex, age or type of surgery.

Weiler (1968) conducted a descriptive study of 100 patients, 60 males and 40 females, over the period of a year; there were no controls for sex, age or type of surgery. The patients placed fear of the unknown as a high priority in evaluating their preoperative instruction.

Using a random start, Graham and Conley (1971) selected 70 patients being admitted for major surgery. Their sample included 50 women and 20 men and was uncontrolled for sex, age or type of surgery. They reported that 48.6% of the patients described themselves as very anxious or frightened the evening before surgery. Fear of the unknown, anaesthesia, and what the doctors would find were the major causes of this fear. Palmer (1965) subsequently developed an instrument to measure patients' perception of impending surgery. This instrument contained 46 items making up a Likert-type rating scale.

The basic beliefs underlying psychological preparation of the patient preoperatively were that anxiety and fear can lead to sympathetic stimulation (Selye, 1950; May, 1950) and, if prolonged, can reduce the effectiveness of the body defense mechanisms in coping with the subsequent trauma of surgery. Elman (1951) stated that surgical patients often suffer from adverse emotional reactions which trigger autonomic responses and, subsequently, increase postoperative nausea, vomiting and urinary retention, as well as lowering the pain threshold. Eckenoff (1956) warned that marked apprehension in a patient makes him a potential candidate for death in the operating room. Ramsay (1972) states that "the arrhythmias commonly noted in patients whose cardiac rhythm has been influenced by emotional overreaction are, paroxysmal tachycardia, premature contractions, atrial fibrillation and flutter and, occassionally, ventricular tachycardia".

He also reported a wide variety of other cardiac pathology caused by fear and anxiety. Fear and anxiety preoperatively came to be viewed as major factors which made the patient unsafe for surgery, caused postoperative complications or complicated the progress of postoperative recovery.

A mass of research relating psychological preparation to successful recovery postoperatively introduced a variety of physiological and clinical parameters of measurement such as postoperative nausea and vomiting, urinary retention, incidence of complications such as wound infection, pneumonia and thrombophlebitis, amount of narcotics administered, changes in temperature, pulse and respiration and length of hospitalization (Dumas & Leonard, 1963; DeLuca, 1962; Egbert, Battit, Welch & Bartlett, 1964; Healy, 1968; Schmitt & Woolridge, 1973; Lindeman & Van Aernam, 1971). These physiological measurements have continued to be used as postoperative dependent measures of anxiety reduction preoperatively. In effect, they are used as measures of psychological adjustment postoperatively. However, as Wolfer pointed out in his review of the literature in 1973, these physiological measurements of postoperative recovery were only assumed to have a dependent relationship to anxiety reduction preoperatively. The nature of the relationship between anxiety reduction preoperatively and postoperative recovery has not been demonstrated satisfactorily in the research reported to date; the findings to date must be considered only suggestive. The lack of more definitive findings may be

attributed in some degree to research which has been predominately poorly controlled, particularly for type of surgery. There has been a tendency to make comparisons between experimental groups, when the groups were not comparable. Subsequently, for type of surgery, generalizations from experimental groups to the population are similarly invalid.

In striving to establish the nature of preoperative anxiety and its effect on postoperative recovery, research is continuing to explore the development of measuring devices, both of preoperative anxiety and of psychological adjustment, rather than physiological recovery postoperatively. Few unobtrusive, valid, and reliable measuring devices have been developed to date.

Graham and Conley (1971) sought to determine whether or not some common signs and behaviors which are generally accepted as physiological and psychological evidences of anxiety could be observed preoperatively with any degree of consistency. They found that increased blood pressure and verbal expressions of fear were the only significant manifestations preoperatively. These findings are consistent with those of Schmidt (1966) and with the position of Rollo May (1950) who wrote that "the neurophysiological aspects of anxiety cannot be understood without constant reference to the question: What is the organism trying to fulfill in its struggle with its environment" (p. 66). Wolfer (1973 supported this approach as well and stated that "physiological indicators (of anxiety) are best used in conjunction with patients' self-reports and nonverbal expressive behaviors" (p. 396).

Some attempts were made to develop nurse-observer rating tools in measuring a patient's psychological state and psychological adjustment. Aydelotte (1962) and Simon (1961) developed nurse-ratings of the patient's mental attitude as part of a large battery of nurse-ratings. These ratings indicated the degree to which the nurse later judged the patient as friendly, understanding, quarrelsome, despondent, cooperative, agreeable, demanding, impatient and so on. Brodt and Anderson (1967) adapted the Aydelotte patient welfare measures and developed nurse-rating scales which included the mental attitude category, defined in terms of denial, surrendered attitude, hostility-anxiety, paronoia and depression. They reported that their scales required greater precision, increased validation, and additional testing.

Other researchers have concentrated on the development of patient self-reporting instruments for the measurement of anxiety preoperatively and post-operative psychological adjustment. Williams, Jones & Williams (1969) and Bruegel (1971) used Cattell and Scheier's Institute for Personality and Ability Testing Anxiety Scale Questionnaire which reliably measures the level of manifest, free-floating anxiety but not the situational or environmentally-induced anxiety involved in a surgical experience. Bruegel recommended against use of the IPAT Anxiety Scale in measuring preoperative situational anxiety:

> Characteristic anxiety level, as measured by the IPAT Anxiety Scale which was administered to the patients on the evening before their scheduled surgery, did not influence post-operative pain perception. The investigator suggests that this lack of relationship is perhaps related to differences between characteristic and situational anxiety, perhaps the anxiety which seems to influence pain perception is induced by the situation. (Bruegel, 1971, p. 30).

Bursten and Russ (1965) came to the same conclusion as Bruegel (1971) using a similar type of test called the Taylor Manifest Anxiety Scale. They recommended the use of a physiological measure of preoperative situational stress namely, plasma steroid levels. Williams et al (1969) developed an instrument called the Skin Conductance Anxiety Test (SCAT), which they suggest is a valid, reliable and quantitative index of patient anxiety preoperatively. The technique involves the administration of a 2cc./min. infusion of a general anaesthetic (2.5 thiopental sodium) to reduce and galvanize the galvanic skin response (GSR). The quantity of the drug needed to accomplish this purportedly gives a measure of presurgical anxiety. Thus the more drug necessary to eliminate the spontaneous GSR, the higher the level of patient anxiety. Johnson, Dabbs & Leventhal (1970) used a measure of palmar sweat activity as a possible indicator of emotional changes and the resultant changes in autonomic nervous system activity. An index of serum potassium levels was developed by Pride (1968) as a measure of adrenal stress. However, the use of physiological measurements of autonomic nervous system effects cannot be viewed as absolute measurements of preoperative fear and anxiety. Sympathetic stimulation can be triggered by a variety of emotions, not only fear, as well as by changes in physical condition and medications. As previously indicated, physiological measurements are best used in conjunction with patients' self-reports and non-verbal expressions of fear and anxiety. In addition, these types of physiological measurements are not unobtrusive in that it is difficult to keep the patient unaware that they are being carried out. They may also be reactive in that the measurements may be distorted due to a patient's reaction to being studied.

Other researchers have concentrated on developing instruments which are based on patients' self-reports of fear and anxiety. The Zukerman Affect Adjective Check List which gives scores for anxiety, depression and hostility was used by Chapman (1970). The Nowlis (1965) Mood Adjective Check List was modified by J.E. Johnson et al(1970) and used for assessing postoperative state on the operative day through to the fourth postoperative day. A daily score for "negative affect" was obtained by summing the scores of the four negative moods (depression, fear, anger and lethargy) and subtracting the scores for arousal and happiness. This test appeared to be valid in that the direction of the daily change in mood over the hospitalization period was consistent with clinical expectations. Fear was high preoperatively and then gradually decreased. The positive moods of arousal and happiness were low immediately following surgery and then gradually increased. These findings must be considered suggestive since J.E. Johnson et al (1970) did not control for type of surgery or sample sizes, used only females, and did not use random selection or assignment. A Moods and Feelings Inventory was constructed by Wolfer and Davis (1970), who provided a six-point scale of measurement for each mood and feeling described by a total of 20 adjectives. The instrument elicits a separate fear-anxiety "negative affect" score and a "positive affect" score. The inventory was used preoperatively to measure fear and anxiety and postoperatively for two consecutive days. No conclusive data were provided as to the validity or the reliability of

the instrument. However, Wolfer and Davis (1970) reported:

> The most striking feature of these results was the almost complete absence of any significant and substantial (.50 and above) correlation between the pre-and postoperative measures ... The significant correlations were by and large too low to be any value for predicting patients' postoperative recovery from their preoperative emotional states ... The absence of substantial correlations between the pre-and postoperative measures could be attributed to any one or the combination of a large number of factors including the possible unreliability and invalidity of any of the measures or the intervention of uncontrolled variables such as differential quality of medical and nursing care and individual differences in stress-coping ability of the patients. (p. 410-411)

Since the study was uncontrolled for type of surgery, duration of preoperative period or experimental treatment methods, and did not use random selection or assignment, they cautioned that future research "control for situational variables such as specific type of surgery, type and quality of medical and nursing care, both pre-and postoperatively, and patients' coping ability" (Wolfer & Davis, 1970, p. 411).

Johnson et al were also concerned with the relationship of preoperative anxiety to effective postoperative recovery. They reported:

> The results support the hypothesis that emotional behavior appears to be parallel rather than sequentially or causally related to instrumental behavior ... The instrumental behaviors appear to be associated with the belief that one can exert control over what happens ... The emotional drive theory advocates that optimum postoperative adjustment will occur when patients are brought to or maintained at a medium level of preoperative fear. The findings from this study demonstrate that it is not necessary for patients to be frightened and, in fact, the lower the postoperative fear the more likely there will be low negative emotional reactions postoperatively. Also, the findings suggest that emotional reactions do not necessarily interfere with instrumental behaviors (J.E. Johnson et al, 1970, p. 27-28).

Janis (1958) first advocated the emotional drive theory, which postulated that patients with moderate fear preoperatively will be better able to do the "work of worry" and be better prepared for surgery than those with low or high fear. This theory was subsequently not only disproved by J.E. Johnson et al (1970), but also by Wolfer and Davis (1970). The findings of other studies not only disprove the emotional drive theory but underline the conclusion that emotionality is irrelevant to taking action (Leventhal et al, 1966; 1965; 1967). It was found that fear components of the message about lung cancer and tetanus were associated with desires to take protective action, while a combination of fear arousal and specific instructions about how to obtain tetanus innoculations or to reduce smoking were necessary before the protective action occurred. J.E. Johnson et al aptly summarized the findings of research to date:

> When the amount of information on danger exceeds some minimal level, the individual takes protective action as long as he has clear information to guide his behavior. The amount of fear above and beyond some minimal level appears to be irrelevant to taking action (1970, p. 19).

Thus, research has demonstrated that not only is it difficult to measure anxiety preoperatively with any degree of validity, reliability or unobtrusiveness, but the degree of anxiety is largely irrelevant to the taking of action. In practical terms, the only useful finding is that the patients' verbal expressions of fears preoperatively have been shown to be a valid, readily available and unobtrusive indicator of preoperative anxiety (Graham & Conley, 1971).

Closely related to the verbal expressions of fears preoperatively is the method which is used to deal with these fears. Recent research by Johnson (1972) has demonstrated that "cognitive structuring" resulting in accurate expectations about sensations reduces stress.

> In addition, information leading to accurate expectations has proven more effective than the usual nursing practice of describing procedures and the usual explanations given by physicians. Distress was reduced during actual confrontation with the threatening event only when accurate explanations about the sensations experienced were available (Johnson, 1972, p. 502).

Johnson used a laboratory experimental situation in which the threatening event was the application of a blood pressure cuff which was pumped up to 250 mm Hg. pressure and left inflated for a specific period of time. A clinical experimental situation was also used and the threatening event was a gastrointestinal endoscopy, a diagnostic procedure. Johnson's study was based on the psychological theories relevant to the role of cognitive processes in guiding behavior (Chomsky, 1965; Festinger, 1957; Kohlberg, 1969; Miller et al, 1960). Johnson advocated:

> Patients should not be told of sensations that are only rarely experienced because, such information would, for most patients, contribute to incongruency between expected and experienced sensations. On the other hand, if patients are informed of often experienced sensations, incongruency is minimized, (1972, p. 503).

Other studies of preoperative preparation are consistent with that of Johnson (1972) and adovcate that a patient must be informed about his surgical experience (Janis, 1958; Egbert, Battit, Turndorf & Beecher, 1963; Egbert et al, 1964; Norris, 1964; Healy, 1965; Levine & Fiedler, 1970). It is implied that if the patient has a realistic view of the surgical experience he is about to face, he will be less frightened and

anxious and more able to cooperate effectively in his postoperative recovery. Dodge, in a study of medical and surgical patients perceptions of their cognitive needs reported:

> The more a patient knows about his condition, the more likely he is to cooperate successfully in his treatment ... Understanding is facilitated when an individual receives the kind of information that he feels he needs in a particular situation. Conversely, communication is impaired when an individual regards a particular message as not sufficiently important to attend to, or even worse, when he rejects it (1969, p. 502).

Meyer explored the effects of structured communications, no comunication and irrelevant communication in 72 medical and surgical patients. She concluded:

> Less tension is created when the patient is given specific information upon which he can structure the event of impending stress. It is essential to keep in mind that how he has learned to cope with stress from past experience will influence to a large extent the way he handles the stress; but regardless of the fact that he may be overfearful or denying as a result of his personality, communication is important. Since tension is produced by distracting communication, this type of approach is the least desirable and in terms of tension reduction, it would be better to say nothing at all. To tell the patient exactly what is going to happen to him (by structuring the communication) is most desirable (1964, p. 131).

In another study, Schmitt and Woolridge hypothesized that "extra preparation given to experiemental patients would increase their participation in their treatment, decrease stress caused by tension and anxiety, and lead to a more rapid postoperative recovery" (1973, p. 109). There were 50 male patients in the study who were matched for type of surgery and then randomly assigned into experimental or control groups. Experimental patients participated in a group discussion during the evening preoperatively and were provided with four types of information:

1. orientation (e.g. time of surgery or how long they would be in the recovery room;
2. new knowledge;
3. feelings about surgery; and
4. specific activities they could perform to speed up their recovery (e.g. leg exercises).

Control patients received the routine care usually provided by hospital staff which was described as task-oriented. A variety of physiological indicators of postoperative recovery were used as well as patients' self-reports collected in the form of a questionnaire at the time of discharge. Experimental patients demonstrated a more uneventful and rapid recovery than control patients. Schmitt and Wooldridge conclude that "giving the patient initial support and some skills to work with made him better able to cope effectively with the crisis of surgery" (1973, p. 115). The findings must be viewed as suggestive since only men were studied, random selection was not used, the sample sizes were small for each type of surgery (one experimental patient and one control patient) and there were no controls for type of surgery.

As psychological preparation of the patient preoperatively moved closer towards "cognitive structuring" and shaping of a patients expectations, teaching the patient was referred to more frequently. It was either directly stated (Deluca, 1962; Egbert et al, 1964; Hanamey, 1965; Healy, 1968; Weiler, 1968; Mezzanote, 1970; Lindeman & Van Hernam, 1971; Lindeman, 1972) or strongly implied that preoperative instruction improved postoperative recovery. Dumas

(1964) stated that patients need information in order to understand what is happening to them or about to happen to them. If they have understanding, they will be psychologically prepared and have a more uneventful postoperative recovery as measured by incidence of postoperative vomiting. Norris reported that "if on her rounds a nurse can find time to answer her patients questions simply and quietly and explain some of what lies ahead, she will save many a great deal of needless suffering and will have achieved almost as much as the drug premedication - and without any of the side effects associated with the latter" (1964, p. v). Nursing intervention involving information - giving about pain patients are experiencing and how that pain might be relieved in a variety of ways, was described as successful in changing patients' attitudes (Moss & Meyer, 1966). Levine and Fiedler (1970) stressed that fear of the unknown is the greatest fear of the preoperative patient. They described a preoperative information program designed to reduce this fear. A group discussion geared to deal with a wide range of identified cognitive and psychomotor learning needs was provided for experimental patients by Schmitt and Woolridge (1973).

This review of the literature has isolated a number of factors postulated as significant in influencing successful postoperative recovery. Fear and anxiety were believed to be key factors in effective psychological preparation and psychological preoperative preparation has come to be equated with preoperative teaching. However, the emotionality of a patient was demonstrated to be irrelevant to his taking action or being instrumental in his own recovery. Rather, the drawing out of clear expecations, not only about the procedures to be expected, but the

sensations to be expected in a surgical experience, was the major factor in helping a patient to become instrumental in his own recovery. The degree of anxiety manifested preoperatively was not shown to be significant and the only practical, valid and unobtrusive measure of preoperative anxiety was the patients' verbal expressions of his fears. Data relevant to the development of valid and reliable measures of psychological adjustment postoperatively are inconclusive. Physiological measures of patient recovery postoperatively were consistently used to measure the effects of nursing intervention preoperatively whether described as psychological preparation or instruction. No direct measures of patients' learning subsequent to preoperative instruction have been reported. All findings to date are suggestive rather than conclusive in comparative studies of the effects of preoperative preparation or instruction in that no studies controlled for type of surgery.

CORRELATION OF THE EFFECTS OF PREOPERATIVE LEARNING AND POSTOPERATIVE RECOVERY

Learning may be defined as a relatively permanent change in human behavior which cannot be simply described to the pattern of growth (Gagne, 1970, p. 3). Learning as such is an internal process and is similar to anxiety which can be measured only indirectly by measuring the product of learning manifested in cognitive, affective or psychomotor behaviors. The literature has provided a considerable amount of information about a patient's learning needs preoperatively relevant to the three domains of learning - cognitive, affective and psychomotor. Cognitive needs have centered around knowledge to alleviate the fear of the unknown; affective needs have focused on the development of a positive attitude toward impending surgery and a desire to participate in postoperative exercises; psychomotor needs have primarily involved postoperative exercises.

There is little reported evidence pertaining to systematic educational approaches to preoperative learning in which learning objectives were set, relevant learning activities outlined and measurement of learning achievement conducted. There were no directly stated learning objectives reported. Only a few studies even referred to preoperative preparation as education, instruction or teaching (Egbert et al, 1964; Hanamey, 1965; Healy, 1968; Levine & Fiedler, 1970; Mezzanote, 1970; Lindeman & Van Aernam, 1971).

Several studies have outlined learning activities, but none reported testing for learning achieved. Rather, studies to date have tended to use a variety of physiological welfare measures as measures of successful preoperative teaching or learning. These measurements, while they may correlate with effective preoperative instruction and learning, cannot be considered as valid measurements of learning since they do not measure learning directly. In addition, since all previous studies did not control for type of surgery, the validity of the physiological welfare measures as significant correlates of effective preoperative instruction as reported in those studies must be questioned since findings derived in those instances are not comparable.

Therefore it was the purpose of this study to use a randomized experimental design in which type of surgery was controlled and to study the effectiveness of three different types of preoperative learning programs by measuring cognitive achievement, as well as to study the correlation between the effectiveness of the learning programs and postoperative recovery as measured by a variety of physiological measurements. Anxiety was not identified as a single independent variable preoperatively which affects postoperative recovery. Rather, anxiety and fear were considered as the effects of multiple causes involved in the preoperative preparation and postoperative recovery of a patient. Anxiety and fear in the educational model used in this study were treated as preconditions of learning which must be identified and dealt with in setting the stage for preoperative learning.

JUSTIFICATION OF THE PROBLEM

The three types of preoperative learning programs included in this study were:

1. an individualized learning program defined as a planned program designed to meet the specific preoperative learning needs of an individual using a variety of learning activities;

2. a class learning program defined as a planned program designed to meet preoperative learning needs using a group or class method; and

3. an incidental learning program defined as an unplanned program in which patients meet learning needs in an incidental way through the interaction and informal teaching provided by health care personnel involved in their care preoperatively.

Comparison of the effectiveness of different preoperative learning programs is potentially significant to nursing clinicians and nursing researchers as well as to hospital administrators. A study of the effectiveness of a planned preoperative learning program as compared to an unplanned program can be used as a model for clinical practitioners concerned with developing successful preoperative learning programs. Preoperative psychological preparation can be defined as part of a teaching-learning process which reduces anxiety as a precondition for learning, insuring that a patient learns the skills needed to cope effectively with the surgical experience. Once the emphasis in a

preoperative learning program is placed on 1) assessment of the patient's learning needs, 2) provision for control of the preconditions and conditions of learning, 3) the implementation of effective teaching-learning processes and 4) the measurement of a patient's learning, then, a useful body of knowledge about preoperative learning programs can begin to develop. This knowledge is of value not only to the nursing clinician, but also to the nursing researcher concerned with contributing to the growing body of nursing theory.

Hospital administrators should find the study of preoperative learning programs to be of value economically. There are potential cost benefits accruing from the efficient use of staff and facilities if a planned, preoperative learning program is successful in promoting rapid and uneventful postoperative recovery. In addition, operational definitions of expected patient behaviors postoperatively afford a concrete basis for the development of care standards and in accounting for the effectiveness of care provided. The ability to account for services rendered as well as for the economy of those services in a measureable way is of increasing interest to hospital administrators, especially in this era of economic restraint.

DEFINITION OF TERMS

A number of terms which are central to an understanding of this study are defined below:

Adult surgical patient is any patient 15 years of age or older who has been admitted for elective surgery.

Analgesic is any pain-relieving medication ordered by the physician. Analgesics may be administered either orally or parenterally by injection into the tissues.

Beliefs are the recorded verbal reports of a patients' beliefs about his illness, hospitalization, and treatment as determined in the preoperative interview. These beliefs include the facts about these events as the patient believes them to be and also includes fears caused by real dangers and anxieties provoked by unknown and unidentified factors.

Cholecystectomy is the excision of the gallbladder and cystic duct.

Float Nurse is a nurse who is not specifically assigned to a given ward unit but moves as directed from ward to ward during a shift according to the varying ward needs for staff.

Instruction is the process of manipulating the conditions of learning required to allow a person to reach learning objectives.

Learning is a relatively permanent change in human behavior which cannot be simply ascribed to the process of growth.

Length of Postoperative Stay is the number of days the patient is hospitalized postoperatively commencing from the first day following the operation day and including the day of discharge.

Number of Analgesics Administered Preoperatively is the total number of doses of pro re nata (p.r.n. - whenever necessary) oral and parenteral analgesics administered postoperatively.

Postoperative Recovery is the return of a patient to normal function as measured by a variety of physiological indicators including temperature readings, incidence of urinary retention, pulmonary and cardiovascular complications, wound complications, nausea, vomiting and gaseous distension, length of postoperative stay and the numbers of doses of analgesics administered postoperatively.

HYPOTHESES

The following major hypotheses were formulated and tested:

1. That the Individualized Learning Group and the Class Learning Group will demonstrate a more successful postoperative recovery than the Incidental Learning Group as measured by each of the following nine measures:
   - 1.1 fewer doses of oral analgesics;
   - 1.2 fewer doses of parenteral analgesics;
   - 1.3 more rapid progress to the use of oral analgesics;
   - 1.4 fewer days of use of oral analgesics;
   - 1.5 fewer days of use of parenteral analgesics;

1.6 less fever;

1.7 lower incidence of gastrointestinal dysfunction;

1.8 lower incidence of complications; and

1.9 shorter postoperative stay.

2. That the Individualized Learning Group and the Class Learning Group will achieve a higher score on the postoperative cognitive achievement test than the Incidental Learning Group.

The purpose of testing the group differences in terms of physiological indicators was to determine whether or not there is any correlation between these indicators and the effectiveness of different kinds of preoperative learning programs as measured by cognitive achievement scores. In addition, the patients' perceptions of the validity of preoperative learning objectives was assessed through the use of a patient questionnaire administered to all patients on the fifth postoperative day.

ASSUMPTIONS AND DELIMITATIONS

Four major assumptions underlaid the design of this study:

1. The teaching-learning processes involved in each of the three preoperative learning programs were classified as independent variables.

2. Teaching-learning processes were ways of creating learning conditions in which the patient can learn how to cope successfully with the surgical experience.

3. The physiological indicators were measures of postoperative recovery, not learning.

4. The cognitive post-test was a measure of knowledge and was classified as a dependent variable or an effect of the cognitive teaching-learning processes.

Subjects 15 years of age or older and eligible for admission to an adult acute care surgical unit were included in this study. The study was limited to females in that the majority of patients undergoing a cholecystectomy are female, (Sleisenger & Fordtran, 1978, p. 1284). In order to insure that the surgical trauma was relatively equivalent for all patients in the study, subjects admitted for an elective cholecystectomy under non-emergency conditions were selected. A prerequisite skill was the ability to understand oral and written English. Patients who did not have this pre-requisite learning would be unable to reach the learning objectives in the preoperative teaching programs used in the study and therefore were excluded. Patients diagnosed as psychiatric would tend to skew the results of the study since their level of fear and anxiety usually would demand intervention beyond the level of the educational process used in this study, so such patients were excluded.

PLAN OF THE STUDY

The plan of this study included the development of three different preoperative learning programs and testing the effectiveness of those programs by a cognitive post-test on the fifth postoperative day. Correlation of the effectiveness of these three learning programs with a variety of the traditional physiological measures of postoperative recovery was also done as a means of determining whether or not the physiological measures were valid measures of successful preoperative learning as indicated in previous research. In addition, the patients were asked to validate a series of specific preoperative learning objectives involved in a preoperative learning program for a patient undergoing a cholecystectomy. The patients' validation was conducted on the fifth postoperative day and was used as a separate assessment of the three preoperative learning programs.

The rationale underlying the selection of the three learning programs is reported in Chapter II. Chapter III reports the methodology used in the study and findings are presented in Chapter IV. The final chapter contains a summary of the study together with conclusions.

CHAPTER II

DEVELOPMENT OF PREOPERATIVE LEARNING PROGRAMS

The development of the three preoperative learning programs in this study was a critical step. The rationale underlying their selection and development is described in this chapter.

REVIEW OF THE LITERATURE

Published descriptions of preoperative teaching programs have been of limited value in providing for the development of preoperative learning programs. Dumas and Anderson (1964) included a total preoperative preparation in their study, but did not identify this process as educational, although it was strongly implied. Several researchers did some interesting non-experimental studies of preoperative teaching programs (Hanamey, 1965; Levine & Fiedler, 1970; Mezzanote, 1970) In addition to the lack of generalizability of such studies, the learning objectives were not defined in behavioral terms. Teaching techniques were not clearly identified, but consisted mainly of general outlines of what patients were told. Lindeman and Van Aernam (1971), in a controlled study of group and individual teaching methods, used a "stir-up" regimen preoperatively in which deep breathing, coughing, leg exercises and early ambulation techniques were taught. They concluded that group teaching was superior to individual teaching, but this applies only to patients being taught "stir-up" regimens. In addition, the validity of the comparison is questionable since the group method was very individualized. Patients were brought

together in a group setting and stir-up exercises were demonstrated using a slide-sound presentation for the group. However, each patient in the group setting was individually given supervised practice of the exercises and tested for achievement. The individual group of patients viewed the same slide-sound presentation on an individual basis in their rooms and were given supervised practice as well. There was no control of time in the study for the patients experiencing the individual method. The presentation was made available to individual patients sometime during the evening preoperatively, depending on the availability of the projection equipment and staff nurses. The learning conditions for the individual teaching-learning provided in the group setting may well have been more individual and conducive to learning than that provided for individuals in the clinical unit setting where needs of other patients and various clinical demands were in competition. Thus, the difference in learning conditions may be the decisive factor for the observed differences rather than the methods used, which in actuality, both appeared to be individualized. The group discussion technique was used by a variety of researchers (Lindeman, 1972; Lindeman & Van Aernam, 1971; Mezzanote, 1970; Schmidt & Woolridge, 1973), as a means of allowing patients to express their fears and meet some of their cognitive and affective learning needs in a free-flowing style.

This review of the literature was not able to identify a complete plan of a preoperative learning program including learning objectives, teaching-learning strategies, resources required, and testing techniques.

DEVELOPMENT OF THE INDIVIDUALIZED PREOPERATIVE LEARNING PROGRAM

Gagne (1970) maintained that no one teaching approach is consistently superior to another. Rather it is the job of an instructor to identify learning needs, develop behavioral learning objectives based on those needs, provide appropriate conditions for learning and learning activities which maximize learning, and test to determine whether the desired learning was achieved. This rationale was used primarily in the development of the Individualized Preoperative Learning Program.

Development of Learning Objectives

The needs of a learner must be translated into behavioral objectives which describe the expected behavior a learner will demonstrate to show that he has met a given learning need. Learning needs may be categorized into three groups of behaviors (Kibler, 1970): cognitive (knowledge skills), affective (attitudes), and psychomotor (motor skills).

Since learning objectives are the major guideline in the development of an individualized learning plan, the first step in the development of the Individualized Preoperative Learning Program was the definition of objectives. These objectives are listed in TABLE I. These objectives reflect the patient's cognitive, affective and psychomotor learning needs. Previous nursing research indicated that the most effective way of relieving anxiety preoperatively involves interaction between the health professionals and the patient, in which cognitive structure for expectations was provided (Dumas & Anderson, 1964; Egbert et al, 1964; Hanamey, 1965; Janis, 1958; Johnson, 1972; Moss & Meyer, 1966; Schmidt, 1966).

TABLE I

OBJECTIVES OF THE INDIVIDUALIZED PREOPERATIVE LEARNING PROGRAM

At the termination of an individualized preoperative learning program, a patient undergoing an elective cholecystectomy will be able to:

1. identify the roles of major health personnel involved in her care;
2. identify the purposes of the preoperative preparations planned for her;
3. identify how soon she expects to resume normal function of all major body systems postoperatively;
4. identify the sensations she can expect to feel as a result of the major procedures she will undergo preoperatively and postoperatively;
5. demonstrate skill in leg exercises, deep breathing, coughing, turning and ambulating;
6. feel adequate to cope with her surgical experience;
7. accept her role in facilitating her own recovery;
   - 7.1 openly express her needs to the medical and nursing staff;
   - 7.2 perform her own leg exercises, deep breathing, coughing, turning and ambulating exercises with minimal prompting.

Katz, a psychologist, also provided support for this cognitive structuring. He postulated a theory concerning the functions of attitudes and sought to reconcile the irrational versus the rational model of man. He stated that irrational, unthinking responses to attitude cues are more likely in restricted situations where a person has little opportunity to explore or solve problems. Given more communication or involvement in his environment, a person tends to seek meaningfulness or to make sense of stimuli and responds in a rational way (Katz, 1967, pp. 457-458). Thus, preoperative anxiety arising from fear of the unknown is categorized as a cognitive need reflected in cognitive learning objectives, although attitudes may seem to be primarily involved. These cognitive learning objectives are listed in TABLE I:

1. identify the roles of major health personnel involved in her care;
2. identify the purposes of preoperative preparations planned for her;
3. identify how soon she expects to resume normal function of all major body systems postoperatively;
4. identify the sensations she can expect to feel as a result of the major procedures she will undergo preoperatively and postoperatively.

The feeling of helplessness and inadequacy which a patient can experience upon admission to hospital (Dichter, 1954; Lederer, 1958) reflects both an affective (attitudinal) state and an affective learning need. The patient needs to learn not only how to cope with a surgical experience, but must feel able to cope if she is to be motivated

to participate effectively in her own postoperative recovery. Affective learning objectives identified in the Individualized Preoperative Learning Program are:

6. feel adequate to cope with her surgical experience;

7. accept her role in facilitating her own recovery:
   7.1 openly express her needs to the medical and nursing staff; and
   7.2 perform her own leg exercises, deep breathing, coughing turning and ambulating with minimal prompting.

Leg exercises, deep breathing, coughing, turning and ambulating required post-operatively are psychomotor skills. These are relected in a psychomotor learning objective: demonstrate skill in leg exercises, deep breathing, coughing, turning and ambulating (Objective 5). The validity of these psychomotor learning needs was supported in the literature (Dripps & Waters, 1941; Leithauser, 1946; Leithauser, 1949).

Individualized Teaching-Learning Strategies

Methods to provide individualization in educational programming have become more prevalent in the past ten years, (Diamond, 1975; Gagne & Briggs, 1974; Kemp, 1977; Nunney & Hill, 1972; Postlewait et al, 1972), and this research was considered in planning the Individualized Preoperative Learning Program. Individualized learning programs are designed to meet the needs of an individual learner. The strategies may be varied and are selected on the basis of their effectiveness in assisting a given individual to reach the defined learning objectives. The learning program is optimally self-paced and the learner proceeds at his own rate of learning. Complete self-pacing by the learner in the Individualized Learning Program was not possible, but given the time limitation of the

preoperative preparation period, the learning activities were varied and spaced out over the entire period of time to allow a range of individual learning responses (See TABLE II).

The final learning activity scheduled was an interpersonal interaction between the patient and the nurse-researcher in which previous learning was assessed. Based on this feedback, the learner was provided with additional learning experiences designed to insure that she reached the defined learning objectives. The patient had the opportunity to pace this activity and no time limit was set.

The personal interview was used not only to assess learning and to provide additional learning experiences, but also to deal with major preconditions of learning, such as the alleviation of fear and anxiety. Several nursing studies have recommended that the best indicator of fear and anxiety in the preoperative patient was subjective expression (Carnevalli, 1961; Dumas & Anderson, 1964; Graham & Conley, 1971; Parker, 1964; Schmitt & Woolridge, 1973). The patient was encouraged to feel free to express fear and anxiety through the use of non-directive interviewing techniques used in the interpersonal interaction. Although a Nursing History Outline (see Appendix A) was used, the questions were used only to encourage the patient to provide information which she did not do spontaneously in the course of a rambling conversation. For example, the question "What caused you to come to the hospital" may be the only question out of the nine questions relevant to "Perceptions Re Illness" that the nurse-researcher might pose. The patient was encouraged to talk freely at her own rate and to take the lead in the interview.

TABLE II
LEARNING ACTIVITIES IN THE INDIVIDUALIZED PREOPERATIVE LEARNING PROGRAM

OBJECTIVES	LEARNING ACTIVITIES
1. Identify the roles of major health personnel involved in a surgical experience.	(Admission to hospital 3:00 - 4:00 P.M.) Written orientation to roles in pamphlet "You and Your Operation". These roles were reinforced in the sound-and-slide presentation and reviewed and/or reinforced in the preoperative interview.
2. Identify the purposes of the pre-operative preparations planned for her.	Same as for Objective #1
3. Identify how soon she expects to resume normal function of all major body systems postoperatively.	Introduced in a slide-sound presentation entitled "Operation Tomorrow" and expanded upon and reinforced in the preoperative interview.
4. Identify the sensations she can expect to feel as a result of the major procedures she will undergo preoperatively and postoperatively.	Preoperative sensations are outlined primarily in the pamphlet "You and Your Operation". General postoperative expectations are presented in "Operation Tomorrow" and expanded upon and reinforced in the preoperative interview.

TABLE II - Cont'd.

OBJECTIVES	LEARNING ACTIVITIES
5. Demonstrate skill in deep breathing, coughing, turning and ambulating.	Introduced in "Operation Tommorrow" and by the physiotherapist. Assessed in the preoperative interview.
6. Feel adequate to cope with her surgical experience.	Reinforced by all the learning activities and particularly in the preoperative interview.
7. Accept her role in facilitating her own recovery: 7.1 openly express her needs to the medical staff; 7.2 perform her own "stir-up" exercises with minimal prompting.	Same as those outlined for Objective #6.

The patient was not held to the order of questions in the Nursing History Outline but allowed to choose her own order in a natural conversational style. When fear and anxiety were voiced by a patient, the nurse-researcher attempted to reduce it directly through the use of concrete information designed to deal with fears of the unknown surgical experiences.

DEVELOPMENT OF THE CLASS PREOPERATIVE LEARNING PROGRAM

The individual nature of adult learning generally has not been reflected in previous preoperative learning programs reported in the literature. The conventional approach has been to teach people in a group classroom setting, an approach which does not usually allow for individualization. This group method was considered in designing the Class Preoperative Learning Program. It was selected because it is familiar to the majority of adults as a result of their own school experiences. Patients in this study group received formalized instruction as a group in a classroom setting. They viewed the slide-sound presentation "You and Your Operation" which was the same program provided for learners in the Individualized Learning Group. Opportunity to ask questions and to view a live demonstration of leg exercises, deep breathing and coughing were provided. There were no return demonstrations or supervised practise of these psychomotor skills and no testing of learning achieved. The group experience was the primary learning activity in the Class Learning Program.

DEVELOPMENT OF THE INCIDENTAL PREOPERATIVE LEARNING PROGRAM

Formalized, planned preoperative instruction has not been implemented widely in clinical practise. More commonly, preoperative learning occurs in an unplanned, incidental fashion. A patient may or may not be under the care of a nurse or doctor who has both the time and the motivation to provide some preoperative instruction during the course of care. This kind of instruction is not defined or formalized in any way and varies according to the penchant of an individual care giver. This type of learning program was included in this study and designated as the Incidental Learning Program.

ASSESSMENT OF LEARNING

The educational model would not be complete without an assessment of learning. The techniques used for preoperative assessment of learning defined for the patients in the Individualized Learning Group are outlined in TABLE III. There was no planned preoperative assessment of learning achieved by the patients in either the Class or Incidental Learning Groups. Patients in all three learning groups were given a cognitive post-test on the fifth postoperative day to test cognitive achievement. No cognitive pre-test was given.

TABLE III
ASSESSMENT STRATEGIES USED IN THE
INDIVIDUALIZED PREOPERATIVE LEARNING PROGRAM

OBJECTIVES	ASSESSMENT
1. Identify the roles of major health personnel involved in a surgical experience.	Cognitive Questionning
2. Identify the purposes of the preoperative preparations planned for her.	Cognitive Questionning
3. Identify how soon she expects to resume normal function of all major body systems postoperatively.	Cognitive Questionning
4. Identify the sensations she can expect to feel as a result of the major procedures she will undergo preoperatively and postoperatively.	Cognitive Questionning
5. Demonstrate skill in deep breathing, coughing, turning and ambulating.	Cognitive Questionning Return Demonstration
6. Feel adequate to cope with surgical experience.	Interviewing with the Use of the Nursing History Outline
7. Accept her role in facilitating her own recovery:	Not Assessed
7.1 openly express her needs to the medical and nursing staff;	
7.2 perform her own "stir-up" exercises with minimal prompting.	

CHAPTER III

METHODOLOGY

The procedures involved in developing and implementing the study are described in this chapter. They include descriptions of the sampling strategies, implementation of treatment methodologies for each of the three learning groups, control measures, assessment tools and data collection procedures.

SAMPLING PROCEDURES

The potential population included all female preoperative patients who met the stated criteria. The sample was randomly selected from a subset of patients admitted for elective cholecystectomy at a large, metropolitan, acute care hospital during a 20-week period. The potential number of subjects in a 10-week period was 100, which was calculated by reviewing the medical records and the daily Operating Room slates for the previous year.

Random selection of 33 patients for this study was conducted using the confirmed list of admissions to hospital available one week prior to the planned admission date. Three patients were randomly selected weekly from this list.

Attending physicians were contacted after selection of the patients in order to secure medical permission to include the patients in the study. At that time, the physicians were asked for a medical assessment of the subjects selected regarding the existence of any delimiting factors, particularly the ability to understand oral and written English and

psychiatric diagnoses. Random assignment to one of each of the three treatment groups was done following the securing of medical permission and assessment.

The study commenced with the admission of the first participant on Sunday, February 17, 1974. Permission to conduct a study involving the use of live subjects had been granted by the University of British Columbia. Participants were randomly selected and assigned to the three treatment groups during this first week. It quickly became evident that the attrition rate among participants tended to be high, and subsequent participants were randomly assigned from the entire population of females admitted for elective cholecysectomy. The study was conducted over a period of twenty weeks rather than the anticipated eleven weeks. The extended time period was caused primarily by a high attrition rate among subjects, as well as the lack of subjects during one week of the study and illness of the nurse-researcher for another week.

A total of 74 subjects made up the population pool for potential subjects available during this twenty week period. Of these, five were eliminated prior to random assignment, four were eliminated because of psychiatric problems, and one because of a language problem. Of the remaining 64, 31 were eliminated during the course of the study: eight due to the performance of additional surgery other than the cholecystectomy and seventeen due to infractions of the experimental method. Common infractions of the experimental method included failure to receive the pamphlet "You and Your Operation" on admission, failure to attend the sound-and-slide presentation, or attendance at the

sound-and-slide presentation when not stipulated. Six were eliminated due to factors such as language barriers, deafness, or existing illnesses which were not made evident prior to random assignment. More time than expected was given to preoperative interviews, particularly because seventeen of the eliminated subjects were assigned to the Individualized Learning Group and were not eliminated until after the preoperative period.

PREOPERATIVE TREATMENT

The design of the study was a randomized control group post-test design. Three groups of patients were involved. The Individualized Learning Group and the Class Learning Group were designated as the experimental groups and the Incidental Learning Group as the control group.

Individualized Learning Group

The program for the Individualized Learning Group was systematically planned and learning activities and resources were carefully matched to the learning objectives. The scheduled learning activities extended from the time of admission through to the evening of the admission/preoperative day.

Upon admission to hospital in the Admitting Department, a patient in the Individualized Learning Group received a letter of introduction from the nurse-researcher which is shown in TABLE IV. The letter served the following purposes:

TABLE IV
INDIVIDUALIZED LEARNING PROGRAM:
LETTER OF INTRODUCTION

Dear

Welcome to St. Paul's Hospital. The administration and staff at St. Paul's are anxious to help you to recover from your operation as fast as possible. One way of doing this is to teach you how you can help yourself to get better. Because of this, I have been given permission to study how we can put on better teaching programs for patients. I am a graduate student at the University of B.C. and with the permission of the hospital and your doctor I have selected you to help us get some answers. I hope you will agree to take part.

Before you make a decision, I would like you to read the attached pamphlet - "You and Your Operation". This will probably answer some of the questions you might have.

After you have reached your ward and settled in, I have arranged for you to attend a Sound-and-Slide Presentation which is held in the 4 East Clinic Room at 6:30 p.m. this evening. This presentation is put on every evening by the hospital and all patients having an operation are welcome to come. You will find this very helpful in understanding even more about your operation.

I will be up to visit you during the evening to meet you and to answer any more questions you might have. By that time, perhaps you will have made your decision about helping us in this study.

Yours sincerely,

(Ms.) Jean Cranstoun, R.N.,B.ScN.

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1. introduced the nurse-researcher;
2. oriented the patient to the purpose of the study;
3. requested the patient to participate in the study;
4. motivated the patient to be willing to participate in the study;
5. requested the patient to read the pamphlet entitled "You and Your Operation";
6. requested the patient to attend the Sound-and-Slide Presentation entitled "Operation Tomorrow" Scheduled for 6:30 P.M. the evening of admission;
7. informed the patient that the nurse-researcher would be visiting her that evening to answer questions and secure her permission to participate in the study.

The pamphlet "You and Your Operation" was given to the patient on admission (See Appendix A). It described some common and relatively non-threatening aspects of the preoperative preparation process planned for the patient undergoing a cholecystectomy. The patient read this information in the admitting office after admission during the afternoon and while waiting to be taken up to the ward. Thus, it was important that the information be clear, simple and not provocative of a stress response which required feedback or support from nursing staff. The pamphlet introduced the following aspects of preoperative preparation:

1. asking questions is encouraged and expected;
2. outline of the roles of staff involved in her care;
3. self-orientation to ward unit including:
   - 3.1 introduction to roommate(s)
   - 3.2 use of call-bell
   - 3.3 location of bathrooms
   - 3.4 supper time
   - 3.5 time of the afternoon and night shift change
   - 3.6 bedtime
4. rationale underlying procedures involved in physical preoperative preparation;
5. information about dress and transportation to the operating room;
6. sensations expected after receiving the preoperative medication.

At 6:30 p.m. in the evening, the patient viewed the sound-and-slide presentation entitled "You and Your Operation". This presentation was planned (see Appendix B) and developed by the staff of the hospital in which the study was conducted. It was made available to all preoperative patients every evening, except Saturday, at 6:30 p.m. The program was a generalized one designed to meet a variety of group cognitive needs. The topics dealt with in the sound-and-slide presentation included:

1. recognition and descriptions of the roles played by the following staff members:
   - 1.1 registered nurse
   - 1.2 intern
   - 1.3 practical nurse
   - 1.4 housekeeping aide
   - 1.5 orderly
   - 1.6 dietary aide
   - 1.7 physiotherapist
   - 1.8 head nurse
   - 1.9 volunteer
   - 1.10 unit clerk (ward clerk)
   - 1.11 anaethetist

2. rationale underlying procedures involved in physical preoperative preparation:
   - 2.1 skin preparation (shave)
   - 2.2 bath the evening or morning of surgery
   - 2.3 enema
   - 2.4 history
   - 2.5 consent form
   - 2.6 night sedation
   - 2.7 fasting from midnight the night before surgery
   - 2.8 removal of makeup, nail polish and hairpins, eyeglasses, jewelry, dentures, etc. the morning of surgery
   - 2.9 preoperative medication the morning of surgery

3. information about dress and transportation to the operating room;

4. visual orientation to an operating room;

5. orientation to the procedures involved in the post-anethetic room (recovery room);

6. description of three types of anaesthesia and the sensations affected:
   - 6.1 general
   - 6.2 spinal
   - 6.3 local

7. rationale underlying common postoperative treatments or procedures:
   - 7.1 use of the oxygen mask after a general anaesthetic
   - 7.2 frequent checking of blood pressure and pulse
   - 7.3 deep breathing, coughing, leg exercises, turning and ambulating
   - 7.4 self-supporting of incision during coughing
   - 7.5 use of an intravenous infusion
   - 7.6 wound drainage tubes preoperatively

8. diet changes expected as bowel function returns to normal

9. fear of talking under anaesthetic

10. types of wound dressings and drainage

11. control of wound pain

In addition to the sound-and-slide presentation, a demonstration of "stir-up" exercises including deep breathing, coughing and leg exercises was provided by a physiotherapist. Patients were encouraged to practice the "stir-up" exercises as a group, but individual practice was not supervised or learning achievement assessed. A "Float" registered nurse, was assigned to introduce the sound-and-slide presentation and answer any general questions which arose. Individual learning needs relative to preoperative preparation and postoperative recovery of a specific nature were not dealt with at this time.

Following the sound-and-slide presentation, the nurse-researcher visited the patient and secured a written consent to participate in the study. Subsequently, a preoperative interview was carried out to achieve the following purposes:

1. to encourage the patient to verbalize fear and anxiety;
2. to minimize fear and anxiety through concrete explanations of experiences to be expected and how to cope with them as well as other nursing strategies as required to deal with individual fears;
3. to assess learning achieved in relation to observed needs and defined preoperative learning objectives;
4. to provide additional learning experiences required to meet learning needs assessed and the defined cognitive, affective and psychomotor learning objectives.

During the first part of the preoperative interview the nurse-researcher completed a nursing history as a means of getting to know the patient and encouraging her to express her fears and anxieties. The nursing history outline used as a guideline for a non-directive type of interview is included in Appendix C. A relaxed, conversational approach was used to gain information about the patients perceptions of her illness, hospitalization, and treatment, as well as family and home life, and life style. The nursing history was completed in a written form and also included general observations about the patient's appearance, facial expressions, communicativeness and general behavior during the interview. This written nursing history was left on the patient's chart according to established hospital routine.

During the second part of the preoperative interview the nurse-researcher assessed previous learning achieved and provided additional learning experiences as required. Previous cognitive achievement was assessed through the use of questioning and the question guidelines developed for this use are included in Appendix D. The question guidelines were divided into two sections. Part A included questions designed to test learning involved in reading the pamphlet, "You and Your Operation" as well as determining the information which had been provided by the anaesthetist, physiotherapist and ward nurse. Part B of the question guidelines assessed knowledge achieved about the general anaesthetic, preoperative medication, intravenous infusion, anticipated return of normal eating habits and bowel function postoperatively, leg exercises, deep breathing, coughing, turning and ambulation and wound splinting. The patient was also encouraged to voice specific fears about the anaesthetic, intravenous infusion and any other fears causing stress at that time. Skill in performing

leg exercises, deep breathing, coughing turning and ambulating was assessed by asking the patient to demonstrate them.

During the final part of the preoperative interview, the nurse-researcher focused on the more threatening aspects of the postoperative recovery period. It was anticipated that at this stage of the interview a rapport would have been established and the patient would feel more willing to deal with such threatening experiences as wound pain and the gastric tube and suction. The specific postoperative experiences anticipated which were discussed at this stage are listed in TABLE V. Emotional support by a nurse in exploring the implications of postoperative events and how to cope with them was viewed as a critical factor in providing effective conditions for learning preoperatively.

The nurse-researcher was considered the manager of the learning program used for the Individualized Learning Group and was responsible for planning the teaching program and assessing learning. Some instruction was provided directly by the nurse-researcher, but not all instruction required by the Individualized Learning Group was provided directly by the nurse-researcher.

Class Learning Group

This experimental group experienced a preoperative learning program which used a formalized class method. This group viewed the sound-and-slide presentation entitled "Operation To-Morrow" which was previously described. The learning activities included the sound-and-slide presentation, answering of general questions by a nurse, and demonstration of leg exercises, deep breathing and coughing by a physiotherapist.

TABLE V
ORIENTATION TO SPECIFIC ANTICIPATED POSTOPERATIVE EVENTS
IN THE INDIVIDUALIZED LEARNING PROGRAM

1. Simple explanation of the operative procedure and the changes in physiology expected.

2. Type of incision including:
   - 2.1 location
   - 2.2 the possibility of wound drainage tube and the reasons underlying
   - 2.3 type of wound discharge expected
   - 2.4 type of dressings expected
   - 2.5 how often the dressings would be changed
   - 2.6 when the wound drain would be removed and how
   - 2.7 when the stitches would be removed
   - 2.8 how long before total wound healing occurs
   - 2.9 how much wound healing has to occur before discharge home is expected
   - 2.10 implications of ambulation and exercise in relation to wound healing

3. Experiences anticipated in the operating room and the recovery room and underlying rationale:
   - 3.1 type of anaesthetic to be given, how and where
   - 3.2 experiences in the recovery room including frequent monitoring of vital signs and the possible administration of oxygen by mask

4. Immediate postoperative picture and underlying rationale involved:
   - 4.1 gastric tube and gastric suction
   - 4.2 intravenous infusion
   - 4.3 nothing to eat by mouth (NPO)
   - 4.4 type of pain expected, analgesics available, how to secure pain relief and how long severe pain lasts postoperatively
   - 4.5 activity and ambulation expected
   - 4.6 how to turn, deep breathe and cough with minimal pain
   - 4.7 bathing procedures to be expected with an incision

5. Anticipated return of normal function within a tentative time frame:
   - 5.1 eating - progress from nothing by mouth to fluids, soft diet and normal diet
   - 5.2 defecating and relationships to diet, fluid intake and activity
   - 5.3 urinating - how to use a bed pan comfortably and effectively
   - 5.4 sleeping and resting - the possibility of postoperative "blues" and the use of sleeping pills
   - 5.5 ambulation - when to expect and how to move with ease
   - 5.6 anticipated date of discharge home and return to work or normal home and community activity

More specific learning needs related to the patient's cholecystectomy experience were expected to be met by the ward staff and other hospital staff involved in the care of the patient. These specific learning needs were not planned for but were met in an incidental fashion depending on the staff involved. No formal assessment of preoperative learning was planned or carried out during the preoperative period. Incidental assessment of preoperative learning may have occurred but was not reported.

Incidental Learning Group

The Incidental Learning Group experienced an unplanned teaching program in which teaching was carried out on an individual basis, in that it was provided by one health professional at a time to one patient at a time. The health professionals potentially involved in this teaching program included surgeons, anaethetists, nurses and physiotherapists. These health professionals were also potentially involved in the other two treatment groups to the same extent as they were involved with patients in the Incidental Learning Group. Essentially, the needs of patients in this group were not systematically assessed, nor were the teaching-learning activities documented or standardized in any way.

Assignment of Patients to Treatment Groups

One patient per week was randomly assigned to each of the three treatment groups. A standardized written form was used to communicate with the Head Nurse on the ward unit to which a patient was admitted. This form was attached to the patient's chart in Admitting. The Head Nurse was requested to send or not to send a patient to the sound-and-slide presentation as required by the treatment method.

POSTOPERATIVE TREATMENT

Patients in all three treatment groups were tested for cognitive achievement, asked to validate preoperative learning needs of a cholecystectomy patient, and identify personal learning styles on the fifth postoperative day. The treatment ended for all three groups on the fifth postoperative day.

Each patient was requested by the nurse-researcher during the fifth postoperative day to complete a Postoperative Patient Questionnaire. A standardized approach was used to introduce the patients in the Class and Incidental Learning Groups to the nurse-researcher and secure their written consent to participate in the study. An outline of this approach is included in TABLE VI. All patients in each of the three learning groups were given a standardized explanation of how to complete the Postoperative Patient Questionnaire (see TABLE VI).

Assessment of Cognitive Learning Postoperatively

Assessment of cognitive learning postoperatively was measured by a cognitive post-test administered to all patients in each treatment group on the fifth postoperative day. This test was included as part of the Postoperative Patient Questionnaire (see APPENDIX E) to avoid creating any apprehension about testing and thereby biasing the results. Ten multiple choice items were included in this post-test. This instrument was reviewed for content and construct validity by a panel of nurse-educators. Minor changes in wording were made on the suggestions of the judges.

TABLE VI
APPROACH TO PATIENTS RECEIVING THE
POSTOPERATIVE PATIENT QUESTIONNAIRE

Hello, _____, my name is _____. I am a nurse and a student at U.B.C. who is interested in finding out what patients need and want to know about their operation and hospitalization before surgery. I have been given permission by your doctor and the hospital to do this. We would like to have your opinions and I have a questionnaire which we hope you will fill out. Your answers are confidential and are seen only by me. The results of this study can be used by the hospital to plan better care for patients in the future. Would you like to help us in this study and give us permission to include you. (Present consent form)

This questionnaire has 3 parts. The first part, Section A, asks you to mark how important certain people and procedures are to know about. Don't worry over each question, but give us the first impression you get. The second part, Section B, shows what you have learned about your operation. Think out your answers to these questions and take your time with this section. Section C, the third section is a section in which you can write any comments or suggestions you care to make.

Thank you for giving us your time and helping us in this study.

Assessment of Preoperative Learning Needs

Assessment of the validity of the instructional content in all three treatment groups was done by means of a scaled questionnaire included as part of the Postoperative Patient Questionnaire (APPENDIX E) on the fifth postoperative day. A five-point scale was used. This instrument was reviewed by the same panel of nurse-educators used to validate the cognitive post-test. No changes were recommended. There were fifty items in the postoperative learning needs section of the questionnaire. These items reflected the potential cognitive, affective and psychomotor learning needs of a patient undergoing a cholecysectomy. Examples of some of the items are:

			DON'T KNOW
10.	Why you may have an enema before surgery	5 4 3 2 1	____
32.	How much pain you will have	5 4 3 2 1	____
33.	Why you might have a stomach tube after surgery	5 4 3 2 1	____

Assessment of Learning Styles

The third part of the Postoperative Patient Questionnaire dealt with learning style. The patients were asked to identify how they best liked to learn and to give the reasons for their choice. The choices included a private session with a nurse, a group session where feelings could be shared with other patients, a class, a combination of any of the three preceding choices or any other method they chose to name. They were also asked to provide suggestions which would be helpful in planning to provide other patients with information they felt was important.

CONTROLS

Since the ratio of women to men undergoing cholecystectomy is 4:1 (Sleisenger & Fordtran, 1978, p. 1284), possible sex differences were ignored by including only females in the study. All other causes of systematic variance, particularly quality and types of nursing intervention, were controlled by the randomized design. Variance due to doctor intervention was not controlled and this is a weakness in the study.

Biasing of the ward nursing staff by the nurse-researcher could occur in the communication of the summary data of the preoperative interview with patients in the Individualized Learning Group. Since the staff was familiar with nursing students carrying out nursing histories and leaving this data on the chart for staff use as desired, this approach should be accepted as routine by the ward staff and a biased response avoided. In addition, the co-operation of the senior nursing administrators, who were aware of the study, was secured in preventing ward staff awareness of the study, should the ward staff question them about the presence of the nurse-researcher on the ward or the reasons why a patient was or was not being sent to the sound-and-slide presentation.

The confounding effects of time in the preoperative interview were controlled by conducting this activity at the same time for all patients during the evening of the preoperative day. The confounding effects of time and place regarding the presentation of "Operation To-morrow" were controlled in that it was always carried at the same time (6:30 P.M.) and in the same place during the evening of the preoperative day.

The nurse-researcher conducted all of the preoperative interviews in the Individualized Learning Group. Since an interviewer tends to adopt a relatively consistent style, this should prevent this cause of treatment variance. Other variations in treatment for the Individualized Learning Group were controlled by the use of standardized devices and interviewing guides previously described.

The attrition rate was expected to be minimal due to the use of the delimiting criteria for selection of patients and the low mortality rate for cholecystectomy itself which is estimated to be 0.05 per cent (Sleisenger & Fordtran, 1978, p. 1294).

Interaction effects between the nurse-researcher and the treatment subjects, as well as a time biasing factor were potentially involved in the use of the Postoperative Patient Questionnaire. These factors were controlled by giving the questionnaire to all patients on the fifth postoperative day and by using a standardized approach when presenting the questionnaire to each patient. The patient was assured of confidentiality and no signature was required on the questionnaire. Patients were encouraged to assess frankly the usefulness of the instructional content, whether it was given by the nurse-researcher or not. It was stressed that individual comments of patients would not be revealed to anyone but the nurse-researcher.

DATA COLLECTION

Assessment of learning in the Individualized Learning Group was assessed during the preoperative interview. Cognitive learning was tested by the use of a directed question and answer technique, affective learning subjectively by observation of patients verbal reports and nonverbal behavior, and psychomotor learning by the use of patient demonstration. Preoperative learning was also assessed postoperatively by a cognitive post-test given on the fifth postoperative day to patients in all three treatment groups.

Assessment of postoperative recovery was measured by a number of physiological and clinical indicators observed and recorded by the medical and nursing staff. Those data were collected from the medical records as follows:

1. measurements of the physiological variables such as nausea, vomiting, gaseous distension and urinary retention were recorded as either present, signified by 1, or absent, signified by 0;

2. temperature readings above 37°C were considered as fever and recorded to the tenth of a degree Centigrade;

3. unit measurements for analgesics, oral and parenteral were recorded in terms of the numbers of dosages administered and the number of days during which analgesics were administered postoperatively;

No attempt was made to refine these unit measurements of analgesics any further such as Schmitt and Woolridge (1973) have done. It was assumed that a doctor would order an appropriate dosage for each patient according to individual height, weight and other individual criteria. The variance in the quantities administered per dose would tend to be controlled by the randomized design.

4. units of measurement of length of postoperative stay were recorded in days including operative day and day of discharge;

5. measurement of the time postoperatively when a patient commenced use of oral analgesics was recorded in terms of the number of the postoperative day.

Assessment of the 50 preoperative learning needs was scored on a five-point scale which ranged from a score of five, signifying very important, to one, signifying not important at all. "Don't Know" was recorded as zero. These data were collected in the Postoperative Patient Questionnaire on the fifth postoperative day.

Preferences for learning style were indicated on a check list or listed by the patient. These data were also collected as part of the Postoperative Patient Questionnaire on the fifth postoperative day.

STATISTICAL ANALYSIS

The specific hypotheses were tested for significance at the .05 level. One-way analysis of variance of the demographic variables was done to determine a prior equality among the three sample groups. Data

regarding age, marital status, surgical risk classification, anaesthetic time, number of dependents eighteen years of age and under, years of schooling and doctor was tested for intergroup equivalency. The study did not control for doctor intervention as patients were randomly assigned only to treatment groups. Stratified randomization to control for doctor participation was not used, but this factor was considered in the selection of methods of statistical analysis. The hypotheses were tested by analyzing the ten test variables in a nested design with the effects of the three learning groups nested within doctor effects. Factor analysis of the patient questionnaire items was conducted to determine patients' impressions of the significance of the learning objectives in a preoperative learning program.

LIMITATIONS

The major weaknesses of this study exist in evaluation of the instruction itself and the assessment of patient learning. Content validity was assessed by both patients and nurse-educators, but instructional strategies were not assessed for effectiveness of use. Both would provide a more complete assessment of the teaching-learning process, but assessment of the effectiveness of instructional strategies is difficult to implement in unobtrusive ways and was beyond the resources available to implement this study.

The methods of evaluating learning in the Indivdualized Learning Group were complete in relation to the three domains of learning involved. The cognitive and psychomotor assessments used were valid, but the assessment of attitude learning was deficient in that a validated, reliable tool was not used.

The cognitive post-test could be used to give a measure of learning in this study in that it was used in the same way for all subjects. However, the reliability of this tool was not determined prior to the administration of the test and the lack of a pre-test left in question whether the learning measured was an outcome of the preoperative learning program or had occurred prior to admission to hospital.

CHAPTER IV

FINDINGS

The major hypotheses were tested and the findings reported in this chapter. Self-reported learning needs of patients undergoing cholecystectomy and summary data relevant to patients' learning styles were analyzed and reported as well.

CHARACTERISTICS OF THE SAMPLE

Statistics regarding age, years of schooling, status of surgical risk, anaesthetic time, marital status, and number of children eighteen years of age and under are summarized in Table VII. The Class Learning Group had the oldest participants with the highest surgical risk ratings, the longest anaesthetic time and the lowest number of years of schooling. The Individualized Learning Group and the Incidental Learning Group were relatively similar in terms of age, years of schooling and status of surgical risk, but the Individualized Learning Group had a somewhat longer anaesthetic time than the Incidental Learning Group. The Individualized Learning Group and the Incidental learning Group had the same number of married and unmarried participants in a ratio of approximately 3:1. Unmarried participants included all those identified as single, divorced, separated or widowed. The Class Learning Group had an almost even number of married and nonmarried participants. The major difference among the three treatment groups occurred in the Individualized Learning Group which had the largest mean number of children eighteen years of age and under, and the largest number of patients with children. The analysis of the three treatment

TABLE VII
SUMMARY OF CHARACTERISTICS OF THE SAMPLE

VARIABLE	INDIVIDUALIZED LEARNING GROUP	CLASS LEARNING GROUP	INCIDENTAL LEARNING GROUP	OVERALL	F RATIO	CRITICAL VALUE OF F	SIGNIFICANCE
AGE							
Mean	43.455	56.636	46.727	48.939	2.676	3.32	N.S.
S.D.	15.719	10.102	15.206	14.620		(.05)	
YEARS OF SCHOOLING							
Mean	11.545	10.455	11.273	11.091	.509	3.32	N.S.
S.D.	1.9679	3.7246	1.4894	2.5417		(.05)	
STATUS OF SURGICAL RISK							
Mean	1.1818	1.6364	1.2727	1.3636	2.2796	3.32	N.S.
S.D.	0.40452	0.80904	0.46710	0.60302		(.05)	
ANAESTHETIC TIME							
Mean	88.182	102.73	81.818	90.909	2.077	3.32	N.S.
S.D.	25.522	25.919	22.391	25.478		(.05)	
MARITAL STATUS							
Married	72.7%	54.5%	72.7%	66.6%	0.527	3.32	N.S.
Other	27.3%	45.4%	27.3%	33.33%		(.05)	

TABLE VII - Cont'd.

VARIABLE	INDIVIDUALIZED LEARNING GROUP	CLASS LEARNING GROUP	INCIDENTAL LEARNING GROUP	OVERALL	F RATIO	CRITICAL VALUE OF F	SIGNIFICANCE
DEPENDENT CHILDREN 18 AND UNDER							
Mean	1.82	0.36	0.36	0.85	3.38	3.32 (0.05)	Significant
S.D.	2.40	0.81	0.81	2.9			
NUMBER OF PATIENTS WITH DEPENDENT CHILDREN	54.54%	18.18%	27.27%	33.33%		3.3.2 (.05)	

groups demonstrated that there were no significant differences between the groups with the exception of one variable - number of patients with dependent children. In that regard, there was a significant difference among the groups at the 0.05 level attributed to the large number of children under eighteen years of age in the Individualized Learning Group.

CLINICAL SETTING VARIABLES

Eleven doctors were involved in the study and the frequency of their involvement in each treatment group is outlined in Table VIII. The data on doctor involvement in the study was skewed by four doctors who were involved only once; two of these doctors were involved in the Individualized Learning Group and two in the Class Learning Group. Further skewing was caused by Doctor #10 who was involved twice as often the second highest ranking doctor participant. This skewing of doctor involvement may have occurred because of the sample selection strategies. Samples of patients drawn for this study involved almost the entire population of patients available at the hospital under study, rather than randomly selected samples of patients undergoing cholecystectomy. The patients may be considered doctor-selected and as such, the selection could be correlated with the frequency of cholecystectomies performed by the surgeons practising at this hospital. This factor is one which commonly operates in clinical experiemental research and was considered in subsequent analysis of data. This factor might have been controlled by using a stratified random assignment of patients according to doctors.

TABLE VIII
FREQUENCY OF DOCTOR INVOLVEMENT IN THE STUDY

DOCTOR	INDIVIDUALIZED LEARNING GROUP	CLASS LEARNING GROUP	INCIDENTAL LEARNING GROUP	OVERALL	PERCENTAGE OF PATIENTS TREATED BY EACH DOCTOR
1	3	2	0	5	15.2
2	2	0	2	4	12.1
3	0	1	1	2	6.1
4	0	1	0	1	3.0
5	0	1	0	1	3.0
6	1	0	0	1	3.0
7	1	2	0	3	9.1
8	0	2	1	3	9.1
9	1	0	1	2	6.1
10	2	2	6	10	30.3
11	1	0	0	1	3.0
TOTAL NUMBER OF DOCTORS INVOLVED IN EACH OF THE THREE TREATMENT GROUPS	7	7	5	33	100

The problem of controlling for unavoidable extraneous variables which may lead to confounding of a study is a perennial problem in nursing research (B.A. Johnson, 1970; Wolfer, 1973). Unlike previous studies, this study controlled for the type of surgery, but did not control for doctor involvement. Other situational variables which may confound the study include the quality and type of nursing care available to patients which might fluctuate from ward to ward, day to day and shift to shift. Large sample sizes can mediate the confounding effects of such variables. This study used a relatively large sample size, but future research could use even larger samples and control for both doctor involvement and ward unit involvement through stratified random assignment to reduce the confounding effects of these clinical setting variables to a greater degree.

TESTS OF HYPOTHESES

Methods of Analysis

To deal with the skewing caused by doctor involvement in the study, an analysis of group differences nested within doctors was chosen. The University of British Columbia version of the MULTIVAR program was used (University of British Columbia, 1972). The two major elements in this nested design are:

(1) the three experimental groups of thirty-three patients; and

(2) the eleven doctors.

The four doctors who participated only once were combined and analyzed as though they were one doctor (Doctor #8). This nesting of patients within doctors results in seventeen full cells (see Table IX). Observed means

TABLE IX
CELL DISTRIBUTION OF PATIENTS
BY DOCTOR AND TREATMENT GROUP

DOCTOR	1	2	3	4	5	6	7	8	
	CELL n								GROUP N
INDIVIDUALIZED LEARNING GROUP	3	2	-	1	-	1	2	2	11
CLASS LEARNING GROUP	2	-	1	2	2	-	2	2	11
INCIDENTAL LEARNING GROUP	-	2	1	-	1	1	6	-	11
TOTAL NUMBER OF PATIENTS PER DOCTOR	5	4	2	3	3	2	10	4	
DOCTOR	1	2	3	4	5	6	7	8	

of each of the ten test variables were analyzed cell by cell. The treatment group means reported for each test variable were combined estimated means adjusted to accommodate estimated error effects. The significance of the group effects is reported in terms of p values. Since The Incidental Learning Group was considered the control group, differences between the Individualized Learning Group and the Incidental Learning Group, and between the Class Learning and The Incidental Learning Group only, were reported. Doctor-related cell group differences were also analyzed and reported in terms of p values. Since doctor #7 participated in all three treatment groups, he had two p values, showing his relationships to patients in cell groups involving: (1) the Individualized and Incidental Learning Groups; and (2) the Class and Incidental Learning Groups.

The nine postoperative recovery variables used in testing the hypothesis that the Individualized and Class Learning Groups would demonstrate a more successful recovery than the Incidental Learning Group included:

1. doses of oral analgesics;
2. doses of parenteral analgesics;
3. start of the use of oral analgesics;
4. days of oral analgesics;
5. days of parenteral analgesics;
6. incidence of fever;
7. incidence of gastrointestinal dysfunction;
8. incidence of postoperative complications;
9. length of postoperative stay.

Scores on the postoperative cognitive post-test were used in testing the hypothesis that the Individualized and Class Learning Groups would score higher than the Incidental Learning Group.

Treatment Group Differences

All of the nine postoperative recovery variables and the cognitive achievement variable were first analyzed for the significance of treatment group differences. These differences are reported in terms of group p values for the Individualized and Class Learning Groups showing the significance of differences between each of these two treatment groups and the Incidental Learning Group which served as the control group. Observed cell means were reported for each of the seventeen cell groups as well as the combined treatment group means for each of the three treatment groups relevant to each of the ten test variables. These findings are outlined in TABLES X, XI and XII.

The score for gastrointestinal function is an aggregate score compiled by giving each patient one point for each time nausea and vomiting and gaseous distention are reported, each time an antiemetic, laxative or enema is given and for the number of days a nasogastric tube was "in situ". The Incidental Learning Group had the lowest incidence of gastrointestinal dysfunction with a combined group mean of 2.25. The Individualized Learning Group ranked second with a mean of 4.25 and the Class Learning Group third with a mean of 4.40. The p value for the Individualized Learning Group was 0.89 and 0.31 for the Class Learning Group. There were no significant group differences.

TABLE X
TESTS OF SIGNIFICANCE FOR TEST VARIABLES
IN THE INDIVIDUALIZED LEARNING GROUP

INDIVIDUALIZED LEARNING GROUP CELL n	3	2	X	1	X	1	2	2	COMBINED GROUP MEAN	GROUP P VALUE	SIGNIFICANCE
					OBSERVED CELL MEANS						
G.I. Function	3.33	7.0	-	2.0	-	6.0	53.5	5.0	4.25	0.89	N.S.
Fever	3.967	3.85	-	2.7	-	2.1	3.5	4.2	3.43	0.76	N.S.
Complications	0.33	0.5	-	0.0	-	1.0	0.0	1.0	0.497	0.91	N.S.
Doses of Oral Analgesics	10.33	4.5	-	3.0	-	1.0	2.0	2.0	2.57	0.12	N.S.
Does of Parenteral Analgesics	15.0	9.5	-	14.0	-	14.0	10.0	10.0	9.87	0.006	0.006
Start of Oral Analgesics	3.67	3.5	-	3.0	-	4.0	3.0	2.0	2.352	0.13	N.S.
Days of Oral Analgesics	5.33	2.0	-	3.0	-	1.0	1.5	1.5	1.85	0.28	N.S.
Days of Parental Analgesics	4.0	3.5	-	4.0	-	5.0	3.5	5.0	3.77	0.25	N.S.
Postoperative Stay	11.0	11.5	-	7.0	-	8.0	6.5	8.0	8.48	0.89	N.S.
Cognitive Test Score	5.33	4.0	-	6.0	-	7.0	6.5	4.0	5.47	0.83	N.S.

TABLE XI
TESTS OF SIGNIFICANCE FOR TEST VARIABLES
IN THE CLASS LEARNING GROUP

CLASS LEARNING GROUP CELL n	2	X	1	2	2	X	2	2	COMBINED GROUP MEAN	GROUP P VALUE	SIGNIFICANCE
					OBSERVED CELL MEANS						
G.I. Function	10.0	-	5.0	3.0	4.0	-	1.0	4.0	4.40	0.31	N.S.
Fever	3.7	-	3.3	4.3	5.1	-	3.2	3.55	3.95	0.56	N.S.
Complications	0.5	-	1.0	1.5	1.0	-	0.5	1.5	0.96	0.81	N.S.
Doses of Oral Analgesics	5.5	-	6.0	6.5	1.0	-	0.0	6.0	4.79	0.11	N.S.
Doses of Parental Analgesics	12.5	-	12.0	9.5	12.0	-	10.5	14.5	12.07	0.96	N.S.
Start of Oral Analgesics	2.0	-	4.0	3.0	2.0	-	0.0	3.5	2.355	0.52	N.S.
Days of Oral Analgesics	4.0	-	4.0	3.0	1.0	-	0.0	2.5	2.75	0.07	N.S.
Days of Parental Analgesics	4.0	-	6.0	4.0	4.0	-	4.0	4.5	4.33	0.15	N.S.
Postoperative Stay	9.5	-	10.0	8.5	8.5	-	7.5	9.0	8.62	0.47	N.S.
Cognitive Test Score	4.5	-	7.0	5.5	2.5	-	6.0	5.0	5.05	0.60	N.S.

TABLE XII
CELL AND GROUP MEANS FOR TEST VARIABLES
IN THE INCIDENTAL LEARNING GROUP (CONTROL)

INCIDENTAL LEARNING GROUP CELL n	X	2	1	X	1	1	6	X	COMBINED GROUP MEAN
G.I. Function	-	3.0	1.0	-	6.0	0.0	2.5	-	2.25
Fever	-	3.1	2.9	-	3.0	4.3	3.9	-	3.37
Complications	-	1.0	1.0	-	0.0	1.0	0.67	-	0.705
Doses of Oral Analgesics	-	1.5	9.0	-	8.0	7.0	4.0	-	3.596
Doses of Parental Analgesics	-	11.0	14.0	-	20.0	9.0	7.5	-	10.38
Start of Oral Analgesics	-	1.5	4.0	-	4.0	3.0	2.17	-	2.354
Days of Oral Analgesics	-	1.0	4.0	-	3.0	4.0	2.0	-	1.6
Days of Parental Analgesics	-	4.0	4.0	-	4.0	3.0	3.17	-	3.44
Postoperative Stay	-	8.0	9.0	-	7.0	7.0	7.67	-	7.55
Cognitive Test Score	-	3.0	6.0	-	4.0	5.0	5.67	-	4.72

The score for fever is a combined mean of the daily mean temperature readings above 37 degrees Centigrade and was calculated to the tenth of a degree. There was very little difference between group means, although the Incidental Learning Group had the lowest score with a mean of 3.37. The Individualized Learning Group ranked second with a mean of 3.43 and the Class Learning Group third with a mean of 3.95. These group differences are not statistically significant.

Scores for other complications are signified by a 1 if present and a zero if absent. The Individualized Learning Group had the fewest number of complications with a score of six, the Class Learning Group had a score of eleven, and the Incidental Learning Group had a score of eight. The types of complications reported for this test variable and the incidence in each of the three treatments groups is as follows:

Individualized Learning Group (6 Complications):

1. right and left lower lobe pneumonia (1);
2. atelectasis with right pleural effusion (1);
3. muscle spasm in right shoulder (1);
4. skin rash (1);
5. difficulty voiding and catheterized (2);

Class Learning Group (11 Complications):

1. infection as evidenced by fever and treated with antibiotics but unconfirmed as to source (2);
2. difficulty voiding and catheterized (4);
3. wound inflammation with seropurulent discharge (1);
4. urinary tract infection (2);
5. upper respiratory tract infection (1);
6. migraine hedache (1).

Incidental Learning Group (8 Complications):

1. bradycardia (1);
2. hypovolemia (1);
3. fever diagnosed as due to either upper respiratory or urinary tract infection but unconfirmed (1);
4. respiratory infection;
5. anemia (1);
6. difficulty voiding and catheterized (1);
7. segmental atelectasis in the left lower lobe (1);
8. urinary tract infection (1).

The group means were consistent with the incidence of complications. The Individualized Learning Group had a mean of 0.497, the Incidental Learning Group 0.70 and the Class Learning Group 0.96. These differences were not statistically significant.

The Individualized Learning Group had the fewest number of doses of oral analgesics even though three patients in cell one had the highest mean of 10.33 doses. The combined group mean for the Individualized Learning Group was 3.596. The group mean for the Incidental Learning Group was 4.0 and 4.79 for the Class Learning Group. The group differences were not statistically significant, but reflect only suggestive differences with a p value of 0.12 for the Individualized Learning Group and 0.11 for the Class Learning Group.

The Individualized Learning Group had the fewest doses of parenteral analgesics, and a mean of 9.87. The Incidental Learning Group ranked second with a mean of 10.38 and the Class Learning Group was third with a mean of 12.07. There were significant group differences between the Individualized Learning Group and the Incidental Learning Group at the 0.006 level of significance. There were differences approaching significance between the Class Learning Group and the Incidental Learning Group at a p of 0.096.

All three groups had almost identical group means for the number of postoperative days a patient commenced using oral analgesics. The Individualized Learning Group reported a mean of 2.352, the Incidental Learning Group 2.354, and the Class Learning Group 2.355. There were no statistically significant group differences.

The Incidental Learning Group used oral analgesics for the fewest number of days and reported a mean of 1.6 days. The Individualized Learning Group ranked second with a mean of 1.85 days, and the Class Learning Group third with a mean of 2.75 days. There were no statistically significant group differences, although the differences between the Class and Incidental Learning Group at the 0.07 level approached significance.

The Incidental Learning Group also was reported as using parenteral analgesics for the fewest number of days and had a group mean of 3.44 days. The Individualized Learning Group ranked second with a mean of 3.77 days and the Class Learning Group was third with a mean of 4.33 days. There were no significant group differences.

The Incidental Learning Group had the shortest postoperative stay with a mean of 7.55 days. The Individualized Learning Group ranked second with a mean of 8.48 days and the Class Learning Group third with a mean of 8.62 days. There were no significant differences between groups.

There were ten items on the cognitive post-test and the maximum score possible was 10. Patients were given a score of 0 for each wrong answer. The Individualized Learning Group had the highest cognitive achievement score was a mean of 5.47. The Class Learning Group ranked second with a mean of 5.05 and the Incidental Learning Group third with a mean of 4.72. There were no significant group differences.

Although this cognitive post-test had been reviewed by a panel of nurse-educators for content and construct validity prior to its administration, it had not been tested for reliability. After administration of the test, it was analyzed for reliability. The average intercorrelation among the ten items was sufficiently large to justify the total cognitive score as a measure of cognitive achievement. The data reported in Tables IX, X and XI were based on the total cognitive achievement scores for each of the 33 subjects. The alpha reliability of the overall test is 0.63. The findings for the reliability analysis of each of the ten items in the cognitive achievement test are outlined in TABLE XIII.

Doctor-Related Cell Group Differences

Subsequent to testing for treatment group differences, all of the nine postoperative recovery variables and the cognitive achievement variable were analyzed for doctor-related cell group differences. The cell groups of patients treated by each doctor involved in the study were analyzed for significant between-group differences. These findings were reported in terms of p values for each doctor and are listed in TABLE XIV. Since Doctor #7 treated patients in all three treatment groups, he had two p values reported which showed two kinds of between-group cell differences: between the cells in the Individualized Learning Group and the Incidental Learning Group, and between the cells in the Class Learning Group and the Individualized Learning Group. All other doctors had cell groups of patients in only two of the three treatment groups. The p values for all the other doctors, then, showed the other cell group differences between the two treatment groups involved for each doctor as identified at the top of TABLE XIII. There were no significant doctor-related cell group

TABLE XIII
RELIABILITY ANALYSIS: COGNITIVE ACHIEVEMENT TEST

ITEM NUMBER AND STEM	MEAN	S.D.	ALPHA IF ITEM DELETED
1. Leg exercises are important after surgery because they	0.45	0.51	0.60
2. A sleeping pill the night before surgery	0.33	0.49	0.64
3. You are asked to support or "splint" your incision when coughing because	0.73	0.45	0.60
4. In order for the anaethetist to be able to check your circulation during the anaesthetic you are asked to remove your	0.60	0.496	0.59
5. A stomach tube attached to suction may be put in place through your nose because	0.79	0.41	0.63
6. Your intravenous will be stopped	0.58	0.50	0.63
7. You have a drain in your incision because	0.45	0.51	0.62
8. A general anaesthetic is when you are	0.27	0.45	0.61
9. You can expect to go home after your operation	0.51	0.51	0.59
10. After your operation you can expect to eat	0.33	0.48	0.59

Mean Inter-item correlation = .101
Overall alpha = .63

TABLE XIV
TESTS OF SIGNIFICANCE FOR TEST VARIABLES
IN DOCTOR RELATED CELL GROUPS

	CELL n								
Individualized Learning Group	3	2	-	1	-	1	2		2
Class Learning Group	2	-	1	2	2	-		2	2
Incidental Learning Group	-	2	1	-	1	1	6	6	-
Doctor	1	2	3	4	5	6	7	7	8

TEST VARIABLES	DOCTOR P VALUES								
G.I. Function	0.99	0.44	0.99	0.74	0.49	0.44	0.66	0.43	0.56
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Fever	0.92	0.96	0.85	0.54	0.26	0.31	0.66	0.56	0.81
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Complications	0.83	0.77	0.99	0.53	0.74	0.99	0.75	0.94	0.93
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Doses of Oral Analgesics	0.009	0.08	0.23	0.21	0.01	0.52	0.17	0.09	0.21
Significance	0.01	N.S.	N.S.	N.S.	0.01	N.S.	N.S.	N.S.	N.S.
Doses of Prenteral Analgesics	0.001	0.03	0.12	0.002	0.016	0.004	0.001	0.87	0.03
Significance	0.01	0.03	N.S.	0.01	0.02	0.01	0.01	N.S.	0.03
Start of Oral Analgesics	0.05	0.06	0.82	0.18	0.15	0.09	0.06	0.17	0.296
Significance	0.05	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

TABLE XIV - Cont'd.

TEST VARIABLES	DOCTOR P VALUES								
Days of Parenteral Analgesics	0.16	0.46	0.24	0.18	0.26	0.04	0.13	0.76	0.06
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	0.04	N.S.	N.S.	N.S.
Days of Oral Analgesics	0.03	0.22	0.47	0.15	0.03	0.75	0.26	0.06	0.25
Significance	0.03	N.S.	N.S.	N.S.	0.03	N.S.	N.S.	N.S.	N.S.
Postoperative Stay	0.31	0.24	0.88	0.99	0.85	0.79	0.97	0.84	0.88
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Cognitive Test Score	0.91	0.88	0.73	0.89	0.19	0.69	0.84	0.56	0.76
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

differences correlated with gastrointestinal function, fever, complications, postoperative stay or cognitive test scores. However, there were significant doctor-related cell group differences with respect to each of the five analgesic drug variables. The largest number of doctor-related cell group differences were for the numbers of doses of parenteral analgesics. In this instance there were seven significant doctor-related cell group differences reported out of a possible maximum of nine. These cell group differences were significant at a level of 0.01 for four cell groups, 0.02 for one group and 0.03 for 2 groups.

There is some question of validity in classifying these cell group differences as doctor-related. All the analgesics prescribed for the patients in this study were ordered to be administered whenever necessary at the discretion of the nurse. Therefore, the administration of analgesics was nurse controlled. Cell group differences relevant to use of analgesics are more appropriately identified as nurse-related. Cell groups relating to Nurse #1 consistently showed the largest number of significant cell group differences with a total of four cell group differences, at a level of 0.01 in two instances, 0.03 in one and 0.5 in another instance. Nurse #5 ranked second as three significant cell group differences relating to her were reported at levels of 0.01, 0.02 and 0.03. Nurse #6 had two significant cell group differences at levels of 0.01 and 0.04. All of these significant nurse-related cell group differences were correlated with one or more of the five analgesic drug variables. These findings showed that there was a nurse bias factor operating within a number of cell groups correlated with the use of analgesic drugs. The analysis did not demonstrate the significance of the direction of the bias among the three

treatment groups. Only the existence of the nurse bias in relation to nine cell groups was demonstrated. Four of these cell groups involved differences between cell groups from the Individualized and the Class Learning Groups; three were between cell groups from the Class and the Incidental Learning Groups; and two were between cell groups from the Individualized and Incidental Learning Groups. The Class Learning Group was more frequently involved with cell group differences than any of the other learning groups.

CORROBORATION OF TEST VARIABLES

A factor analysis of the ten test variables and the six characteristics of the sample was carried out to determine the relationship among these variables. The findings are reported in TABLE XV. The BMD P4M factor analysis program (University of California, 1977) was used. The principal factors method was involved in the analysis of the correlation matrix of sixteen variables and the six factors elicited were rotated by the varimax method (orthogonal). The factor loadings reported in TABLE XV are sorted, rotated factor loadings. Test variables included:

1. doses of oral anal analgesics;
2. doses of parenteral analgesics;
3. start of the use of oral analgesics;
4. days of oral analgesics;
5. days of parenteral analgesics;
6. incidence of fever;

TABLE XV
FACTOR ANALYSIS: TEST VARIABLES AND CHARACTERISTICS OF THE SAMPLE

VARIABLE	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	h^2
Number of doses of Parenteral Analgesics (T)	0.898*						0.8255
Number of days of Oral Analgesics (T)	0.888*						0.8187
Number of doses of Oral Analgesics (T)	0.802*						0.7312
Age (C)		0.750*				0.411	0.7929
Length of Postoperative Stay (T)	0.460*	0.740*					0.7841
Complications (T)		0.727*					0.593
Status of Surgical Risk (C)		0.578*		0.421*	0.270*		0.6122
Anaesthetic Time (C)			0.733*	-0.346*			0.7731
Start of Use of Oral Analgesics (T)	0.310*		0.704*	0.291*			0.7104
Number of days of Perenteral Analgesics (T)	0.542*		0.632*				0.7431
Cognitive Achievement (T)				0.845*			0.8297

TABLE XV - Cont'd.

VARIABLE	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	h^2
Fever (T)		-0.266*		0.658*	0.454		0.7385
Years of Schooling (C)			-0.257		0.791*		0.7742
Marital Status (C)			-0.324		-0.760*		0.7627
G.I. Function (T)						0.839*	0.7351
Number of Dependent Children (C)	0.481				-0.252*	-0.468	0.5449
VARIANCE	22.72%	15.22%	11.65%	9.12%	8.45%	6.41%	

TOTAL VARIANCE EXPLAINED = 73.55%

T = Test

C = Characteristics of the Sample

* = significant variables

7. incidence of gastrointestinal dysfunction;
8. incidence of postoperative complications;
9. length of postoperative stay;
10. cognitive achievement score.

Characteristics of the sample included:

1. age;
2. years of schooling;
3. status of surgical risk;
4. anaesthetic time;
5. marital status;
6. number of children eighteen years of age and under.

All sixteen variables were included within the six factors which explained 73.55% of the total variance. Not only the ten test variables, but also the six characteristics of the sample were determinants of variance. The ten test variables were corroborated as determinants of variance but were not the only variables in this study which determined variance.

All of the analgesic drug measures clustered in Factor 1 measured similar things and were estimated to be a function of the length of the postoperative stay. This factor was designated as an analgesic drug use factor.

Age, complications and status of surgical risk clustered in Factor 2 and were also estimated to be a function of length of postoperative stay. There was also a negative factor loading for fever in Factor 2. It is characteristic for an elderly person to have a low metabolism and

a tendency towards a low normal body temperature. In addition, the possibility of hypothermia with a consistently low body temperature is being reported more frequently among the elderly. Brocklehurst (1978) described this phenomenon of impaired thermoregulatory reflexes among the elderly. Existing knowledge of gerontology appears to support this negative relationship between low fever and advanced age. Factor 2 was therefore designated as an age-risk factor.

Anaesthetic time, the number of days of use of parenteral analgesics and the start of use of oral analgesics clustered together in Factor 3. There is a logical relationship among these three variables. If a patient had extensive surgical trauma as evidenced by a lengthy anaesthetic time, it is expected that she would have more pain postoperatively and need the use of the more potent parenteral analgesics for a longer time. Consequently, she would also begin the use of the less potent oral analgesics later in the postoperative period. This factor was designated as a surgical trauma factor.

Anaesthetic time, status of surgical risk, fever, start of use of oral analgesics and cognitive achievement score clustered in Factor 4. It would be anticipated that learning and the measurement of cognitive achievement would be affected by the severity of the patient's state of illness. The more severely ill a patient is, the less likely she is to be able to recall preoperative learning and use it to facilitate her own recovery. She would tend to be preoccupied with the distress of her illness and disturbing symptoms such as severe pain, prostration of fever, and the stupor enduced by a long anaesthetic time. The negative factor loading for anaesthetic

time is particularly significant when it is correlated with the positive loading for cognitive achievement. This finding would indicate that a person with a high cognitive achievement score would also have a low anaesthetic time. This is a logical relationship in that a patient with a low anaesthetic time could be expected to be less stuporous postoperatively and perform better on a cognitive achievement test in which cortical functions predominate. This factor was designated as a cognitive achievement factor as related to status of illness.

Many of the variables classified as characteristics of the sample clustered in Factor 5. These included number of dependent children 18 years of age and under, marital status, years of schooling and status of surgical risk. The communality scores and the high factor loadings for years of schooling and marital status strongly suggest that these two variables figure predominately in Factor 5. This factor was designated as a demographic factor.

Interpretation of Factor 6 is based on the high communality score for gastrointestinal function and the fact that it appears only in Factor 6. This factor was designated a gastrointestinal dysfunction factor.

The six characteristics of the sample were corroborated in the factor analysis as determinants of variance as well as the ten test variables. Thus, they were analyzed for treatment group differences and doctor-related cell group differences using the same methods of analysis applied to the test variables. It would also be possible to analyze the six factors elicited in the factor analysis similarly, but this direction was not pursued in this study.

TABLE XVI
TESTS OF SIGNIFICANCE OF THE CHARACTERISTICS OF THE SAMPLE
BY TREATMENT GROUP

INDIVIDUALIZED LEARNING GROUP CELL n	3	2	X	1	X	1	2	2	COMBINED GROUP MEAN	GROUP P VALUE	SIGNIFICANCE
					OBSERVED CELL MEANS						
Age	41.0	71.5	-	27.0	-	32.0	39.0	37.5	41.29	0.84	N.S.
Marital Status	2.0	1.5	-	1.0	-	2.0	2.0	1.5	1.992	0.10	N.S.
Years of Schooling	11.67	10.0	-	13.0	-	13.0	12.0	11.0	10.979	0.84	N.S.
Status of Surgical Risk	1.0	1.5	-	1.0	-	1.0	1.5	1.0	1.08	0.91	N.S.
Anaesthetic Time	98.33	75.0	-	110.0	-	50.0	72.5	110.0	67.87	0.009	N.S.
Number of Dependent Children	2.67	0.0	-	0.0	-	2.0	1.5	1.5	1.38	0.61	N.S.

TABLE XVI - Cont'd.

CLASS LEARNING GROUP CELL n	2	X	1	2	2	X	2	2	COMBINED GROUP MEAN	GROUP P VALUE	SIGNIFICANCE
					OBSERVED CELL MEANS						
Age	50.5	-	74.0	63.5	53.0	-	46.5	61.0	55.09	0.72	N.S.
Marital Status	1.5	-	1.0	1.5	1.0	-	2.0	2.0	1.514	0.66	N.S.
Years of Schooling	8.5	-	11.0	10.5	14.5	-	10.0	8.5	10.34	0.49	N.S.
Status of Surgical Risk	1.0	-	3.0	2.0	1.5	-	1.5	1.5	1.64	0.86	N.S.
Anaesthetic Time	107.5	-	150.0	90.0	107.5	-	77.5	107.5	109.85	0.009	0.01
Number of Dependent Children	1.0	-	0.0	0.0	0.0	-	1.0	0.0	0.45	0.49	N.S.

TABLE XVI - Cont'd.

INCIDENTAL LEARNING GROUP CELL n	X	2	1	X	1	1	6	X	COMBINED GROUP MEAN	GROUP P VALUE	SIGNIFICANCE
					OBSERVED CELL MEANS						
Age	-	57.0	45.0	-	41.0	19.0	49.17	-	47.73		
Marital Status*	-	2.0	2.0	-	1.0	1.0	1.83	-	1.75		
Years of Schooling	-	10.0	8.0	-	12.0	12.0	12.0	-	10.83		
Status of Surgical Risk	-	1.5	1.0	-	1.0	1.0	1.3	-	1.37		
Anaesthetic Time	-	85.0	105.0	-	120.0	70.0	72.5	-	74.71		
Number of Dependent Children	-	0.0	0.0	-	1.0	0.0	0.5	-	0.16		

* 2 = Married
1 = Other (Single, Divorced, Separated, Widowed)

The tests of significance for treatment group differences correlated with the six characteristics of the sample are outlined in TABLE XVI. The only significant finding is in relation to anaesthetic time. The Individualized Learning Group had the lowest mean anaesthetic time at 67.87 minutes. The Incidental Learning Group ranked second with a mean of 74.71 minutes and the Class Learning Group was third with a mean of 109.85 minutes. The differences between the Individualized and Incidental Learning Group, and those between the Class and Incidental Learning Group were both significant at the 0.009 level. Findings of the regression analysis (see TABLE XVII) of both test variables and characteristics of the sample lend support to the significance of anaesthetic time. In that analysis, anaesthetic time was significantly and negatively correlated with the cognitive test score ($r=-.59$) at the 0.02 level. It is not surprising that a low cognitive test score would be related to a high anaesthetic time. Clouding of the sensorium and impaired central nervous system function is known to affect cortical function and cognitive ability.

Further analysis of doctor-related cell group differences was conducted. These findings are listed in TABLE XVIII. There was one significant cell group difference for Doctor 3 related to status of surgical risk at the 0.03 level. The greatest number of significant findings were related to anaesthetic time, which continued to be a significant variable throughout the tests of significance. There were six significant cell group differences at the 0.04 level or lower out of a possible nine. Since anaesthetic time is a doctor-controlled function, these findings demonstrate a doctor-bias factor related to anaesthetic time similar to the

TABLE XVII

REGRESSION ANALYSIS: TEST VARIABLES AND CHARACTERISTICS OF THE SAMPLE

* Significant P Value

CO-VARIABLES	DOSES OF ORAL ANAL.	DOSES OF PARENT ANAL.	START OF ORAL ANAL.	DAYS OF ORAL ANAL.	DAYS OF PARENT ANAL.	LENGTH OF P.O. STAY	G.I. FUNCTION	FEVER	OTHER COMPLI-CATIONS	COGNI-TIVE ACHIEV.
Marital Status										
Reg. Coef.	0.027	-0.260	0.100	0.076	0.009	-0.461	-0.166	-0.0913	-0.142	0.043
P Value	0.92	0.36	0.74	0.79	0.97	0.068	0.58	0.73	0.62	0.85
Age										
Reg. Coef.	-0.299	-0.005	-0.115	-0.298	0.106	0.409	0.313	-0.413	0.260	0.069
P Value	0.36	0.98	0.74	0.53	0.75	0.15	0.37	0.18	0.42	0.79
Surgical Risk										
Reg. Coef.	-0.128	-.140	0.029	-0.111	0.106	0.109	-0.144	0.091	0.015	0.053
P Value	0.65	0.61	0.92	0.71	0.71	0.63	0.6	0.73	0.96	0.82
Anaesthetic Time										
Reg. Coef.	-0.222	0.015	-0.039	-0.046	-0.037	-0.002	-0.038	0.296	-0.004	-0.587
P Value	0.41	0.95	0.89	0.87	0.89	0.99	0.89	0.25	0.99	0.02 *
Yrs. of Schooling										
Reg. Coef.	-0.376	-0.425	-0.011	-0.133	0.324	-0.410	0.107	0.159	-0.187	0.193
P Value	0.19	0.14	0.97	0.66	0.27	0.10	0.72	0.54	0.51	0.41
Dependent Children										
Reg. Coef.	0.215	0.177	0.095	-0.045	0.020	0.224	0.217	0.125	-0.157	-0.198
P Value	0.59	0.57	0.78	0.89	0.95	0.41	0.53	0.68	0.63	0.45

TABLE XVIII
TESTS OF SIGNIFICANCE FOR CHARACTERISTICS OF THE SAMPLE
IN DOCTOR-RELATED CELL GROUPS

	CELL n								
INDIVIDUALIZED GROUP	3	2	-	1	-	1	2		2
CLASS GROUP	2	-	1	2	2	-		2	2
INCIDENTAL GROUP	-	2	1	-	1	1	6	6	-
DOCTOR	1	2	3	4	5	6	7	7	8
CHARACTERISTICS	DOCTOR P VALUES								
Age	0.92	0.31	0.21	0.38	0.85	0.91	0.91	0.81	0.67
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Marital Status	0.30	0.06	0.39	0.07	0.80	0.56	0.12	0.76	0.56
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Years of Schooling	0.72	0.97	0.45	0.76	0.13	0.67	0.94	0.74	0.81
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Status of Surgical Risk	0.84	0.87	0.03	0.49	0.68	0.93	0.84	0.79	0.72
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Anaesthetic Time	0.003	0.03	0.98	0.002	0.04	0.12	0.008	0.18	0.002
Significance	0.01	0.03	N.S.	0.01	0.04	N.S.	0.01	N.S.	0.01
Number of Dependent Children	0.41	0.59	0.64	0.89	0.40	0.63	0.91	0.75	0.69
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

nurse-bias operating in the administration of analgesic drugs, and the existence of this doctor bias was demonstrated in six cell groups. In general the Individualized Learning Group was more frequently involved with cell group differences than any of the other learning groups.

PATIENT PERCEPTION OF PREOPERATIVE LEARNING NEEDS

Each patient in the three treatment groups was asked to complete a patient questionnaire on the fifth postoperative day. There were 50 items representative of learning needs in a preoperative learning program for cholectystectomy patients. The patients were asked to rank each item in terms of how important it was to know about the item before having a cholecystectomy. A patient responded by using a 5-point scale of importance with 5 reflecting "very important", 4, "quite important", 3, "fairly important", 2, "not very important" and 1, "not important at all", or indicating that she didn't know and couldn't respond to the item. The means and standard deviations for each item are listed in TABLE XIX. The patients ranked all 50 items as more than fairly important with the exception of item 18 (What the recovery room looks like) which had a mean score of 2.97.

A description of the fifteen items ranked highest and lowest by the patients is included in TABLES XX AND XXI. Those in the highest category were less dispersed than those in the lowest category. In the highest category, the means ranged from 4.39 to 4.64, and in the lowest category from 2.97 to 3.97.

TABLE XIX
MEANS AND STANDARD DEVIATIONS OF PATIENT RATED
PREOPERATIVE LEARNING NEEDS

QUESTIONNAIRE ITEM	MEAN	STANDARD DEVIATION
1	3.27	1.48
2	4.06	1.14
3	4.48	0.83
4	4.54	0.94
5	4.61	0.79
6	4.36	0.99
7	4.42	0.97
8	4.21	1.29
9	4.51	1.00
10	4.30	1.16
11	4.45	0.97
12	3.97	1.36
13	4.27	1.30
14	4.27	1.04
15	4.27	1.01
16	3.42	1.35
17	3.48	1.35
18	2.97	1.55
19	3.45	1.23
20	4.48	0.91
21	4.48	0.87
22	4.39	0.99
23	4.36	0.93
24	3.97	1.04
25	3.94	1.14
26	3.94	1.34
27	3.73	1.31
28	4.21	1.24
29	3.45	1.44
30	4.21	1.02
31	4.12	1.24
32	4.06	1.09
33	4.42	1.09
34	4.03	1.07
35	4.12	1.23
36	4.64	0.60
37	4.45	0.87
38	4.39	1.25
39	4.48	0.91
40	4.21	0.96

TABLE XIX - Cont'd.

QUESTIONNAIRE ITEM	MEAN	STANDARD DEVIATION
41	4.09	1.07
42	3.54	1.20
43	3.91	1.23
44	4.12	0.99
45	4.18	0.92
46	4.18	1.01
47	4.42	0.97
48	3.82	1.31
49	3.94	0.97
50	4.12	1.14

TABLE XX
HIGHEST RATED PREOPERATIVE LEARNING NEEDS

ITEM NO.	MEAN	DESCRIPTION OF ITEM
Highest Ratings	N=13	
36	4.64	How you do postoperative exercises
5	4.61	How the anaethetist helps you
4	4.54	Why you have a medical history and physical examination before your operation
9	4.51	Why you sign a consent before surgery
3	4.48	What the physiotherapist does for you
20	4.48	Why you are checked so often in the recovery room
21	4.48	Why you might receive oxygen by mask in the recovery room
39	4.48	Why you might have a stomach tube after surgery
11	4.45	Why you can't eat or drink the night before surgery
37	4.45	Why you do postoperative exercises
7	4.42	Why you get a needle the morning of surgery
33	4.42	How your pain is controlled
47	4.42	When you can expect to go back to work or carry on your normal activities
22	4.39	What an intravenous is
38	4.39	Why the nurses keep pestering you to get out of bed and exercise when you don't feel like it

TABLE XXI
LOWEST RATED PREOPERATIVE LEARNING NEEDS

ITEM NO	MEAN	DESCRIPTION OF ITEM
Lowest Ratings	N=15	
18	2.97	What the recovery room looks like
1	3.27	Who the head nurse is
16	3.42	What the operating room looks like
19	3.45	How you are taken to the operating room
29	3.45	What the discharge from your incision looks like
17	3.48	What the Operating Room Nurse Does for You
42	3.54	When you can start eating after your operation
27	3.73	What your dressings will be like
48	3.82	Why you sometimes feel "blue" a few days after your operation
43	3.91	What kinds of food you can eat after surgery
25	3.94	How you feel when you have an intravenous
26	3.94	Where your incision will be
49	3.94	The information given to you in the pamphlet "You and Your Operation"
22	3.97	Why your valuables are locked away
24	3.97	How long you will have an intravenous

Fourteen out of the fifteen highest rated learning needs were cognitive. Only one of the items was psychomotor - how to do postoperative exercises -and it was the highest rated item. The patients demonstrated a keen interest in knowing what experiences they would have preoperatively and postoperatively, the reasons underlying nursing and medical procedures, and how they could participate in their own recovery.

The lowest rated learning needs were all cognitive. Patients didn't especially want to have a physical orientation to the operating and recovery rooms and were not very interested in identifying the Head Nurse or what the Operating Room Nurse did for them. Two of the items related to the preoperative learning period and included the information in the pamphlet "You and Your Operation" and why valuables are locked away preoperatively. However, even though these items are among the fifteen lowest rated, they had means of 3.94 and 3.97 which classifies them as quite important. Six of the other lowest rated items related to knowledge about postoperative experiences and had means ranging from 3.73 to 3.97, which also classifies them as quite important. Two of these items related to knowledge about feelings, including how an intravenous feels and why the "blues" sometimes occur a few days postoperatively.

A factor analysis of the 50 preoperative learning needs was done. Six major factors representative of six sets of learning needs emerged. The BMD P4M factor analysis program (University of California, 1977) was used. The principal factors method was involved in the analysis of the correlation matrix of 50 variables and the six factors elicited were rotated by the varimax method (orthogonal). The factor loadings are listed in

APPENDIX F and are sorted, rotated factor loadings. The factors were designated:

Factor 1: Experiences Expected Immediately Postoperative

Factor 2: Reasons Underlying Procedures Carried Out in the Preoperative Preparation Period

Factor 3: How to Combat the Effects of a General Anaesthetic

Factor 4: Orientation to People and Places

Factor 5: Pain Expected Immediately Postoperative

Factor 6: Landmarks of Recovery in the Late Postoperative Period (Before Going Home)

All of the 50 learning needs were clustered among these six factors with the exception of items 10, 35, 36, 38, 47 and 48. These six factors explained 74.16% of the variance thus indicating that the 45 learning needs involved were significant determinants of variance.

Subsequently, the six preoperative learning need factors were analyzed for treatment group differences and doctor-related cell group differences, using the same methods of analysis applied to the test variables and the characteristics of the sample. The items included within each of the six preoperative learning need factors for the tests of significance are listed in TABLE XXII and the findings of the tests of significance are listed in TABLE XXIII. There were significant treatment group differences. The Individualized Learning Group had a higher group mean than the Class and Incidental Learning Groups for all six preoperative learning need factors.

TABLE XXII
ITEMIZED PREOPERATIVE LEARNING NEEDS FACTORS USED
IN TESTS OF SIGNIFICANCE

FACTOR 1: EXPERIENCES EXPECTED IMMEDIATELY POSTOPERATIVE

31. How strong the stitches are
30. How fast your incision heals
24. How long you will have an intravenous
27. What your dressings will be like
33. How your pain is controlled
34. How long your pain will last
45. When you first get out of bed

FACTOR 2: REASONS UNDERLYING PROCEDURES CARRIED OUT IN THE PREOPERATIVE PREPARATION PERIOD

13. Why you remove your make-up before surgery
8. Why your skin is shaved before surgery
12. Why your valuables are locked away
4. Why you have a medical history and a physical examination before your operation
9. Why you sign a consent before surgery

FACTOR 3: HOW TO COMBAT THE EFFECTS OF A GENERAL ANAESTHETIC

3. What the physiotherapist does for you
5. How the anaethetist helps you
15. How it feels to have a general anaesthetic
37. Why you do postoperative exercises
45. When you first get out of bed
39. Why you might have a stomach tube after surgery

FACTOR 4: ORIENTATION TO PEOPLE AND PLACES

1. Who the head nurse is
18. What the recovery room looks like
2. What the intern or resident does
19. How you are taken to the recovery room

FACTOR 5: PAIN EXPECTED IMMEDIATELY POSTOPERATIVE

32. How much pain you will have
25. How you feel when you have an intravenous
39. Why you might have a stomach tube after surgery

FACTOR 6: LANDMARKS OF RECOVERY IN THE LATE POSTOPERATIVE PERIOD (BEFORE GOING HOME)

46. When you can expect to go home
42. When you start eating after your operation
43. What kinds of food you can eat after surgery

TABLE XXIII
TESTS OF SIGNIFICANCE FOR PREOPERATIVE LEARNING NEEDS BY TREATMENT GROUP

FACTOR	GROUP MEANS				P VALUES	
	INDIVIDUALIZED LEARNING GROUP	CLASS LEARNING GROUP	INCIDENTAL LEARNING GROUP	OVERALL MEAN	A-C *	B-C **
1. Expectations Immediately Postoperative	4.82	3.94	4.11	4.29	0.02	0.04
2. Reasons for Preoperative Preparations	5.26	4.37	3.73	4.46	0.001	0.72
3. How to Combat a General Anaesthetic	5.06	4.36	4.17	4.53	0.004	0.41
4. Orientation to People and Places	3.71	3.50	3.06	3.42	0.12	0.70
5. Pain Expected Immediately Postoperative	5.12	4.23	3.68	4.35	0.007	0.75
6. Landmarks of Recovery	4.05	3.79	3.94	3.93	0.27	0.12

* A-C = Individualized and Incidental Learning Groups
** B-C = Class and Incidental Learning Groups

The differences between the Individualized and Incidental Learning Groups were highly significant at 0.02 or lower for Factors 1, 2, 3 and 5. The Class Learning Group had a higher group mean than the Incidental Learning Group for factors 2, 3, 4 and 5, and a lower mean than the Incidental Learning Group for Factors 1 and 6. The only significant difference between the Class and Incidental Learning Groups was in relation to Factor 1 at the 0.04 level. The Individualized Learning Group had a greater awareness of preoperative learning needs and ranked needs higher than the other learning groups because of this awareness.

Analysis of doctor-related cell group differences showed some significant differences (TABLE XXIV). Significant cell group differences were observed for each of the six factors. The largest numbers of cell group differences occurred in relation to Factors 1, 2 and 3. There were five significant cell group differences for Factor 1 at the 0.03 level or lower, seven for Factor 2 at the 0.01 level or lower, and five for Factor 3 at 0.03 level or lower. It was evident that there was some bias factor operated in order to bring about these cell group differences, but the nature of that bias is difficult to identify. A great variety of doctors and nurses of various categories were involved with instruction of patients about the items involved in the six factors. It is probably accurate to conclude that a doctor-nurse bias was operating in relation to cell group differences correlated with preoperative learning needs.

TABLE XXIV
TESTS OF SIGNIFICANCE FOR PREOPERATIVE LEARNING NEEDS
BY DOCTOR RELATED CELL GROUPS

	CELL								
INDIVIDUALIZED LEARNING GROUP	3	2	-	1	-	1	2		2
CLASS LEARNING GROUP	2	-	1	2	2	-		2	2
INCIDENTAL LEARNING GROUP	-	2	1	-	1	1	6	6	-
DOCTOR	1	2	3	4	5	6	7	7	8
FACTORS	DOCTOR P VALUES								
1. Expectations Immediately Postoperative	0.12	0.03	0.008	0.49	0.01	0.096	0.10	0.007	0.005
Significance	N.S.	0.03	0.008	N.S.	0.01	N.S.	N.S.	0.007	0.005
2. Reasons for Preoperative Preparations	0.01	0.005	0.005	0.29	0.01	0.008	0.01	0.926	0.01
Significance	0.01	0.005	0.005	N.S.	0.01	0.008	0.01	N.S.	0.01
3. How to Combat a General Anaesthetic	0.03	0.12	0.008	0.26	0.08	0.03	0.02	0.63	0.009
Significance	0.03	N.S.	0.008	N.S.	N.S.	0.03	0.02	N.S.	0.009
4. Orientation to People and Places	0.42	0.05	0.08	0.13	0.03	0.25	0.16	0.82	0.31
Significance	N.S.	0.05	N.S.	N.S.	0.03	N.S.	N.S.	N.S.	N.S.
5. Pain Expected Immediately	0.09	0.01	0.299	0.07	0.37	0.16	0.06	0.73	0.02
Significance	N.S.	0.01	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	0.02
6. Landmarks of Recovery	0.63	0.03	0.39	0.86	0.01	0.17	0.31	0.19	0.17
Significance	N.S.	0.03	N.S.	N.S.	0.01	N.S.	N.S.	N.S.	N.S.

PATIENT PREFERENCES FOR LEARNING STYLE

The patients preferences for learning styles were also elicited in the Postoperative Patient Questionnaire. Patients were asked to identify how they liked to Learn: in a private session with their nurse, a group session where they could share their feelings with other patients, a class, a combination of one or more of the preceding strategies or through some other means. The findings are summarized in TABLE XXV.

The three groups of patients tended to show preferences for preoperative learning experiences based on their current learning program experience. The Incidental Learning Group primarily experienced incidental teaching on the part of their nurse and doctor. They showed a strong preference for a private talk with their nurse and indicated that they wanted more information from the doctors. The Class Learning Group showed a strong preference for a group session which corresponded with their preoperative learning experience. The Individualized Learning Group had a variety of learning experiences in their learning program and their responses probably reflect personal cognitive style rather than a tendency to choose learning experiences they were familiar with. They tended to favour a group session and a private talk with the nurse equally, while two

TABLE XXV
PATIENT PREFERENCES FOR LEARNING STYLE

LEARNING STYLE	INDIVIDUALIZED LEARNING GROUP	CLASS LEARNING GROUP	INCIDENTAL LEARNING GROUP
1. A private session with your nurse	3	2	6
2. A group session where you can share your feelings with other patients	4	6	2
3. A class	2	1	1
4. A combination of one or more of the above	2 Slide-and-Sound Presentation and private talk with nurse	2 Slide-and-Sound Presentation and private talk with nurse	2
5. Other	1 Personal explanation from the doctor		4 More informa- from the doctors

patients liked a combination of both. None of the three groups strongly favoured the class approach, including the Class Learning Group which experienced this type of learning situation. Awareness of the kinds of learning opportunities available in a preoperative teaching program appeared to be a major factor in determining preferences for learning style.

The patients were also asked for additional comments which they thought would be helpful in planning to give other patients like themselves, the information that they feel is important. These comments are listed in APPENDIX G and were grouped into five categories:

1. need for knowledge;
2. private talk with nurse;
3. group sessions;
4. individualized learning program;
5. explanations from the doctor;

These comments of the patients were an expression of their direct views of preoperative learning experiences. They document the need for information in order to alleviate fear and anxiety. Perhaps the most cogent comment was made by the patient who stated: "Patients should be informed; ignorance is not bliss".

The hypothesis that patients' views about learning style are influenced by their previous preoperative learning experience was supported by their direct comments about preoperative learning. For example, the Individualized Learning and the Incidental Learning Group experienced a private talk with a nurse preoperatively and tended to make the most favourable comments about this kind of experience. Similarly, the patients who commented on the Individualized Learning Program described the importance of the various learning experiences provided in that program. All the patients who commented about explanations from the doctor were patients in the Incidental Learning Program in which this experience was one of the main learning experiences provided.

DISCUSSION OF TESTS OF HYPOTHESES

The findings provided suggestive evidence only of group differences with the exception of one physiological variable - doses of parenteral analysis. The Individualized Learning Group used fewer doses of parenteral analgesics and was significantly different from the Incidental Learning Group in this regard. The suggestive evidence demonstrates that the major differences occurred between the Individualized and the Incidental Learning Groups. Both the Individualized and Incidental Learning Groups ranked either first or second in relation to all ten test variables. The Class Learning Group ranked third on all ten test variables and in that, was consistently different from the other two groups. Both the Individualized and the Incidental Learning Groups each ranked first on an equal number of the

test variables. The Individualized Learning Group ranked first in relation to complications, doses of oral and parenteral analgesics, the start of oral analgesics and achievement on the cognitive post-tests. The Incidental Learning Group ranked first in relation to gastrointestinal dysfunction, fever, days of oral and parenteral analgesics and postoperative stay. Since it was demonstrated that one doctor tended to skew the data in the Incidental Learning Group, the differences between the Individualized and Incidental Learning Groups may have become more pronounced if doctor involvement had been controlled by the study design. Also, the cognitive post-test may not have been a sufficiently powerful test of learning to distinguish group differences. The use of a series of achievement post-tests both preoperatively and postoperatively would have been better indicators of learning trends. However, the findings suggest that the Individualized Learning Group had the greatest level of achievement and this variable correlated with four of the physiological measurements of postoperative recovery. Three of these postoperative recovery measurements related to measurements of analgesic drug usage, including numbers of doses of parenteral analgesics. Since the factor analysis indicated that all five analgesic drug variables measured the same thing, the three analgesic drug measures, if viewed in aggregate, may be seen as a significant variable in which there were differences between the Individualized Learning Group and the Incidental Learning Group. In conclusion, the findings are of suggestive importance and are indicative of differences between the Individualized and Incidental Learning Groups on measures of learning achievement and postoperative recovery as measured by use of

analgesic drugs. Of all the postoperative recovery measures only the use of analgesic drugs correlated with learning achievement and may be useful as a correlating measure of effective preoperative learning. The validity of these suggestive findings must be tested in future replicated studies.

The usefulness of physiological measures of postoperative recovery as correlating measures of effective preoperative learning was not supported by the findings of this study. With the exception of use of analgesics drugs, which showed suggestive usefulness only, all other postoperative recovery measures were not discriminating measures of group differences resulting from preoperative learning programs. This is contrary to the findings of previous researchers who reported consistent postoperative recovery differences to be highly correlated with preoperative learning. It may be that with the advance of preoperative preparation, including physiological and educational elements, that all preoperative patients are better prepared, whether or not a formalized learning program is provided and that group differences have become too small to be significant. The physiological preparation may also be so advanced that the traditional physiological measures of postoperative recovery are no longer discriminating of the minor differences which occur. For example, gastrointestinal dysfunction and postoperative complications may be occurring so infrequently that the measurements used in this study are not discriminating enough to detect group differences. It may be that with small group differences even more powerful tests of significance than those used in this study are required.

Some of the traditional measures of postoperative recovery need much more investigation as to their validity as postoperative recovery measures before they are used in any future studies as correlating measures of effective preoperative learning. Fever is one of these measures whose validity is questionable. Since an elderly person tends to have a low normal body temperature, even in the presence of infection, a study group which has a sufficient number of elderly people will tend to shift towards the mean, which may well be a normal body temperature. Length of stay factored with both the analgesic drug use measures in one factor and the age-risk variables in another factor. Its validity as a measure of postoperative recovery is also questionable.

Even the direct measurements of effective preoperative learning warrant future investigation of their validity. Cognitive achievement tests must be assessed for validity as a measure of preoperative learning in the context of that situation. In this study, anaesthetic time significantly influenced cognitive achievement scores. In future studies, controls for anaesthetic time would be required to deal with this interaction.

The common finding in clinical experimental research of bias due to the intervention of doctors and nurses was documented in this study, but documentation of the influence of that bias in affecting postoperative recovery was not possible within the limits of this study. All of these findings as to the validity of postoperative recovery and learning achievement measures in discriminating group differences of postoperative recovery point out the need for continuing research for discriminating measures. This study has

contributed somewhat in that direction through the use of the MULTIVAR program of statistical analysis which was effective in eliciting some significant group differences in spite of a skewed doctor participation and treatment groups that did not demonstrate a truly random distribution. Future research must focus on greater controls using stratified random sampling and larger samples if true group differences are to be isolated.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

SUMMARY

The study included the development of three different preoperative learning programs, testing of the effectiveness of these programs by a cognitive post-test on the fifth postoperative day. Correlation of the effectiveness of the three learning programs with a variety of traditional physiological measures of postoperative recovery was also done as a means of determining whether or not the physiological measures were valid correlating measures of successful preoperative learning. This latter point was a significant part of this study in that previous research assumed that the traditional physiological measures were measures of effective preoperative instruction without providing any evidence to support this assumption. Lastly, the study included patient validation of a series of specific preoperative learning needs involved in a preoperative learning program for a patient undergoing cholecystectomy. Summary data relevant to the patients' preferred learning styles were also collected.

Three treatment groups totalling 33 female patients undergoing elective cholecystectomy were randomly assigned. The Individualized Learning Group experienced a preoperative learning program which was based on perception of individual learning needs and included a variety of learning experiences designed to meet those needs, such as printed learning material, a slide-sound presentation, an individual interview/learning session with a nurse. The Class Learning Group experienced a slide-sound presentation which was primarily a class session. Incidental teaching from doctors and

nurses may have supplemented the Class Group experience. The Incidental Learning Group experienced incidental teaching from doctors, nurses and physiotherapists, etc. and was considered the control group.

All patients were asked to respond to a patient questionnaire on the fifth postoperative day, in which they completed a ten-item cognitive test, ranked 50 items representative of preoperative learning needs and identified their preferred learning style. Data relevant to ten test variables (number of doses of oral analgesics, number of doses of parenteral analgesics, number of days of oral analgesics, number of days of parenteral analgesics, postoperative day on which oral analgesics commenced, gastrointestinal function, fever, complications, length of postoperative stay and cognitive test score) and six demographic variables (age, marital status, status of surgical risk, anaesthetic time, number of dependent children 18 years and under and years of schooling) were collected and analyzed for significant treatment group differences and doctor-related cell group differences. The experimental controls were not adequate to control for doctor effects. The doctor influences were taken into consideration by analyzing group differences nested within doctor and the results were data reported as cell group differences. Factor analysis of all ten test variables, six demographic variables and the 50 learning need items was carried out using the principal factors approach and the varimax method of rotation (orthogonal).

There were no significant treatment group differences in relation to the ten dependent test variables, with the exception of number of doses of parenteral analgesics. The Individualized Learning Group use the fewest number of doses of parenteral analgesics and differed significantly from the Incidental Learning Group at a level of 0.006.

However, there are other findings of suggestive importance indicating differences between the Individualized and Incidental Learning Groups on measures of learning achievement and postoperative recovery as measured by the use of analgesic drugs. Of all of the postoperative recovery measures, only the use of analgesic drugs correlated suggestively with learning achievement and may be useful as a correlating measure of effective preoperative learning. The validity of these suggestive findings must be tested in future replicated studies.

Significant nurse-related cell group differences were noted in relation to all of the five analgesic drug measures, particularly, number of doses of parenteral drugs. Significant doctor-related cell group differences were noted in relation to anaesthetic time and anaesthetic time correlated significantly and negatively at the 0.02 level with the cognitive test score. Thus patients with a long anaesthetic time were likely to have a low cognitive test score and vice versa. There were also significant treatment group differences between the Individualized, Class and Incidental Learning Groups in relation to anaesthetic time at the 0.009 level.

Patients from all three treatment groups rated the 50 preoperative learning needs as more than fairly important, with the exception of one item. Patients in the Individualized Learning Group had a greater awareness of learning needs and rated learning needs higher than the other treatment groups. Highly significant treatment group differences at the 0.02 level or lower were reported for the Individualized Learning Group in relation to four of the six groups of learning needs elicited through factor analysis.

Patients demonstrated a keen interest in knowing what experiences they would have preoperatively and postoperatively, the reasons underlying nursing and medical procedures and how they could participate in their own recovery. Forty-five of the fifty learning needs were included among the six factors elicited in the factor analysis and these factors explained 74.16% of the variance. Thus, not only did patients perceive preoperative learning needs as important, but the significance of those learning needs as determinants of variance was supported by the factor analysis.

Analysis of preoperative learning needs for doctor-related cell group differences showed significant differences for each of the six factors. The largest numbers of cell group differences occurred in relation to Factors 1, 2 and 3 namely: experiences expected immediately postoperative, reasons underlying preoperative preparation procedures and how to combat a general anaesthetic. It was estimated that a doctor-nurse bias was operating in relation to cell group differences associated with preoperative learning needs.

Patient preferences for learning styles tended to reflect their current experience in a treatment group rather than personal cognitive style, with the exception of the Individualized Learning Group. The Individualized Learning Group experienced a wide variety of learning experiences and thus were more likely to choose learning style which best matched their own cognitive style, rather than only that style which had been provided in their preoperative learning program.

CONCLUSIONS

The hypotheses that the Individualized and the Class Learning Groups would demonstrate a more successful postoperative recovery than the Incidental Learning Group based on measurements of the nine test variables were rejected for eight of the variables and accepted for one:

> The Individualized Learning Group used fewer doses of parenteral analgesics than the Incidental Learning Group (or control group).

The hypothesis that the Individualized and the Class Learning Groups would score higher on the postoperative cognitive achievement test than the Incidental Learning Group was rejected.

The usefulness of physiological measures of postoperative recovery as correlating measures of effective preoperative learning was not supported by the findings of this study. With the exception of the use of analgesic drugs, which showed suggestive usefulness only, all other postoperative recovery measures were not discriminating measures of group differences resulting from preoperative learning programs. This is contrary to the findings of previous researchers who reported consistent preoperative recovery differences to be highly correlated with preoperative learning.

Patients validated 49 out of the 50 preoperative learning needs of a cholecystectomy patient. Data from the factor analysis of preoperative learning needs supported the patients views.

IMPLICATIONS

Despite the difficulties of a truly randomized experimental design, continuing experimental research relevant to the effectiveness of preoperative learning programs is warranted. There has been ample research documenting and validating patients' learning needs preoperatively and validating learning needs based on patient perceptions. The major emphasis in future research should be on the development and implementation of preoperative learning programs designed to meet validated needs in various ways and including a variety of learning experiences designed to appeal to a variety of individual cognitive learning styles. Comparison of the effectiveness of learning programs including pre-hospital admission experiences with traditional post-admission learning experiences are warranted as well as investigation of the cognitive learning styles (Nunney & Hill, 1972) of patients in preoperative learning programs. The need for the development of definitive preoperative learning programs is becoming even more crucial with the advance of quality assurance programs such as the Wisconsin System (Hover & Zimmer, 1978) in which four of the five critical criteria are related to learning programs:

Criterion I Knowledge of illness and its treatment

Criterion II Skills

Criterion III Knowledge of medications

Criterion IV Adaptive behaviors

Criterion V Health and physiological status

Cost analysis of different types of preoperative learning programs is also of importance in future research. Prescrott and Sorensen state:

> As the costs of health care continue to increase at an alarming rate, health care funders are concerned that programs be both effective in achieving desired results and efficient in using resources to obtain those results. Program evaluators can no longer simply limit their studies to program outcomes. Now evaluation must relate program outcomes to program costs. This type of analysis, called cost-outcome and cost-effectiveness analysis, answers evaluation questions such as "What resources were consumed to produce the results of Program A?' or 'Is program A more effective relative to resources consumed than Program B'?" (1978, p. 17).

The cost-effectiveness of different learning experiences should include an assessment of the cost-effectiveness of the activities of a variety of health care personnel who may be involved in a preoperative learning program, such a surgeons, anaesthetists, family doctors, doctors' office nurses, ward unit staff, operating room nurses, physiotherapists and dieticians, as well as specialized patient teaching staff.

In conclusion, previous research in preoperative learning programs has focused primarily on identifying patient learning needs based on patient perception. In the future, research emphasis should be placed on generalizable experimental research, concerned with patients' cognitive learning styles, teaching-learning strategies, use of a wide variety of health personnel in teaching roles and valid evaluation of learning outcomes within a cost-effectiveness framework.

This study served to point out the usefulness of specific directions for future research, primarily research geared to provide the clinical practitioners who are involved in preoperative learning programs with effective tools for effecting preoperative learning and measuring the outcomes of learning against specific behaviorial learning criteria. This study provided a model of a planned preoperative learning program which can be used by practicioners in carrying out preoperative instruction. Lastly, the study confirmed that there is no validity in continuing to use physiological measures of postoperative recovery as correlating measures of effective preoperative learning until further research has been carried out to validate these measures.

BIBLIOGRAPHY

American College of Surgeons, Committee on Pre- and Postoperative Care; Manual of Preoperative and Postoperative Care, 2nd ed., Philadelphia: W. B. Saunders Co., 1971.

Aydelotte, Myrtle M., "The Use of Patient Welfare As a Criterion Measure", Nursing Research, Vol. II, No. 1, Winter, 1962, pp. 10-14.

_____ BMD P4M - Factor Analysis, Los Angelos, California: Health Science and Computing Facility, University of California, 1977.

Brocklehurst, J.C. (ed.), Textbook of geriatric Medicine and Gerontology, 2nd ed., London: Churchill Livinstone, 1978.

Brodt, Dagmar E. and Anderson, Ellen H. "Validation of a Patient Welfare Evaluation Instrument", Nursing Research, Vol. 16, No. 2, Spring, 1967, pp. 167-169.

Bruegel, Mary A. "Relationship of Preoperative Anxiety to Perception of Postoperative Pain", Nursing Research, Vol. 20, No. 1, January-February, 1971, pp. 26-30.

Bursten, Ben and Russ, J.J., "Preoperative psychological state and corticosteroid levels of surgical patients," Psychsomatic Medicine, 27:309-316, July-August, 1965.

Carnivalli, Doris, A Study to Compare Patients and Nurses Perceptions of Anxiety-Producing Factors and Supportive Aspects of Nursing Care in the Preoperative period, Seattle, Wash.: University of Washington, 1961 (Unpublished master's thesis).

Chapman, J.E., "Effects of different nursing approaches on psychological and physiological responses", Nursing Research Report 5:1ff, March, 1970.

Chomsky, Noam, Aspects of Theory of Syntax, Cambridge, Mass: M.I.T. Press, 1965.

DeCecco, John P. and Crawford, Wm. R., The Psychology of Learning and Instruction, 2nd ed., Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1974.

De Luca, Virginia M., Some Observations on the Use of a Deliberative Nursing Process and the Incidence of Urinary Retention Following Surgery,
New Haven, Conn.: Yale University School of Nursing, 1962. (M.S. thesis microfilm) (Abstracted in Nursing Research, Vol. 13, No. 275, Summer, 1964, p. 139.

Diamond, Robert M. et al Instructional Development for Individualized Learning in Higher Education,
Englewood Cliffs, New Jersey: Educational Technology Publications, 1975.

Dichter, Ernest, "A psychological study of the hospital patient relationship; what the patient really wants from the hospital." Modern Hospital, Vol. 83, No. 136, September 1954, pp. 51-54.

Dodge, Joan S., "Factors Related to Patients' Perceptions of their Cognitive Needs," Nursing Research, Vol. 18, No. 6, November - December, 1969, pp. 502-513.

Dripps, R.D. and Waters, R.N., "Nursing Care of Surgical Patients: Part 1. The Stir-up", American Journal of Nursing, Vol. 4, May, 1941, pp. 530-534.

Dumas, Rhetaugh G. and Leonard, Robert C., "The Effect of Nursing on the Incidence of Postoperative Vomiting", Nursing Research, Vol. 12, Winter, 1963, pp. 12-15.

Dumas, Rhetaugh G. and Anderson, Barbara J., "Psychological Preparation Beneficial If Based on Individual's Needs, Hospital Topics, Vol. 42, May, 1964, p. 79.

Eckenoff, J.E., "Some preoperative warning of potential operating-room deaths", New England Journal of Medicine, Vol. 255, December 6, 1956, pp. 1075-1079.

Egbert, Lawrence D., Battit, George E., Turndorf, Herman and Beecher, Henry K., "The Value of the preoperative Visit by an Anaethetist," Journal of the American Medical Association, Vol. 185, No. 7, August 17, 1963, pp. 553-555.

Egbert, Lawrence D., Battit, George E., Turndorf, Herman and Beecher, Henry K. "Reduction of Postoperative Pain by Encouragement and Instruction of Patients", New England Journal of Medicine, Vol. 270, April 16, 1964, pp. 825-827.

Elman, Robert, Surgical Care: A Practical Physiological Guide,
New York: Appleton-Century Crofts, 1951, pp. 42-46.

Festinger, Leon, Theory of Cognitive Dissonance,
Evanston, Illinois: Row, Peterson, 1957.

Gagne, Robert M., The Conditions of Learning, 2nd ed.,
New York: Holt, Rinehart and Winston, Inc., 1970.

Gagne, Robert M. and Briggs, Leslie J., Principles of Instructional Design,
Toronto: Holt, Rinehart and Winston, Inc., 1974.

Giller, D.W., Some pyschological correlates of recovery from surgery
Tex Rep Biology Med., Vol. 20, Fall, 1962, p. 366-376.

Graham, Lois E. and Conley, Elizabeth M., "Evaluation of Anxiety and Fear in Adult Surgical Patients," Nursing Research, Vol. 20, March-April, 1971, pp. 113-122.

Hanamey, Rosemary, "Teaching Patients Breathing and Coughing Techniques, Nursing Outlook, August, 1965, pp. 58-59.

Healy, Kathryn M., "Does Preoperative Instruction Make a Difference?" American Journal of Nursing, Vol. 68, January, 1968, p. 62-67.

Houle, Cyril O., The Design of Education,
San Francisco: Jossey-Bass, Inc., Publishers, 1972.

Hover, Julie and Zimmer, Marie J., "Nursing Quality Assurance: The Wisconsin System," Nursing Outlook, April, 1978, pp. 242-248.

Janis, I.L., Psychological Stress: Psychoanalytic and Behavioral Studies of Surgical Patients,
New York: John Wiley and Sons, 1958.

Johnson, B.A. et al, "Research in nursing practice, the problems of uncontrolled situational variables," Nursing Research, Vol. 19, July-August, 1970, pp. 337-340.

Johnson, Jean E., "Effects of Structuring Patients' Expectation of Their Reactions to Threatening Events," Nursing Research, Vol. 2, November-December, 1972, pp. 499-504.

Johnson, Jean E., Dabbs, James M. and Levanthal, Howard, "Psychological Factors in the Welfare of Surgical Patients'", Nursing Research, Vol. 19, No. 1, January-February, 1970, pp. 18-29.

Katz, Daniel, "The Functional Approach to the Study of Attitudes", in Martin Fishbein (ed.) Readings in Attitude Theory and Measurement, New York: John Wiley and Sons, Inc., 1967, pp. 457-458.

Kemp, Jerrold, E., Instructional Design, 2nd ed.,
Belmond, California: Fearon Publishers, Inc., 1977.

Kibler, Robert J. et al, Behavioral Objectives and Instruction,
Boston: Allyn and Bacon, Inc., 1970.

Kohlberg, L., "Stage and sequence: the cognitive-developmental approach to socialization" in D. A. Goslin (ed.) Handbook of Socialization Theory and Research, Chicago: Rand McNally and Co., 1969, pp. 347-480.

Lederer, Henry, "How patients view their world," in E.C. Jaco, (ed.), Patients, Physicians and Illness, Glencoe, Ill: Free Press, 1958, p. 249.

Leithauser, D.J., Early Ambulation and Related Procedures in Surgical Management, Springfield, Ill.: Charles C. Thomas, 1946, p. 175.

Levanthal, Howard et al, "Sex difference in attitude and behavior change under conditions of fear and specific instructions," Exp. Soc. Psychol; Vol. 2(4), 1966, pp. 381-399.

Levanthal, Howard, "Effects of fear and instructions on how to cope with danger," J. Personality Soc. Psych., Vol. 6, July, 1967, pp. 313-321.

Levine, Dale C. and Fiedler, June P., "Fear, Facts and Fantasies About Pre- and Postoperative Care," Nursing Outlook, Vol. 70, February, 1970, pp. 26-27.

Lindeman, Carol A. and Van Aernam, Betty, "Nursing Intervention with the Presurgical Patient - The Effects of Structured and Unstructured Preoperative Teaching," Nursing Research, Vol. 20, July-August, 1971, pp. 319-332.

Lindeman, Carol A., "Nursing Intervention with the Presurgical Patient," Nursing Research, Vol. 21, May-June 1972, pp. 196-209.

Mager, Robert F., Preparing Instructional Objectives, Palo Alto, California: Fearon Publishers, 1962.

May, Rollo, The Meaning of Anxiety, New York: The Ronald Press Co., 1950.

Meyers, Mary E., "The Effect of Types of Communication on Patients' Reaction to Stress", Nursing Research, Vol. 13, No. 2, Spring, 1964, pp. 126-131.

Mezzanote, Elizabeth J., "Group Instruction in Preparation for Surgery", American Journal of Nursing, Vol. 70, January 1970, pp. 89-91.

Miller, G.A. et al, Plans and the Structure of Behavior, New York: Rinehart & Winston, 1960.

Miller, Patricia, A Descriptive Survey to Identify and Compare the Concerns of Preoperative Patients, Seattle, Wash.: University of Washington, 1965 (unpublished master's thesis).

Moss, Fay T. and Meyer, Burton, "The Effects of Nursing Interaction Upon Pain Relief in Patients," Nursing Research, Vol. 15, Fall, 1966, pp. 303-306.

Norris, Walter, "Pre-anaesthetic Medication", Nursing Mirror, Vol. 18, September, 1964, p. iii-v.

Nowlis, V., "Research with the mood adjective checklist," in S. Tomskin & E. Izard (eds.) Affect, Cognition and Personality, New York: Spring, 1965, pp. 352-389.

Nunney, Derek N., and Hill, Joseph E., "Personalized Educational Programs," Audiovisual Instruction, February, 1972, pp. 10-15.

Palmer, Irene S., "The Development of a Measuring Device," Nursing Research, Vol. 14, No. 2, Spring, 1965, pp. 100-105.

Parker, Dorothy, A Study to Compare Patients' and Nurses' Perception of Anxiety-Producing Factors and Supportive Aspects of Nursing Care in the Preoperative Period, and of Nursing which was Perceived as Being Supportive, Seattle, Wash.: University of Washington, 1964 (unpublished master's thesis).

Popham, W. James and Baker, Eva L., Planning Instructional Sequence, Englewood Cliffs, New Jersey: Prentice-Hall, Ince., 1970.

Postlethwait, Samuel N., Novak, J. and Murray, H., The Audio-Tutorial Approach to Learning, Minneapolis: Burgess Publishing Co., 1972.

Prescott, P.A. and Sorensen, James E., "Cost-effectiveness Analysis: An Approach to Evaluating Nursing Programs," Nursing Administration Quarterly, Vol. 4, No. 4, 1978, pp. 17-40.

Pride, L.F., "An Adrenal stress index as a criterion measure for nursing," Nursing Research, Vol. 17, July-August, 1968, pp. 292-303.

Ramsay, M.A.F., "A Survey of Preoperative Fear", Anaesthesia, Vol. 27, October, 1972, pp. 396-402.

Saylor, Dennis E., "Understanding Presurgical Anxiety," AORN Journal, Vol. 22, No. 4, October, 1975, pp. 624-636.

Schmidt, Ruth L., An Exploratory Study of Nursing and Patient Readiness for Survery, New Haven, Conn: Yale University, School of Nursing, 1966 (unpublished master's thesis).

Schmidt, Florence E. and Woolridge, Powhatan J., "Psychological Preparation of Surgical Patients", Nursing Research, Vol. 73, March-April, 1973, pp. 108-116.

Selye, Hans Stress: The Physiology and Pathology of Exposure to Stress, Montreal: Acta, Inc., 1950.

Simon, J.R., "Nurses' Ratings of Patient Welfare as Criterion Measures in the Health Sciences," Occup. Psych., Vol. 35 (1-2), 1961, pp. 10-22.

Sleisenger, Marvin H. and Fordtran, John S., Gastrointestinal Disease, 2nd ed., Toronto: W.B. Saunders, 1978, p. 1284.

Snelbecker, Glenn E., Learning Theory, Instructional Theory and Psychoeducational Design, Toronto: McGraw-Hill Book Co., 1974.

Tanasuk, M.B., et al, "An experimental test of the importance of communication skills for effective nursing" in J.K. Skipper, Jr. & R.C. Leonard, (eds.) Social Interaction and Patient Care, Philadelphia: J.B. Lippincott Co., 1965, pp. 110-120.

Titchener, James L. and Levine, Maurice, Surgery As a Human Experience, New York: Oxford University Press, 1960, p. 52.

_____ University of British Columbia version of MULTIVAR (Multivariant Analysis and Co-variance, 6.1, International Educational Services), 1972.

Wallis, Ruth M., "Preoperative visits - A Challenge for OR Nurses", AORN Journal, December, 1971, pp. 53-56.

Weiler Sister M. Cashel, "Postoperative Patients Evaluate Instruction", American Journal of Nursing, July, 1968, pp. 1465-1467.

Williams, James, Jones, John R., and Williams, Barbara, A physiological measure of preoperative anxiety Psychosomatic Medicine, Vol. XXXI, 1969, pp. 522-527.

Wolfer, John A. and Davis, Carol E., "Assessment of Surgical Patients' Preoperative Emotional Condition and Postoperative Welfare", Nursing Research, Vol. 19, September-October, 1970, pp. 402-414.

Wolfer, John A., "Definition and Assessment of Surgical Patients' Welfare and Recovery", (Selected Review of the Literature), Nursing Research, Vol. 22, September-October, 1973, pp. 394-401.

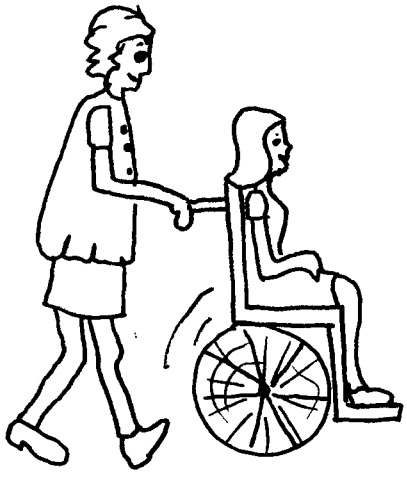
APPENDIX A

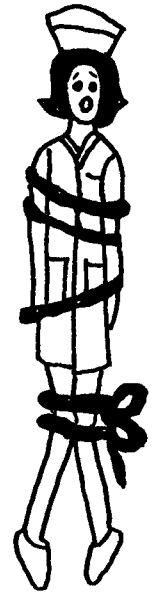
PAMPHLET: "YOU AND YOUR OPERATION"

'YOU AND YOUR OPERATION'

ARRIVING AT HOSPITAL

You probably felt sort of strange and lonely as you sat waiting for the Admitting Clerk to take your information. Everybody seems to be so busy and rushing about. You feel that you shouldn't really bother them to ask that nagging little question you have. STOP! The first lesson for a new patient to learn is that people usually have a minute to spare. If you have a problem or a question, tell somebody about it. If they can't help you they will tell you who can. Remember nobody can guess what you are thinking so ask away. We really want to know how we can help you even if we look tied-up.





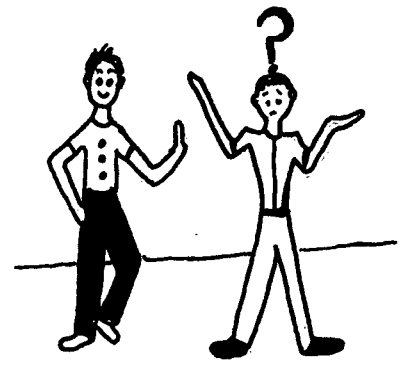
ON THE WARD

From the Admitting Office you will be taken up to your ward, probably by a Volunteer (a member of the Women's Auxillary) who will be wearing a red smock. Ask her where your ward is and what your room number is. You will want this information to give your family and friends.

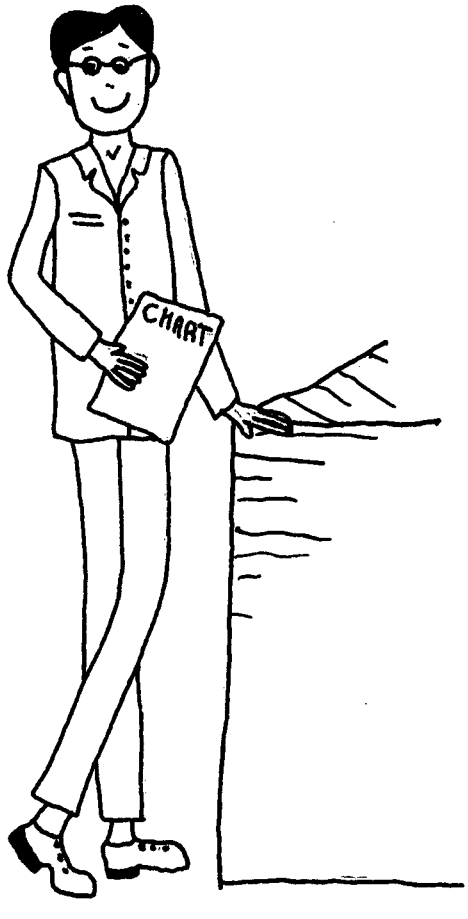
On the ward, you will be greeted by the Ward Clerk, who is like a sort of secretary for the Ward. She works under the direction of the Head Nurse. She takes most of the telephone messages and is a good person to know if you have a message to be delivered. She is at the Nurses' Station most of the time so she catches the nurses and doctors as they come and go.

Don't be upset if the nurses seem quite frantic when you arrive. The change of shift is 3.30 p.m. so the day nurses are rushing to finish and, then the afternoon nurses are rushing to get organized. Things will settle down by supper-time and your nurse will have a little more time. Supper comes between 5:00 and 6:00 p.m.

In the meantime, take a look around your room, meet your room-mates, find out how your call-bell works, look for bathrooms and generally get feeling a little more familiar with your new home. Also, remember Rule No. 1 - ASK QUESTIONS. Your room-mate probably has lots of answers if she has been in hospital a few days.



SPECIAL HAPPENINGS! SPECIAL VISITORS!
ON THE EVENING BEFORE YOUR OPERATION



You are a very busy person this evening and you will be having a number of special visitors. Each one of them will be helping you to prepare for your operation in a special way.

THE SURGICAL RESIDENT OR INTERN

This person is what is known as a "house doctor" in the movies. He is a graduate of a medical school and is learning special skills in the hospital under the direction of your doctor and other surgeons. He will be visiting you and will be asking you questions about your medical history as well as doing a physical examination. This is requested by your doctor just to be sure that you are in tip-top shape for surgery. He will also order some routine blood and urine tests to be done.

THE ANAESTHETIST

Your anaesthetist is a specialist in giving anaesthetics of all kinds. He is also concerned about preparing you for your surgery. He will usually ask you a few questions and perhaps, listen to your chest. You will be having a "general anaesthetic" which means you will be completely asleep for your operation. Your anaesthetist is a good person to ask questions. He can tell you when your operation is, how long it will be and how long you will be in the Recovery Room (where you go to wake up before coming back to the Ward). If you have any concerns about your anaesthetic or sleeping ask your anaesthetist.

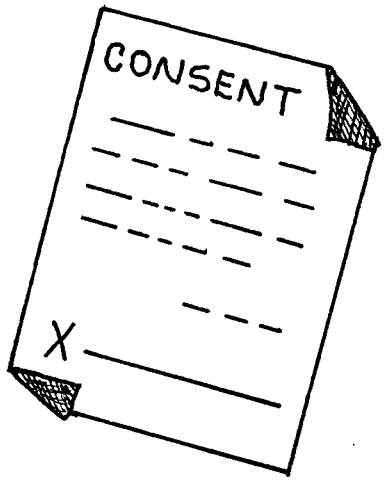
Usually your anaesthetist orders some medications for you before the operation.

THE FIRST MEDICATION is a sleeping pill which you may have if you prefer and you do not have to take if you have any objection. This medication is quite mild and certainly not addictive when taken under these circumstances. Many patients find it a help to settle to sleep when they are bothered by the strange bed, the noise at night or the worry you feel before an operation.

THE NEXT MEDICATION he has ordered for you will be given to you one hour before your operation in the morning. This medication, sometimes called the preoperative medication or "preop. med." by the nurses, is quite strong and is given by needle. You will start to feel very drowsy in about 15 minutes and your tongue might feel dry. Be sure that you have passed your water just before this and are ready to settle down to sleep before it's time to go to the operating room.

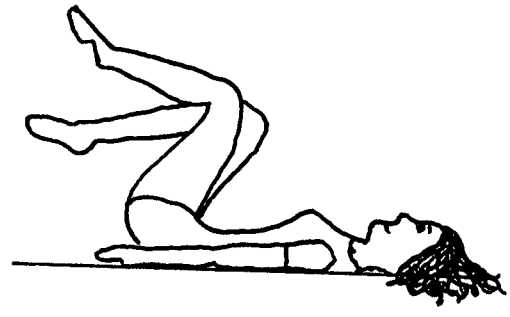
THE PHYSIOTHERAPIST

This lady is concerned about helping you get better faster. She will explain the "stir-up" exercises and help you to learn how to do them. You will be getting another chance to practice after the "Operation Tomorrow" presentation this evening. We all know how important these exercises are for you to learn. How well you do your exercises after the operation has a lot to do with how fast you get better. Your physiotherapist will be visiting you after your operation to see how you get along and help you to do your exercises.



THE "PREP NURSE"

This nurse will be giving you what is known as a preoperative skin preparation and called a "prep" by the nurses and a shave by you. It is routine to shave a wide space all around the area where your incision will be and to clean the skin with a special disinfecting soap. Hair can't be disinfected so it is removed by shaving. We don't want you to have any infection after your operation.



YOUR NURSE

Your nurse will be popping in and out during the evening, but she has some special things to do in helping you to prepare:

THE CONSENT FORM

Your nurse will be asking you to sign a consent-for-surgery form. This is a standard practice in hospitals to make sure that a person knows he is having an operation and what kind. This also gives your doctor permission to do your surgery.

THE ENEMA

Your doctor will order an enema for you if he thinks it is necessary. In an operation like yours, your bowel is quite slow afterwards. If you haven't had an enema before the operation you can get quite constipated and that is no fun when you have an abdominal incision.

AT BEDTIME

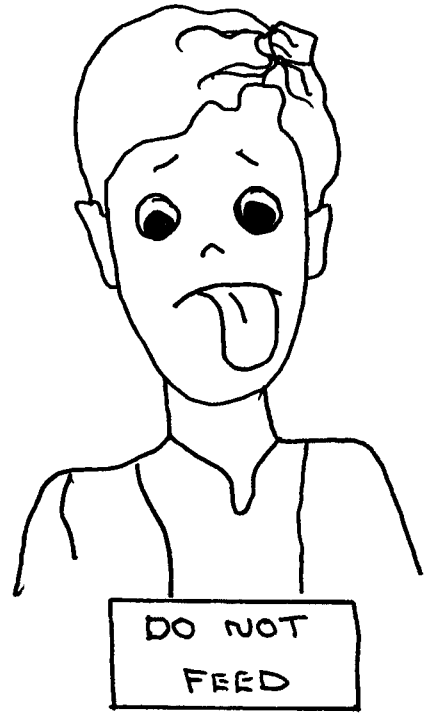
Your nurse will be coming around with the sleeping pills about 10:00 p.m. If you want to stay up and read or watch T.V. let her know. The shift changes at 11:30 p.m. and she could ask the night nurse to give you a sleeping pill if you prefer.

After midnight your food and water supply is cut off. We aren't trying to be mean. This is a very important precaution before a general anaesthetic. Please do not eat or drink ANYTHING after midnight. If you do this can be a serious danger during the operation, and the anaesthetic will have to be delayed or cancelled depending on what you ate. Your water jug will be removed and a FASTING sign will be put on your bed to remind you and the nurses.

THE BATH

Your nurse will encourage you to have a bath at bedtime with a special hospital soap. This is also part of the preparation of your skin to prevent infection. Ask her where the tubs or showers are and tell her which you prefer.

Remember that your nurses are with you 24 hours of every day and the reason they are is to be able to help. Let them know what your problems are and what kind of help you need.



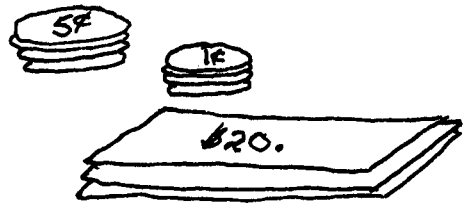
THE MORNING OF YOUR OPERATION

When you first wake up in the morning don't forget to leave a sample of urine for the nurse when you go to the bathroom. A routine test of your urine is expected by your doctor.

Your nurse will be reminding you about other special preparations which are done for your safety:

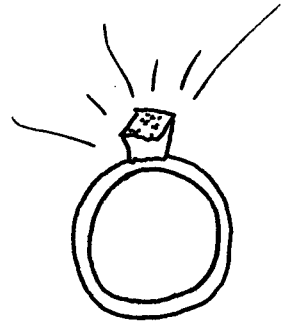
VALUABLES?

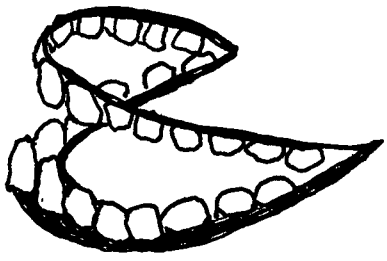
All personal valuables such as watches, rings and money are listed and locked away while you are in the operating room. You can ask to have them back as soon as you return.



MAKE-UP?

All make-up and nail polish is removed so that the anaesthetist can look at the colour of your skin and nails during the operation.





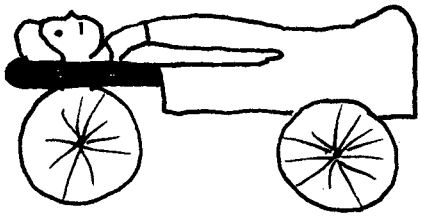
REMOVABLES?

Other removable objects such as hairpins, glasses, contact lenses, dentures, wigs, hearing aids, pierced earrings, etc., should be removed and stored away. We ask you to do this because loose objects can injure you when you are asleep as well as being lost or broken.

YOUR NEEDLE

Remember to pass your water just before your needle is due and settle into bed to wait for your nurse.

GOING TO THE O.R.



Finally the big moment arrives. A nurse from the O.R. will come to take you to the operating room on a stretcher. She will cover your hair with a little cap and will take you up to the operating room on the 6th Floor. There, she will introduce you to the nurse who will stay with you during your operation.

Don't forget your date with "Operation Tomorrow" at 6:30 p.m.!

APPENDIX B

SCRIPT OF SOUND-AND-SLIDE PRESENTATION: "OPERATION TO-MORROW"

OPERATION TOMORROW

1. Welcome to St. Paul's Hospital. I am here to help make you familiar with the events which will occur before and after your operation. I will try to answer any questions you have, so remember them and ask me after the slides are over.

2. First, let me introduce you to some of the members of the health team that will be looking after you. It takes many different people with different skills to totally look after any one patient. It is sometimes difficult to identify who you are talking to by his or her uniform, but he will usually have a name tag on, or you can simply ask him.

   In the back row on the far left is a

   1. Registered Nurse, standing holding a tray of medicines, she may be assigned to give you care or to supervise those giving your care.

   2. Standing beside the nurse with a white jacket on and a stethoscope around his neck, is an interne. Residents and Internes are doctors who are gaining experience by working in the hospital under the supervision of more senior doctors.

   3. Next to the Interne is the Practical Nurse who in this picture has a green cross on her cap. She gives nursing care under the supervision of a Registered Nurse.

   4. Next is a member of the housekeeping staff wearing a gold uniform. Members of this department are responsible for keeping the hospital clean.

5. The Orderly is on the far right holding a treatment tray. He is trained to assist nurses in caring for male patients and is identifiable by the blue trim on his collar.

6. In the front row on the far left is a lady wearing a pink dress and holding a meal tray. She is one of the members of the dietary department and you will see them on your ward.

7. The girl sitting in the middle wearing a blue shirt and white blouse is a physiotherapist. Later she will be teaching you the exercises you must do after your operation and will be helping you do them on the ward.

8. The Head Nurse, seated on the right holding a chart, is an experienced Registered Nurse who is responsible for all the nursing care given on her ward.

3. On admission to hospital you gave the Admitting Clerk information. The Admitting procedure may or may not have included the taking of blood sample from your arm.

4. You were then taken to the ward. If the lady had a red smock on, she was a volunteer member of the Women's Auxilliary and this is one of their services. On the ward you were greeted by a Unit Clerk or by a nurse.

5. The evening before your surgery you will receive what we call

6. Pre-operative Preparation or "Preop-Prep".

7. For most of you a skin shave is required. As skin hair is a possible source of infection, it is removed. Your incision will not be as large as the area shaved.

8. It is a good idea to take a tub bath or shower (if possible) the night before or the morning of your surgery with special hospital soap.

9. An enema or cleansing of the bowel is necessary for abdominal surgery and some other types of surgery as well. The enema prevents you from having a bowel movement immediately after surgery. The nurse on your ward will inform you if you are to have an enema.

10. The Anaesthetist is a doctor with special training in putting patients to sleep or making a certain area numb. He may visit you or just review your chart to obtain the information he requires. If he visits he will ask you questions and please feel free to ask him questions.

    There are three types of anaesthesia:

    a) With a general anesthetic you go completely to sleep in a few seconds. This anesthetic is injected by a needle into your arm.

    b) With a spinal anesthetic you have no censation from the waist downwards.

    c) With a local anesthetic only a specific area has no sensation.

    The choice of anesthesia is made by your doctor and your anesthetist.

11. As this is a teaching hospital, an interne may take your history on behalf of your surgeon. It is necessary that you cooperate and answer his or her questions.

12. You will sign a surgery consent form. This grants the doctor permission to perform the surgery and also indicates that you have had the surgery explained to you. If you do not sign this form the surgery cannot be done.

13. As everyone is a bit nervous before surgery, the doctor ensures you a good night's sleep by giving you a sleeping medication.

14. After 12 midnight tonight you will not be allowed to eat or drink anything because your stomach must be empty to ensure your safety. Even your water jug is taken away so please do not take a drink from the tap in the bathroom, or eat anything. This is a request on behalf of your anesthetist. If your sugery is very late or you are having a local anesthetic, special instructions regarding food will be made.

15. The morning of surgery.
    On the morning of surgery special preparations may be necessary depending on the type of surgery to be done. I cannot tell you what these will be as each surgery differs. Your ward nurse will explain what has to be done.

16. A urine sample will be taken your first morning in hospital. When you wake up and want to go to the bathroom, please use your bedpan or urinal and set it aside for the nurse.

17. A special note:

Ladies - we request that you remove all traces of makeup and nail polish before going to the Operating Room. It is essential that the Anesthetist be able to observe the colour of your lips and nails. Do not apply makeup of any kind in the morning. If your hair is long it should be braided and all hair pins, etc. be removed. Your hair will be covered during surgery.

Men - it is advisable that you shave in the morning.

To all of you - remove your false eyelashes, eye glasses, contact lenses, wigs, hair pieces, hearing aids, pierced earrings and all other jewellry. For denture wearers a special cup is provided for your teeth and left at the bedside until your return to the ward.

Wearing apparel to the Operating Room is a hospital gown only. Please do not wear underwear.

The time of your surgery may be moved up or delayed according to the Operating Room scheduling. Sometimes a surgery takes more time and sometimes less time, then scheduled. Don't be surprised if your surgery is earlier or later than you had expected.

18. About an hour before your surgery time you will receive a "preop-medication". This may be a pill or an injection. The medication will make you drowsy and relaxed. Do not be alarmed if your mouth gets very dry. This is an effect some drugs have. Please stay in bed after you have had this medication.

19. The next person you will notice is from the Operating Room. This person will transfer you to a stretcher and put a cover over your hair to keep it out of the way and from getting tangled. Then you will be taken up to the 6th floor where the Operating Room is located.

20. What the elevator looks like from the stretcher.

21. In the Operating Room you will be greeted by a nurse who will remain with you during your surgery.

22. A scene in the Operating Room theater, where nurses and doctors are preparing for surgery.

23. In this picture the nurses are moving a patient from the stretcher to the Operating Room table.

24. After the surgery is completed you will go by stretcher to the Post Anesthetic Room. If you have a had a local anesthetic you will probably be returned directly to your room.

    In the Post Anesthetic Room there are many patients who, like you, are waking up from the anaesthetic. Many nurses are in attendance and will be watching you carefully. They frequently take your blood pressure, pulse and observe the colour of your face to ensure all is well. They will frequently ask you your name. This is not because they don't know you, but because they want to see how awake you are. The bed bars that are up in this picture are there for your safety.

At this time I'd like to dispel two common fears:

1. Talking under anesthetic. Patients rarely say anything when they are waking up, much less something that can be understood.

2. In the Post Anesthetic Room you may fear the person next to you is too close. You are close, however, the nurses are very careful to protect your modesty.

25. If you have had a general anesthetic, you may wake up with an oxygen mask over your mouth and nose. Do not be alarmed, oxygen is given to everyone who has had a general anesthetic. The nurses and doctors are skilled in judging when it is time for you to return to your ward. Your stay in Post Anesthetic Room may vary from 1 hour to several hours or sometimes overnight. Your relatives and visitors will not be able to visit you in the Post Anesthetic Room.

26. This is how you return to your ward.

27. The ward nurses will check your blood pressure and pulse several times.

28. They will also check your dressings or your cast. If you have a dressing, it may be big or small depending on your doctor and your surgery. The dressing may feel tight until you get used to it. Certain surgeries have no dressings. These incisions are sealed with a special spray. Some surgeries may require tubes to keep your stomach empty or to prevent fluid from collecting under your skin and causing swelling and discomfort. Do not be alarmed at the color of the drainage - it may be red, brown or greenish but is perfectly normal.

29. Soon after you wake up from the anesthetic or get the feeling back in your legs (depending upon what type of anesthetic you have had) the nurses will start your 'stir-up program'.

    This includes:

    - deep breathing and coughing
    - leg exercises - push both knees down hard on the bed, then relax, also moving your legs up and down in bed
    - turning from side to side in bed.

30. The deep breathing and coughing is done to help your lungs keep expanded and bring up any bits of phlegm which may be sitting in them. The nurse will show you how to support your incision when you cough so that it doesn't cause pain.

    The leg exercises and turning are done to stimulate blood flow to every part of your body. The blod tends to flow slowly when you must lie in 1 position in bed. In order to have a speedy and complete recovery you must actively participate in this stir-up program.

31. In some cases the physiotherapist will teach you the best way to breathe, cough and do exercises before your surgery and also see you after surgery.

32. After a surgical procedure you can expect discomfort, or an ache, or a pain. The nurses cannot remove every bit of discomfort as so much medication would put you in sleep. Then you would not breathe as deeply or be able to do the 'stir-up' program. I said you can expect to feel uncomfortable. However, pain killing medication will be given frequently and you can also ask for it. As the days go by the medication will be needed less frequently.

33. Following your surgery you may notice an intravenous going into your arm. This is necessary because you are not eating and/or some medications are given intravenously. The duration of the intravenous will depend upon your doctor's order.

    Eating of food after surgery will be restricted according to what surgery you have had. Somethimes the anesthetic will affect the stomach and make the bowel sluggish. Therefore your food is restricted. When everything is working properly you will be passing gas or the nurse when listening to your abdomen will hear "rumbling sounds."

34. Usually abdominal types of surgery are first limited to intravenous fluids and then to fluids by mouth. Gradually the food is changed to a soft diet and then to a full regular diet.

35. Following chest and abdominal types of surgery you will sleep a lot. Rest is important in the healing process. Sleep when you can but when awake remember to do the 'stir-up' program of moving your legs, deep breating and coughing.

36. On orders from your doctor, probably the first or second day after your operation you will be assisted to sit on the edge of the bed for a few minutes several times a day. Then you may start walking short distances. It is important to get up and about as soon as possible because it helps your blood to circulate and prevents your muscles from getting stiff and sore. Activity also helps you feel better.

APPENDIX C

NURSING HISTORY OUTLINE

PREOPERATIVE INTERVIEW GUIDE

General Observations:

1. General appearance
2. Facial expression
3. Behavior during interview
4. Communicativeness

Perceptions Re Illness:

5. What caused you to come to the hospital?
6. How long have you had your problem?
7. What do you think caused your illness?
8. When did you first go to the doctor?
9. How long have you been going to your family doctor?
10. Did you see a specialist as well?
11. What has bothered you most about your illness?
12. Have you been on any medications or special diets at home?
13. Do you have any other medical problems which might restrict your activity in hospital?

Perceptions Re Hospitalization and Treatment:

14. Have you been in hospital before?
15. When? For what reasons?
16. What do you miss most in hospital?
17. What is the nicest thing that happened to you in hospital?
18. What has your doctor told you about your illness?
19. Your operation?
20. When do you expect to be able to go home?

21. To go back to school, work, etc.?
22. What kinds of things make you feel better when you are sick?
23. What kinds of problems do you think someone who is going to have an operation like yours will have?
24. How do you think a person feels before an operation like yours?

Family and Home Life:

25. With whom do you live?
26. Do you have a family? Where do they live?
27. Children?
28. Will they be coming to visit you in hospital?
29. Do you want any restrictions on your visitors?
30. Where will you be going following hospitalization?
31. Who will be able to help you when you go home?
32. Will you have trouble getting around at home?
33. Are the bedrooms, bathrooms, kitchen convenient?
34. Do you live near a drug store? food market?
35. How is the family coping without you at home?
36. Is there any financial strain caused by this illness and hospitalization?

Life Style:

37. Do you work?
38. What type of work do you do?
39. Have you always done this kind of thing?
40. Do you enjoy your work?
41. How has your illness affected your work?
42. What do you like to do for fun?

43. Has your illness affected any of your hobbies or sports activities?

44. How has your illness affected your social life?

APPENDIX D

PREOPERATIVE COGNITIVE ASSESSMENT

QUESTION GUIDELINES

NO. 1 QUESTION GUIDE

1. Did you get settled into the ward all right?

   Find out where everything is?

   Any problems about that?

2. Have you had any of your special visitors?

   Prep Nurse?
   Physiotherapist?
   Intern?
   Anaethetist?
   Other?

3. Have you had your enema?

   How did you feel about that?

4. Did you sign your consent?

5. What did your anaethetist tell you?

   Your Physiotherapist?
   Your nurse?

6. How do you feel about taking a sleeping pill to-night?

7. How do you expect to feel after your needle tomorrow morning?

8. Can you remember what you have to do tomorrow morning?

9. Any questions about valuables?
   make-up?
   removables?

10. Is there anything in the pamphlet "You and Your Operation" that you don't understand or would like to talk about a little bit?

NO. 2 QUESTION GUIDE

1. Do you remember what kind of anaesthetic you will have?

2. What kind of medications are you given to make your anaesthetic work better on the evening before? the morning of surgery?

3. What fears do you think people have about an anaesthetic?

4. How will your anaesthetic be given to you?

5. How will you feel when you get your anaesthetic?

6. Have you every had an intravenous before?

7. What did you think about the intravenous, the first time you saw it? (Dispel 3 major misconceptions)

8. Why do you think you will need an intravenous after your operation?

9. How long do you expect to have an intravenous after your operation?

10. What kind of food do you expect to be able to eat when the intravenous first comes out?

11. Do you expect to have trouble with foods for any time after you go home?

12. When do you expect to first get out of bed?
    To start your leg exercises, deep breathing and coughing and turning?

13. How much moving about do you expect to do when you first get out of bed?

14. Why do we encourage you to do leg exercises?
    Deep breathing and coughing?
    Turning and getting up and walking?

15. How often do you have to do your exercises?

16. Why do we ask you to help "splint" your wound during coughing?

17. Can you give me a quick demonstration of how you will do your exercises?

18. Can you remember seeing these pictures of the O.R. and the P.A.R. or Recovery Room?

19. Is there anything in these pictures that bothers you?

20. Would you like to ask me any questions about these pictures?

APPENDIX E

POSTOPERATIVE PATIENT QUESTIONNAIRE

SECTION A

DIRECTIONS: How IMPORTANT do you think it is for a person to KNOW ABOUT the following people and procedures before having an operation like yours.

CIRCLE the number (1,2,3,4 or 5) which BEST shows how you feel about each question. Each question will have a 5-number scale which means:

5	4	3	2	1	☐	DON'T KNOW
Very Important	Quite Important	Fairly Important	Not Very Important	Not Important At All		

If you DON'T KNOW about a question and can't answer it, mark a / in the box headed DON'T KNOW.

			DON'T KNOW
1.	Who the head nurse is	5 4 3 2 1	☐
2.	What the intern or resident does	5 4 3 2 1	☐
3.	What the physiotherapist does for you	5 4 3 2 1	☐
4.	Why you have a medical history and physical examination before your operation	5 4 3 2 1	☐
5.	How the anaethetist helps you	5 4 3 2 1	☐
6.	Why you have a sleeping pill the night before the operation	5 4 3 2 1	☐
7.	Why you get a needle the morning of surgery	5 4 3 2 1	☐
8.	Why your skin is shaved before surgery	5 4 3 2 1	☐
9.	Why you sign a consent form before surgery	5 4 3 2 1	☐
10.	Why you may have an enema before surgery	5 4 3 2 1	☐
11.	Why you can't eat or drink the night before surgery	5 4 3 2 1	☐
12.	Why your valuables are locked away	5 4 3 2 1	☐

		DON'T KNOW
13. Why you remove your make-up before surgery	5 4 3 2 1	☐
14. How a general anaesthetic is given	5 4 3 2 1	☐
15. How it feels to have a general anaesthetic	5 4 3 2 1	☐
16. What the operating room looks like	5 4 3 2 1	☐
17. What the Operating Room Nurse does for you	5 4 3 2 1	☐
18. What the recovery room looks like	5 4 3 2 1	☐
19. How you are taken to the operating room	5 4 3 2 1	☐
20. Why you are checked so often in the recovery room	5 4 3 2 1	☐
21. Why you might receive oxygen by mask in the recovery room	5 4 3 2 1	☐
22. What an intravenous is	5 4 3 2 1	☐
23. Why you have an intravenous	5 4 3 2 1	☐
24. How long you will have an intravenous	5 4 3 2 1	☐
25. How you feel when you have an intravenous	5 4 3 2 1	☐
26. Where your incision will be	5 4 3 2 1	☐
27. What your dressings will be like	5 4 3 2 1	☐
28. Why you have a drain in your incision	5 4 3 2 1	☐
29. What the discharge from your incision looks like	5 4 3 2 1	☐
30. How fast your incision heals	5 4 3 2 1	☐
31. How strong the stitches are	5 4 3 2 1	☐
32. How much pain you will have	5 4 3 2 1	☐
33. How your pain is controlled	5 4 3 2 1	☐

						DON'T KNOW
34. How long your pain will last	5	4	3	2	1	☐
35. How habit-forming painkillers and sleeping pills are for you	5	4	3	2	1	☐
36. How you do postoperative exercises	5	4	3	2	1	☐
37. Why you do postoperative exercises	5	4	3	2	1	☐
38. Why the nurses keep pestering you to get out of bed and exercise when you don't feel like it	5	4	3	2	1	☐
39. Why you might have a stomach tube after surgery	5	4	3	2	1	☐
40. How it feels to have a stomach tube	5	4	3	2	1	☐
41. When your stomach tube comes out	5	4	3	2	1	☐
42. When you start eating after your operation	5	4	3	2	1	☐
43. What kinds of food you can eat after surgery	5	4	3	2	1	☐
44. When you can expect your first bowel movement	5	4	3	2	1	☐
45. When you first get out of bed	5	4	3	2	1	☐
46. When you can expect to go home	5	4	3	2	1	☐
47. When you can expect to go back to work or carry on your normal activities	5	4	3	2	1	☐
48. Why you can sometimes feel "blue" a few days after your operation	5	4	3	2	1	☐
49. The information given to you in the pamphlet "You and Your Operation"	5	4	3	2	1	☐
50. The information given to you in the sound-and-slide presentation called "Operation To-morrow"	5	4	3	2	1	☐

SECTION B

DIRECTIONS: CIRCLE the letter (A,B,C OR D) beside the answer you believe is the BEST answer to each of the following questions.

1. Leg exercises are important after surgery because they

A. help you to keep up muscle strength
B. help you to get better faster
C. speed up your blood circulation
D. prevent problems due to slow blood circulation

2. A sleeping pill the night before surgery

A. is necessary to stop worrying
B. helps you to relax and need less anaesthetic
C. is a part of the preparation for your anaesthetic
D. could be addictive and is not necessary to take

3. You are asked to support or "splint" your incision when coughing because

A. coughing might cause your incision to open
B. it makes coughing less painful
C. it takes your mind off the pain
D. you can feel your chest expand that way.

4. In order for the anaesthetist to be able to check your circulation during the anaesthetic you are asked to remove your

A. rings
B. watch
C. nail polish
D. dentures

5. A stomach tube attached to suction may be put in place through your nose because

A. your Gall Bladder isn't working any more
B. your Doctor wants to measure the drainage from your stomach
C. your bowel isn't very active
D. you will probably be nauseated and vomit otherwise

6. Your intravenous will be stopped

A. about the 4th day after surgery
B. when you are able to take fluids by mouth
C. when you feel well enough to eat
D. when you are passing gas

7. You have a drain in your incision because

A. it helps to drain off bile
B. fluids collecting in the wound can become infected
C. it helps healing
D. you have a lot of drainage after your operation

8. A general anaesthetic is when you are

A. completely asleep
B. completely free of pain
C. unconscious
D. unable to move and feel but awake

9. You can expect to go home after your operation

A. when you feel well enough
B. in 8 to 10 days
C. when your incision has healed satisfactorily
D. when you can eat without any trouble

10. After your operation you can expect to eat

A. a fat-restricted diet for 2 weeks
B. a normal diet
C. all the foods you like
D. anything that agrees with you

SECTION C

DIRECTIONS: Put a ✓ in the box provided to show how you prefer to learn about your operation before surgery. Briefly tell why you made your choice.

1. ☐ A PRIVATE SESSION WITH YOUR NURSE

2. ☐ A GROUP SESSION WHERE YOU CAN SHARE YOUR FEELINGS WITH OTHER PATIENTS

3. ☐ A CLASS

4. ☐ A COMBINATION OF ONE OR MORE OF THE ABOVE

5. ☐ OTHER

6. Please write any additional comments which you think would be helpful in planning to give other patients like yourself the information you feel is important.

COMMENTS:

APPENDIX F

FACTOR ANALYSIS
PREOPERATIVE LEARNING NEEDS

APPENDIX F
FACTOR ANALYSIS: PREOPERATIVE LEARNING NEEDS

* Item Appears In Other Factors

ITEM AND DESCRIPTION	FACTOR LOADING	h^2
FACTOR 1: 44.19% of Variance Explained		
31. How strong the stitches are	0.818	1.000
30. How fast your incision heals	0.811	1.000
24. How long you will have an intravenous	0.811	1.000
27. What your dressings will be like	0.791	0.932
33. How your pain is controlled	0.750	1.000
*34. How long your pain will last	0.635	0.966
*45. When you first get out of bed	0.595	0.98
22. What an intravenous is	0.556	0.948
29. What the discharge from your dressing looks like	0.524	1.000
44. When you can expect your first bowel movement	0.523	1.000
*37. Why you do postoperative exercises	0.411	1.000
*19. How you are taken to the operating room	0.424	0.962
*32. How much pain you will have	0.480	1.000
*41. When your stomach tube comes out	0.437	1.000
*40. How it feels to have a stomach tube	0.449	1.000
47. The information given to you in the pamphlet "Your and Your Operation"	0.462	0.928
FACTOR 2: 8.696% of the Variance Explained		
13. Why you remove your make-up before surgery	0.893	0.954
8. Why your skin is shaved before surgery	0.843	1.000
12. Why your valuables are locked away	0.815	1.000
4. Why you have a medical history and physical examination before your operation	0.761	0.978
6. Why you have a sleeping pil the night before your operation	0.680	1.000
9. Why you sign a consent before surgery	0.676	0.929
5. How the anaethetist helps you	0.402	0.989
7. Why you get a needle the morning of surgery	0.424	0.939
20. Why you are checked so often in the recovery room	0.447	0.979
11. Why you can't eat or drink the night before surgery	0.466	1.000
*49. The information given you in the pamphlet "You and Your Operation"	0.458	0.928
21. Why you might receive oxygen by mask in the recovery room	0.431	1.000

APPENDIX F - Cont'd.

ITEM AND DESCRIPTION	FACTOR LOADING	h^2
FACTOR 3: 6.685% of the Variance Explained		
3. What the physiotherapist does for you	0.832	1.000
* 5. How the anaesthetist helps you	0.768	0.989
15. How it feels to have a general anaesthetic	0.646	0.959
*37. Why you do postoperative exercises	0.544	1.000
*45. When you first get out of bed	0.563	0.98
39. Why you might have a stomach tube after surgery	0.493	1.000
14. How a general anaesthetic is given	0.475	0.971
50. The information given to you in the Slide-and-Sound Presentation "Operation To-morrow"	0.409	0.970
*20. Why you are checked so often in the recovery room	0.405	0.979
FACTOR 4: 5.7016% of the Variance Explained		
1. Who the head nurse is	0.836	0.953
18. What the recovery room looks like	0.826	0.948
2. What the intern or resident does	0.701	0.941
*19. How you are taken to the operating room	0.581	0.962
16. What the operating room looks like	0.545	0.988
*50. The information in the presentation "Operation To-morrow"	0.506	0.970
17. What the operating room nurse does for you	0.405	0.939
*49. The information given to you in the pamphlet "You and Your Operation"	0.425	0.928

APPENDIX F - Cont'd.

ITEM AND DESCRIPTION	FACTOR LOADING	h^2
FACTOR 5: 4.711% of the Variance Explained		
*32. How much pain you will have	0.658	1.000
25. How you feel when you have an intravenous	0.610	0.984
*39. Why you might have a stomach tube after surgery	0.564	1.000
*41. When your stomach tube comes out	0.514	1.000
26. Where your incision will be	0.512	0.898
*22. What an intravenous is	0.542	0.948
*34. How long your pain will last	0.460	0.966
*15. How it feels to have a general anaesthetic	0.457	0.959
23. Why you have an intravenous	0.436	0.881
*40. How it feels to have a stomach tube	0.473	1.000
FACTOR 6: 4.174% of the Variance Explained		
46. When you can expect to go home	0.808	0.973
42. When you start eating after your operation	0.689	1.000
43. What kinds of food you can eat after surgery	0.657	1.000
28. Why you have a drain in your incision	0.615	0.985
*41. When your stomach tube comes out	0.499	1.000
*26. Where your incision will be	0.491	0.898
*19. How you are taken to the operating Room	0.483	0.962
44. When you can expect your first bowel movement	0.432	1.000
*34. How long your pain will last	0.417	0.966

APPENDIX G

PATIENT COMMENTS

PREOPERATIVE LEARNING PROGRAMS

Re Need for Knowledge

"Patients should be informed; ignorance is not bliss" (INDIVIDUALIZED LEARNING GROUP)

"For some patients, perhaps most, the less they know, the better" (INCIDENTAL LEARNING GROUP)

Re Private Talk with Nurse

"I feel the nurse has to have the ability to feel out the patient and know how much she can tell the patient before the patient cracks or gets completely upset" (INDIVIDUALIZED LEARNING GROUP)

"Never having had an operation before, I personally, felt having a private talk about it the night before helped answer many questions and took away some of the tension I felt" (INDIVIDUALIZED LEARNING GROUP)

"I find it easier to ask questions when on my own rather than in a group (INCIDENTAL LEARNING GROUP)

"I do not believe that any two cases are alike" (INCIDENTAL LEARNING GROUP)

"She can fill you in on what to expect and you don't have to worry so much" (INCIDENTAL LEARNING GROUP)

"You can feel free to ask as many questions as you like about your operation" (INCIDENTAL LEARNING GROUP)

APPENDIX G - Cont'd.

"They have worked with many cases and knew what to look for and can tell you each stage you will be going through" (INCIDENTAL LEARNING GROUP)

"Some of the information they (the nurses) gave me made me a little scared, but not as much as if I had not known" (INCIDENTAL LEARNING GROUP)

Re Group Sessions

"We can calm each other down" (INCIDENTAL LEARNING GROUP)

"A group session... would put a patient's mind at ease. Worry over some of the matters can do a lot of harm. I know Operation To-morrow (slide-and-sound presentation) helped me a lot (CLASS LEARNING GROUP)

Re Individualized Learning Program

"I was very impressed with the amount of information made available to me in the form of printed and class-slide information (slide-sound presentation) (INDIVIDUALIZED LEARNING GROUP)

"I feel the movie (slide-sound presentation and talk) was a big help and we aired our thoughts and fears, but, also, a private talk with the nurse is really more helpful, especially for a person's first surgery, as he or she may be too shy or embarrassed to ask personal questions in front of other people" (INDIVIDUALIZED LEARNING GROUP)

APPENDIX G - Cont'd.

Re Explanations From the Doctor

"He is the one you are usually most confident in" (INCIDENTAL LEARNING GROUP)

"I feel he (the doctor) knows the most about my problem" (INCIDENTAL LEARNING GROUP)

"And very important is a closer communication with your doctor and surgeon and intern, and being given a choice to ask all kinds of questions about your case" (INCIDENTAL LEARNING GROUP)