

EFFECTIVENESS OF AN INSTRUCTIONAL MODULE  
ON BASIC PRINCIPLES OF NUTRITION  
DESIGNED FOR THE HOSPITAL STAFF NURSE

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A THESIS

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## TABLE OF CONTENTS

LIST OF ILLUSTRATIONS .....	vi
LIST OF TABLES .....	vii
ACKNOWLEDGEMENTS .....	viii
INTRODUCTION .....	1
STATEMENT OF THE PROBLEM .....	4
HISTORICAL PERSPECTIVE .....	5
HYPOTHESIS .....	16
DEFINITION OF TERMS .....	17
LIMITATIONS .....	18
METHODS AND PROCEDURES .....	19
STATISTICAL ANALYSIS .....	23
RESULTS AND DISCUSSION .....	24
CONCLUSIONS .....	39
RECOMMENDATIONS FOR FURTHER RESEARCH .....	40
APPENDIXES .....	41
LIST OF REFERENCES .....	105

## LIST OF ILLUSTRATIONS

	Page
1. Combined Frequency Polygons of Pretest and Posttest Scores .....	32

LIST OF TABLES

	Page
1. Measures of Central Tendency and Variability and an F-Test of Subjects by Trials Analysis of Variance .....	31
2. Comparison of Demographic Data and Pretest/Posttest Means .....	37

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## INTRODUCTION

The role of the hospital staff nurse in patient care is broad and diversified, and it requires knowledge and skills in many disciplines. One aspect of this role is the nurse's position as a "front line contact" resource individual to the hospitalized patient, which other members of the health care team do not achieve as completely. This "contact" position is primarily due to the constant involvement of the nurse with the patient. The patient is more likely to turn to the individual who appears to be directly approachable, e.g., the nurse (Jeliffe 1974). This means that patients' questions and problems, including those relating to nutrition and diet, may be directed toward the staff nurse rather than the dietitian--even though the dietitian is the individual primarily concerned with the patient's nutritional care. In dealing with these problems and questions relating to nutrition, the nurse contributes a significant amount of nutrition education, although this may be provided in an unconscious and/or unplanned manner. This type of patient nutrition education may support, negate, or neutralize the efforts of the dietitian and other members of the health care team, depending on the amount and accuracy of the nutrition knowledge possessed by the nurse (Newton, Beal, and Strauss 1967).

Since nutritional care is a part of the total health care of the patient and since the goal of the health care team is to provide quality health care, it is of the utmost importance that the staff nurse comprehends and has the ability to apply basic principles of nutrition. In so doing, the hospitalized patient receives the best in nutritional care, and the quality of the patient's total health care is upgraded.

However, nutrition courses in many nursing school curricula are limited because of requirements of other subject matter. It also has been shown that the type of nursing program completed by the nurse has an effect on the nurse's nutrition knowledge. Registered nurses who have graduated from baccalaureate nursing programs were reported to have more nutrition knowledge than registered nurses who have graduated from diploma nursing programs (Analysis of State Board Test Scores 1957; Vickstrom and Fox 1976) and more nutrition knowledge than registered nurses who have graduated from both diploma nursing programs and associate nursing programs (Harrison, Sanchez, and Young 1969; McDaniel and Savage 1974). Additionally, nurses seldom receive further nutrition education after nursing school (Vickstrom and Fox 1976). Thus, in-service nutrition education for the nurse could be very beneficial.

The Joint Commission on Accreditation of Hospitals (September 1977) has recommended that the Houston Veterans Administration Hospital include in-service nutrition education for all staff nurses in order to better equip them to deal with the nutritional care of the V. A. patient. This study was conducted to determine whether an instructional module on basic principles of nutrition would increase the nutrition knowledge of the registered hospital staff nurse. The instructional module designed for this study will provide a means for the Houston Veterans Administration Hospital Nursing Service to meet the recommendation of the Joint Commission on Accreditation of Hospitals.



## STATEMENT OF THE PROBLEM

The purpose of this study was to determine: Will an instructional module on basic principles of nutrition significantly increase the registered hospital staff nurse's nutrition knowledge? Along with an increase in the nurse's nutrition understanding and skills, the hospitalized patient should benefit through improved nutritional care provided by the registered staff nurse, and thus, improved total health care.

## HISTORICAL PERSPECTIVE

Throughout life an adequate diet is very important. Inadequate nutrition over a period of time can lead to greater susceptibility to infectious illnesses, inability to learn or work to one's full capacity, and general malaise and weakness. Recognizing the importance of good nutrition, the study of nutrition has long been a part of the nursing education curricula.

In early nursing education programs (1900-1920), emphasis in nutrition courses was placed on food preparation and meal service for the sick, because hospital food service was a function and responsibility of the nursing department. With the development of the science of nutrition and the profession of dietetics in the late 1920's, the teaching of the principles of nutrition and diet therapy, as well as their practical application, was incorporated. At this time, nursing released its responsibility for food service administration to the dietitians, and dietitians began functioning as nutrition teachers in nursing programs. By 1937, nutrition was being included in the nursing school curricula in the form of lectures, laboratory, and diet kitchen experience. As years passed, joint thought and planning by the nursing

and dietetic professions concerning the goals, content, and methods of teaching nutrition in nursing curricula became rare. Nutrition courses and diet kitchen experience were being taught without any planned relationship to the nurse's role in patient care. As a result, nurses developed unfavorable attitudes which affected their roles in the nutritional care of patients (Greene 1960).

In more recent years, there has been a steadily increasing concern about the quantity and quality of nutrition education included in programs for careers in nursing (Trooboff 1972). The patient-centered approach to nursing care and the greater recognition of the need to correlate subject matter in the nursing curricula have made it necessary for nursing faculties to become as involved in the nature of nutrition education as in other subject areas of the curricula (Grant and McCarthy 1971). In line with this movement, the Joint Committee of the National League for Nursing and the American Dietetic Association (N. L. N.--A. D. A.) in 1964 published an unofficial statement defining the objectives for nursing education in terms of expected behaviors for the practicing nurse in the areas of nutrition and diet therapy (Unofficial Statement from N. L. N.--A. D. A. 1964).

In early 1972, at the request of the Chairman of Commission V on Nutrition Education and Training, the Subcommittee

on Nutrition Education in Nursing was formed, as it was believed that there was not adequate emphasis on the role of nurses in nutrition. At the first meeting of the subcommittee in September 1972, recommendations were made in the following areas: content and distribution of nutrition in nursing curricula; nutrition instructors in nursing schools; and teaching methods employed in nutrition instruction in the nursing schools (IUNS Subcommittee on Nutrition Education in Nursing 1974).

In 1975, the second meeting of the Subcommittee on Nutrition Education in Nursing included in their recommendations that the minimum amount of hours of instruction in nutrition be sixty hours, and the amount of "integrated" nutrition taught in the nursing curricula be stated in hours. The subcommittee also recommended that the practical application of nutrition be substantially increased and integrated throughout the entire training program and that in-service training programs in nutrition for practicing nurses be instituted (Report of Second Meeting of IUNS Committee V/II 1975).

These meetings and the recommendations resulting from these meetings were especially important in light of the fact that several studies have shown the nutrition education obtained in different nursing programs was not equal. Those

nurses graduating from baccalaureate nursing programs had more nutrition knowledge than those nurses graduating from diploma nursing programs (Analysis of State Board Test Scores 1957; Vickstrom and Fox 1976) and more nutrition knowledge than nurses graduating from both diploma and associate nursing programs (Harrison et al. 1969; McDaniel and Savage 1974).

During 1956, a study was conducted by the National League for Nursing to provide the state boards of nursing with additional information about candidate achievement on the State Board Test Pool Examination for professional nurse licensure. A distinct difference was found between the knowledge of registered nurse candidates from baccalaureate nursing programs and those from diploma nursing programs in the category of the test dealing with nutrition principles and diet therapy. The registered nurse candidates from baccalaureate nursing programs scored significantly higher than the registered nurse candidates from diploma nursing programs in this category of the test (Analysis of State Board Test Scores 1957).

Harrison et al. (1969) studied a sample composed of 144 registered nurses employed in seven local health agencies in Michigan to determine if differences in nutrition knowledge continued among nurses on the job. It was found that nurses with bachelor's degrees knew significantly more

about nutrition than nurses with diploma or associate degrees. However, it also was found that on-the-job experience in public health nursing seemed to negate some of the differences due to educational level, and this effect was most pronounced in those agencies employing a nutrition consultant. On the basis of these findings, the value of in-service nutrition education for nurses was underscored.

McDaniel and Savage (1974) studied a sample of 138 registered nurses in various types of nursing positions (located in seven different states) to determine, among several factors, the diet therapy educational needs of registered nurses. The study revealed that test scores on diet therapy knowledge were not significantly different between associate and diploma nursing program graduates, but that baccalaureate nursing program graduates scored significantly higher ( $p < .05$ ) than the other two groups. Among the conclusions reached were that diet therapy should be taught in all nursing school curricula and should be an integral part of broader nursing courses.

Still another study conducted by Vickstrom and Fox (1976) with 500 registered hospital nurses revealed that baccalaureate program nurses had a higher level of nutrition knowledge than those who had graduated from diploma nursing programs. Nutrition knowledge was significantly related to

nurses' attitudes toward their role in nutrition education and in their perception of the value of the work of the health care team, indicating that knowledge may inspire confidence and hence improve the nurses' attitudes toward these aspects of nutrition. Older nurses had more favorable attitudes toward nutrition but were less knowledgeable than younger nurses, suggesting again that nutrition classes may be a desirable component of in-service education of nurses.

The importance of nurses who have graduated from baccalaureate, diploma, and associate nursing programs having a strong understanding of basic nutrition principles cannot be overlooked. Today's professional nurse is expected to take part in the planning and delivery of total patient care, and nutritional care is a part of this "total patient care."

Elliott (1972) explains the nurse's responsibility as follows:

With responsibility to the patient and the physician for the total therapeutic regimen, the nurse must understand the total prescription--the treatments, medicine, diet, and environmental conditions to be maintained.

The hospital nurse is called upon routinely to interpret the doctor's order for a diet and the dietitian's plan for carrying it out both in the hospital and at home. This requires a thorough knowledge of the basic principles of nutrition in health and disease, an understanding of the cause and course of various diseases, and the objectives to be achieved through dietary control (Thigpen and Mitchell 1957).

The role of the nurse as a nutrition educator has long been recognized. Nearly three decades ago Rynbergen (1950) stated:

The nurse is expected to dispense information and to teach as never before. This is as true at the bedside as it is in public health or in industry; and equally true whether she is dealing with private patients or with ward patients.

However, the need for nursing involvement in nutrition education of the hospitalized patient and the individual nurse's perception of his/her role in nutrition education do not always correlate. Kurtz (1975) reported that the present perception of the nurse's role and responsibilities in nutrition education was clouded by many ambiguities. Due to the many changes in dietetics and the changing role of the nurse, there seemed to be confusion between nutrition objectives and the present hospital nurse's perception of his/her role in nutritional care of patients in a multidisciplinary health care team.

To clear away some of this confusion, Kurtz (1975) conducted a study to determine current opinions held by administrative and staff nurses at Indiana University Hospital on the nutrition objectives for nurses' involvement in nutrition and diet therapy set down by the N. L. N.--A. D. A. in 1964. The study revealed wide variations in nursing concurrence with N. L. N.--A. D. A. objectives for nursing



involvement in nutritional care--pointing out a need for further clarification of the role of the nurse in nutritional care.

Newton et al. (1967) conducted a study revealing that the further away nurses were from the patient and the higher staff position they held, the higher was the level of verbal priority placed on nutrition in patient care. Vickstrom and Fox (1975) further revealed in their study that as a whole, registered hospital staff nurses believed that their own role in patient nutrition education should be supportive rather than active. However, the nurses expressed the belief that because of their close contact with and influence upon patients, they need positive attitudes toward nutrition and should encourage patients to follow dietary instructions. The nurses were better informed about basic nutrition principles than about their application, whereas in therapeutic nutrition the opposite was true.

McDaniel and Savage (1974) studied the actual amount of diet instructions given by registered nurses and the need for continuing education in diet therapy for nurses. It was found that close to 44 percent of the nurses were giving at least one diet instruction per month and that 85 percent of the 138 nurses studied believed continuing education in diet therapy would be beneficial to their patient care. These

studies all point to the need for continuing or in-service nutrition education for nurses.

Modular instruction is one method of instruction currently being used in nursing education, in nutrition education, and in a host of other disciplines. The use of media and modular instruction to replace or supplement traditional teaching methods is gaining wide support among both learners and instructors.

Griffin, Kinsinger, Pitman, and Kessler (1966) reported the use of a closed circuit television system in teaching nursing students at Bronx Community College. A research design was developed to test the hypothesis that regular analysis of patient care by means of immediate videotape playback would affect student learning. In this study the investigators employed principles that have come to be recognized as major advantages of modular instruction: (1) the student must learn everything for himself and by his own activity; (2) the student can learn at his/her own rate; and (3) the student can learn more through immediate reinforcement of each step learned.

Kiang (1970) used programmed nutrition instruction with students in a five-year baccalaureate nursing program at Columbia University. It was found that the students who received programmed instruction in basic nutrition achieved

significantly higher scores than a similar group of students from the same school who had studied assigned readings covering basic nutrition.

Short (1975) reported that the use of modular instruction in basic nutrition courses open to all students at Syracuse University resulted in the tripling of enrollment in these classes. Basic nutrition and food science courses were taught by taped modules integrated with slides, videotapes, compressed audio tapes, discussion groups, and computer-assisted instruction using workbooks. It was found that much more information could be presented in a taped session than in a lecture, since the instructor is covering the objectives and does not wander from the subject. The students also could stop the tape and visuals at any point and rerun them. Worksheets accompanying the module contained objectives of the module, an outline of the lesson, questions students should be able to answer, and information sheets on the visuals. These materials made note-taking while viewing slides and films unnecessary.

Chinn and Hunt (1975) studied the use of self-directed learning modules in teaching ambulatory child nursing to graduate nursing students. The advantages of modular instruction they reported included: (1) the learner's beginning knowledge, as assessed through the pretest, makes both

learner and instructor aware of the learner's knowledge base--this acknowledgement of beginning competence gives the learner confidence to proceed and a realistic assessment of the areas in which the learner is weakest; (2) modular instruction is self-paced, allowing learners with varying degrees of experience and knowledge to move at their own pace; (3) levels of competence are clearly defined in modular instruction, so successful completion of the module can be taken as an indicator of a specific standard of achievement. These findings all support the use of modular instruction as an effective learner tool.

## HYPOTHESIS

The research hypothesis was: An instructional module on basic principles of nutrition will increase significantly the registered hospital staff nurse's nutrition knowledge. The independent variable was completion of the instructional module, and the dependent variable was the behavior demonstrated by the nurse upon completion of the module (i.e., an increase, decrease, or no change in nutrition knowledge as measured by comparison of pretest and posttest scores). A positive difference between completion of the module and nutrition knowledge was expected.

The null hypothesis tested in this study was: An instructional module on basic principles of nutrition will not increase significantly the registered hospital staff nurse's nutrition knowledge. The critical level of probability for testing the null hypothesis in this study was  $p < .05$ .

## DEFINITION OF TERMS

1. Associate nursing program--an accredited program for registered nurses in which the nurse receives an associate degree in nursing.
2. Associate program nurse--registered nurse who has attained his/her nursing education through an accredited associate nursing program.
3. Baccalaureate nursing program--an accredited program for registered nurses in which the nurse receives a B.S. degree in nursing.
4. Baccalaureate program nurse--registered nurse who has attained his/her nursing education through an accredited baccalaureate nursing program.
5. Basic nutrition principles--refers to both basic normal and therapeutic nutrition principles.
6. Diploma nursing program--an accredited program for registered nurses in which the nurse receives a diploma in nursing.
7. Diploma program nurse--registered nurse who has attained his/her nursing education through an accredited diploma nursing program.
8. Hospital staff nurse--nurse at any level working in the hospital setting who has daily direct patient contact.
9. Registered hospital staff nurse--registered nurse working in the hospital setting who has daily direct patient contact.

## LIMITATIONS

Subjects completed the module during their regular working hours. The full concentration of the subjects on the module may not have been attained due to other pressing thoughts the subjects may have had when required to leave their primary duty to complete the module. Outside distractions away from the module came as a result of the location in which the module was administered. Participation in the study for most of the subjects was contingent upon completion of the module on the ward solarium--due to short staffing and the possible need for the subject's assistance on the ward in case of an emergency. The presence of other personnel on break in the solarium and the interruption of completion of the module while subjects took care of pending problems on the ward were problems.

## METHODS AND PROCEDURES

### Sampling

Only registered staff nurses employed by the Houston Veterans Administration Hospital were included in the study. Nurses were given a questionnaire prior to commencement of the study, which briefly described the study and elicited general information concerning usual work schedule, age, experience as a registered nurse, educational background, and willingness to participate in the study (appendix F). Those nurses indicating willingness to participate in the study completed a written consent form as required by the Human Research Review Committee, which is in accordance with the guidelines of the Department of Health, Education, and Welfare (appendix G). A sample size of twenty-five nurses participated in the study.

### Instrumentation

The instructional module consisted of a pretest, a slide-tape presentation accompanied by practice activities, and a posttest. A module workbook (appendix B) contained the pretest and posttest, the practice activities accompanying the slide-tape presentation, and an evaluation form for the subjects to complete following the module. The pre- and



posttests were identical twenty-question multiple-choice tests. However, the order of questions and responses to each question were different on the two tests in order to decrease test bias. The slide-tape presentation was approximately twenty-three minutes. Halfway through the slide-tape presentation, and again following the slide-tape presentation, the learner was referred to practice activities in the module workbook which reinforced the material covered in the slide-tape presentation. The learner was asked to complete an evaluation of the module. The evaluation consisted of ten statements to which the learner was to react on a six point scale ranging from "strongly disagree (1)" to "strongly agree (6)."

The module was administered to each of the twenty-five nurses individually or on a small group basis (two per group) over a two week period. It was completed on the ward solarium or ward conference room by twenty-two of the subjects and in the medical library by three of the subjects. A Caramate (on which to view the slide-tape presentation), the module workbook, and a pen or pencil were the only materials needed. Comparison of pretest and posttest scores by a subjects by trials analysis of variance was used in testing the null hypothesis that an instructional module on basic principles of nutrition will not increase significantly the registered hospital staff nurse's nutrition knowledge.

A pilot study was conducted on a twenty-nurse sample representative of the subjects in the study group. An item analysis was computed on the posttest scores for the sample of twenty nurses to measure reliability of the testing instrument. Validity of the testing instrument was determined by a panel of three registered dietitians employed by the Houston Veterans Administration Hospital (appendixes D and E).

#### Data Gathering

Total time for completion of the module and evaluation was approximately seventy-five minutes: fifteen minutes for the pretest; forty-five minutes--slide-tape presentation and workbook activities; and fifteen minutes--posttest and evaluation. Answers for both the pretest and posttest were marked in the workbook by the subject, transferred to mark sense scoring sheets by the investigator, and analyzed via computer programming techniques. Each nurse was given a number to identify his/her answer sheets, which was consistent for both tests.

Cost for module materials (slides, audio tape, and workbooks) was undertaken by the Houston Veterans Administration Hospital, since the module was given to Nursing Service to be used for in-service nutrition education for all staff nurses upon completion of this study--as needed to meet

the Joint Commission for Accreditation of Hospitals (JCAH) recommendation. Audiovisual equipment used for the slide-tape presentation (Caramate) was available through Medical Media at the hospital.

Incentives for participation by the subjects were:

(1) the module should benefit the nurse by increasing his/her nutrition knowledge and ability to apply this knowledge--in turn, his/her confidence and ability in dealing with patients' nutrition problems and questions should increase; (2) the registered nurse probably will be asked by Nursing Service to complete the module in the near future anyway, in order to meet JCAH recommendations for in-service nutrition education for staff nurses.

## STATISTICAL ANALYSIS

Data was interval level and was analyzed using Program ANOVAR (Veldman 1967), a subjects by trials analysis of variance, to determine whether there was a significant difference between pretest and posttest scores. The dependent and independent variables in this study were nutrition knowledge of the nurse and completion of the instructional module respectively.

Testat (Veldman 1967) was applied to the posttest scores in the pilot study to determine inter-item reliability. Testat was applied to both the pretest and posttest scores in the experimental study to determine inter-item reliability and to provide descriptive statistics.

## RESULTS AND DISCUSSION

From the universe of registered hospital staff nurses employed by the Houston Veterans Administration Hospital, a sample size of thirty registered staff nurses agreed to participate in the study. However, at the time the study was conducted, two of the nurses were no longer employed by the Houston Veterans Administration Hospital, two could not be relieved from their primary duty to complete the module, and one was on annual leave--reducing the sample size to twenty-five. This sample size was considered adequate to test the null hypothesis. The sample was considered to be representative of the universe of registered hospital staff nurses in that it consisted of nurses ranging in age from twenty-two to sixty-five years with experience of less than one year to thirty-three years and with educational backgrounds in the three types of nursing programs which prepare an individual for nursing registration (associate, diploma, and baccalaureate programs). The subjects' primary duty was in one of the following services: pulmonary disease, general medicine, surgery, psychiatry, or nursing home care.

Sampling was accidental. Subjects' consent to participate in the study was elicited through a questionnaire

(appendix F) distributed one to two months before initiation of the study. The majority of questionnaires were distributed to the subjects and collected from the subjects by the head nurse on each ward. Thus, the presence or absence of cooperation and interest in the study on the part of the head nurse played a major role in the participation of subjects on the different wards. This interest and cooperation was also a major factor in scheduling the subjects to complete the module and in the availability of the subjects to complete the module when the appointed time came. Two nursing supervisors distributed and collected the questionnaires from the nurses on the wards in their service, rather than having the head nurses on their wards complete the task. In addition, the investigator distributed questionnaires to the individual nurses on two wards and had an opportunity to further explain the study--which increased participation on these two wards. A more complete explanation of the purpose of the study to the individual nurses on all of the wards might have increased subject participation. Three newly-employed nurses agreed to participate in the study after the study was underway, so these three nurses did not complete a questionnaire, but verbally were asked the information elicited in the questionnaire. Since participation was voluntary, the sample probably was biased toward those nurses who had an interest in

nutrition or in furthering their education in an area involved in patient care. However, several of the nurses expressed a dislike for the study of nutrition prior to completing the module, and many of the nurses expressed concern over their lack of nutrition knowledge and the effect it would have on their pretest scores. They were assured by the investigator that the test scores would be used only to determine if the module was effective in teaching nutrition and not how much they already knew about basic nutrition.

The subject matter of the module was based on the need the Houston Veterans Administration Hospital Nursing Service had for basic nutrition education (in-service) for all staff nurses employed by this institution. This need was the result of a recommendation by the Joint Commission on Accreditation of Hospitals following their September, 1977, inspection of the Houston Veterans Administration Hospital. Thus, the module dealt primarily with basic nutrition and emphasized those aspects of basic nutrition that the investigator thought would be most beneficial to the staff nurse.

The module was composed of a pretest, a slide-tape presentation accompanied by practice activities, and a post-test. A module workbook (appendix B) contained the pretest and posttest, the practice activities accompanying the slide-tape presentation, and an evaluation form for the subjects

to complete following the module. Step-by-step instructions for completion of the module also were given in the module workbook. Subjects began with a review of the terminal performance objectives of the module which were to: (1) identify the role an adequate intake of calories and specified nutrients plays in achieving and/or maintaining health; (2) select common food sources of specified nutrients; (3) identify amounts of specified nutrients and foods from the Basic Four Food Groups that are needed by the healthy adult. Subjects then completed the module pretest. The pretest and posttest were identical twenty-question multiple-choice tests (choice of four responses per question). However, the order of questions and responses to each question were different on the two tests in order to decrease test bias. Next, subjects were instructed in the workbook to begin the slide-tape presentation. The slide-tape presentation (appendix C) was approximately twenty-three minutes in length and had a cartoon-type format in order to make presentation of the module material more entertaining. The slide-tape presentation was viewed on a Caramate, which better facilitated movement of the slide-tape presentation to the various wards for subject completion of the module. Approximately halfway through the slide-tape presentation, the subject was referred back to the workbook to complete Activity I. Activity I consisted of a



Case Study and five multiple-choice questions, designed to reinforce the material covered in the first half of the slide-tape presentation. The subject then was instructed to view the second half of the slide-tape presentation. Following completion of the slide-tape presentation, the subject was referred again to the workbook to complete Activity II practice problems (six multiple-choice, matching, and fill-in-the blank questions designed to reinforce the material covered in the second half of the slide-tape presentation). In both Activity I and Activity II, the subject was given the correct answers to the practice problems following their completion. Finally, the subject was instructed to complete the module posttest and evaluation. The evaluation consisted of ten statements about the module to which the subject was to react on a six-point scale ranging from "strongly disagree (1)" to "strongly agree (6)." Ten of the subjects completed the module in a group situation (two subjects per group), while fifteen of the subjects completed the module on an individual basis.

A pilot study was conducted on a twenty-nurse sample representative of the subjects in the study group to determine reliability of the testing instrument. Testat (Veldman 1967) was the program applied to the posttest scores of the twenty nurses in the pilot study to make this determination.

Reliability of the testing instrument was found to be .85, indicating that the test was reliable. Two items produced an average difficulty of less than .80 (question 4-- .60 and question 11-- .30) and were changed following the pilot study in order to clarify them and make them more reflective of the content of the module. Two of the workbook practice problems were also modified following the pilot study (appendix B--Module Revisions). Workbook practice problem 3 (Activity II) was revised in conjunction with the revision of question 11 on the module posttest to reinforce the information elicited in question 11. Workbook practice problem 5 (Activity II) was divided into two questions, problems 5 and 6, upon recommendation of one member of the Panel of Experts used in establishing validity of the testing instrument (appendix D). The question was divided in order to clarify and enhance understanding of the material. The mean score on the twenty-question posttest was 16.75--coinciding with a level of 85 percent competency.

Testat (Veldman 1967) was applied to the pretest and posttest scores of the twenty-five subjects in the experimental study to determine inter-item reliability and to provide descriptive statistics. Program ANOVAR (Veldman 1967), a subjects by trials analysis of variance, was also computed to determine whether there was a significant difference

between pretest and posttest scores. Results of these two tests are listed in table 1.

There were twenty questions on both the pretest and posttest. The mean score on the pretest was 12.28--representing 60 percent competency, the median score was 12, and the bimodal score was 12 and 14. The pretest scores with the mean, median, and mode so nearly the same simulate the normal curve. The mean score on the posttest was found to be 17.88--representing 90 percent competency, the median score was 19, and the mode was 20. These posttest values represent a clustering of scores in the high percentiles or a skewing of the normal curve to the left. The skewness of pretest scores was  $-.32$ , as compared to a skewness of posttest scores of  $-.75$ . Combined frequency polygons of the pretest and posttest scores are given in figure 1. The group started out homogeneous (as seen by pretest score frequency polygon simulating the normal curve), but as a result of the instructional module, the group was no longer homogeneous in relation to the normal curve, but was skewed far to the left. Sixteen (64 percent) of the subjects attained a score of 18 to 20 on the posttest, representing a competency level of 90 percent or above. Although learner achievement is many times distributed in approximately normal form, variation from the normal curve is not necessarily a negative

TABLE 1

MEASURES OF CENTRAL TENDENCY AND VARIABILITY AND  
AN F-TEST OF SUBJECTS BY TRIALS ANALYSIS OF VARIANCE

Statistics		Pretest	Posttest
Number		25	25
Mean Score		12.28	17.88
Median Score		12	19
Mode Score		12 and 14	20
Skewness		-.32	-.75
Standard Deviation		2.61	2.22
Standard Error of Test Mean		.53	.45
Variance		6.79	4.94
Range		11	8
Minimum Score		7	13
Maximum Score		17	20
Posttest Reliability	F-Ratio	Degrees of Freedom	Probability Level
.65	126.62	1/49	$p < .00001$

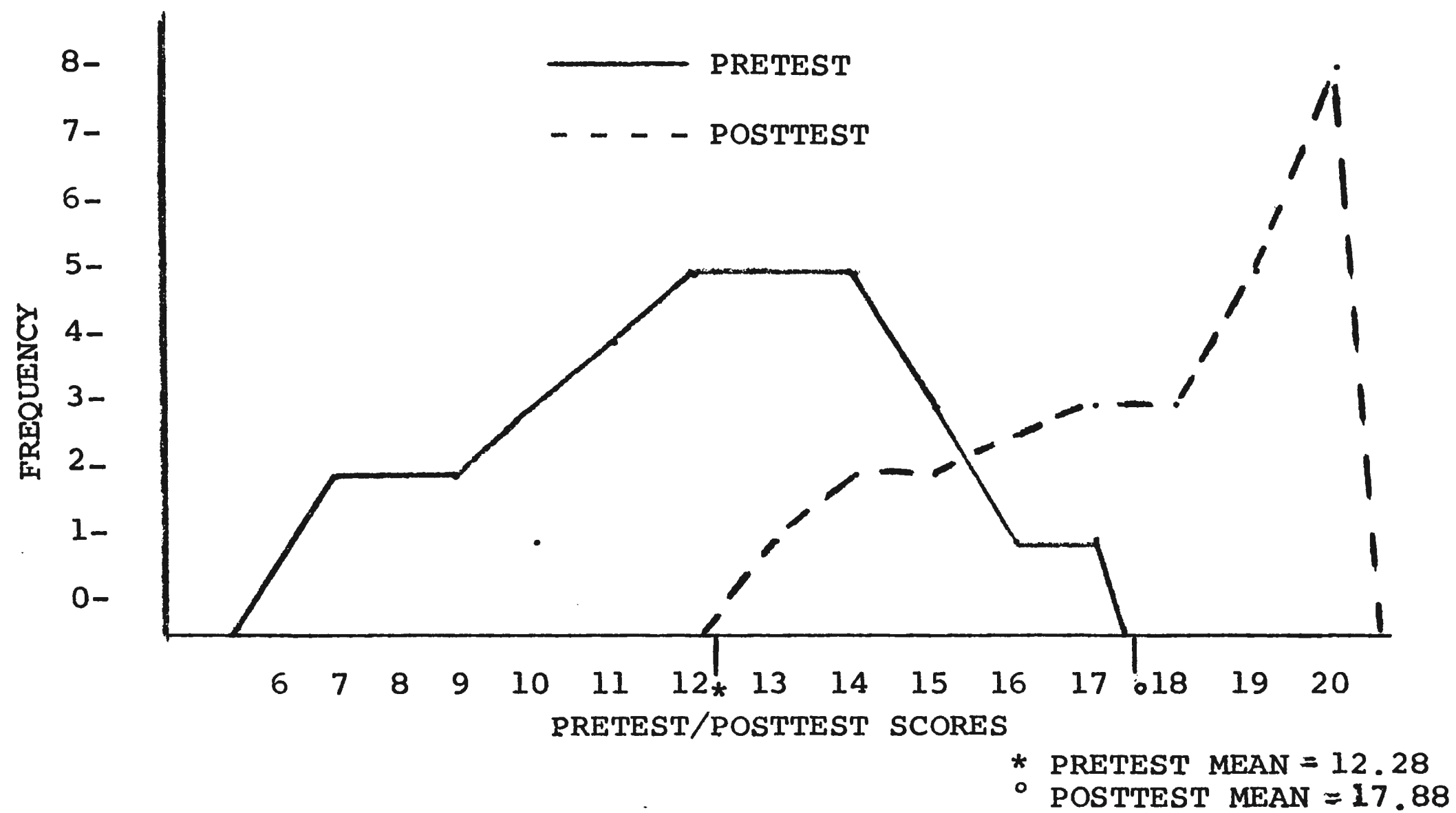


FIGURE 1. COMBINED FREQUENCY POLYGONS OF PRETEST AND POSTTEST SCORES

phenomenon. When a learner attains a specified high level of achievement in a particular subject area, he may be said to have achieved mastery learning of that particular subject matter. When a large percentage of the learners in a group achieve mastery learning of a subject matter, distribution of their scores in the form of a frequency polygon will reveal a variation from or a skewing of the normal curve (Bloom, Hastings, and Madaus 1971). Comparison of the pretest and posttest frequency polygons in figure 1 demonstrate this skewing of the normal curve following administration of the instructional module and reveal that a large percentage of the subjects in the study achieved mastery learning of the module content. Analysis of the difference between pretest and posttest scores using Program ANOVAR (Veldman 1967) yielded an F-ratio of 126.62 with 1/49 degrees of freedom, which was highly significant ( $p < .00001$ ). As a result, the problem statement, "Will an instructional module on basic principles of nutrition significantly increase the registered hospital staff nurse's nutrition knowledge?" was answered positively. The null hypothesis, "An instructional module on basic principles of nutrition will not increase significantly the registered hospital staff nurse's nutrition knowledge," was rejected.

The standard deviation of the pretest scores was 2.61 and revealed that approximately 96 percent of the pretest

scores fell within the range of 7.06 to 17.50. The standard deviation of the posttest scores was 2.22 and revealed that approximately 96 percent of the posttest scores fell within the range of 13.44 to 20.

The standard error of the pretest mean was .53, so the probability is approximately .95 that the true pretest mean lies within the interval 11.22 to 13.34. The standard error of the posttest mean was .45, so the probability is approximately .95 that the true posttest mean lies within the interval 16.98 to 18.78.

The range of scores was 11 on the pretest with a minimum score of 7 and a maximum score of 17. The range of scores was 8 on the posttest with a minimum score of 13 and a maximum score of 20. Variance on the pretest was 6.79 and was 4.94 on the posttest. Variance is a measure of the spread of the scores about the mean and describes the extent to which the scores differ from each other. The wide variance in pretest scores could be a result of the differences in age, experience, and educational background of the nurses in the study. The variance in posttest scores could be a result of the differences in ability of the nurses to learn via the instructional module. Variance in both pretest and posttest scores could be a result of the presence or absence of outside distractions away from the module. Since the module was

primarily administered in the ward solariums, the presence of other personnel on break in the solariums, and the interruption of completion of the module while subjects took care of pending problems on the wards were problems. Administration of the module in a quiet room away from the subject's ward would have been a good solution to the above mentioned problems; however, participation in the study for most of the subjects was contingent upon completion of the module on the ward--due to short staffing and the possible need for the subject's assistance on the ward in case of an emergency.

Reliability of the posttest was .65. This was a decrease from the posttest reliability of .85 as determined in the pilot study. The tests were identical except for the two questions (4 and 11) which were revised after the pilot study in order to increase reliability of the posttest in the experimental study. In the experimental study, 75 percent of the subjects chose the correct answer on question 4 as compared to only 60 percent in the pilot study. On question 11, 67 percent of the subjects in the experimental study chose the correct answer, while only 30 percent of the subjects in the pilot study chose the correct answer. Thus, revision of these two questions following the pilot study did reduce ambiguity and clarify understanding of the material. The decrease in reliability between pilot and experimental studies is thought



to be the result of the mastery learning effect (Bloom et al. 1971) seen in the experimental study. The large number of subjects in the experimental study that obtained high scores on the posttest lowered the measured reliability of the posttest.

A comparison of demographic data elicited from the preliminary questionnaire (appendix F) and pretest/posttest means is given in table 2. Due to the uneven number of subjects in the various categories, no conclusions could be drawn about the relation of test scores to the three demographic factors. It is interesting to note, however, that the seven subjects with baccalaureate nursing degrees did have a pretest mean over three points above the remaining subjects who had associate or diploma nursing degrees. A higher level of nutrition knowledge of registered nurses graduating from baccalaureate programs was noted in the literature (Analysis of State Board Test Scores 1957; Harrison et al. 1969; McDaniel and Savage 1974; Vickstrom and Fox 1976) and may be a result of greater emphasis placed on nutrition education in baccalaureate nursing programs.

Twenty-three of the twenty-five subjects completed the module evaluation form (appendix B). Nineteen of the twenty-three (82.6 percent) agreed with all ten statements on the form (ratings of 4 to 6). Two of the subjects (8.7 percent)

TABLE 2

## COMPARISON OF DEMOGRAPHIC DATA AND PRETEST/POSTTEST MEANS

Demographic Variable	Subject Number	Pretest Mean	Posttest Mean
<u>Age Group</u>			
22-35 years	15	12.87	18.67
36-50 years	9	11.33	16.89
51-65 years	1	7	15
<u>Nursing Degree</u>			
Baccalaureate	7	14.57	19.14
Diploma	13	11.23	16.92
Associate	5	10.80	18.60
<u>Experience as a Registered Nurse</u>			
1-4 years	7	11.71	18.71
5-15 years	9	13.67	18.56
16-33 years	9	10.78	16.56

disagreed with all ten statements (ratings of 1 to 3). One subject agreed with eight of the statements and disagreed with two (3 and 7)--that the subject matter of the module was covered adequately and that the audiovisual presentation maintained her interest. The remaining subject agreed with nine of the statements and disagreed with one (8)--that the pacing of the audiovisual presentation was appropriate.

(She thought it was too fast.) Some of the comments made on the evaluation forms were that the module was entertaining and beneficial to the nurse, that more nutrition programs along this line be provided for all ward nursing staff, and that more emphasis be placed on some parts of the subject matter in the module. This latter comment was made on four occasions by nurses who wanted more detailed nutrition information in the nutritional problem areas most frequently encountered on their particular wards--such as diabetes, sodium and potassium imbalance, etc.

## CONCLUSIONS

In light of the statistical results obtained, the problem statement, "Will an instructional module on basic principles of nutrition significantly increase the registered hospital staff nurse's nutrition knowledge?", was answered positively. In turn, the null hypothesis, "An instructional module on basic principles of nutrition will not increase significantly the registered hospital staff nurse's nutrition knowledge," was rejected. The instructional module was effective in increasing the nutrition knowledge of the sample studied, and mastery learning (Bloom et al. 1971) of the module content was achieved by a majority of the subjects.

From the module evaluations received, it appears that this type of in-service programmed nutrition instruction was well-liked by the sample of registered nurses studied and could be beneficial for other levels of nursing personnel. Further programmed nutrition and diet therapy instruction presented along these same lines might also be beneficial for the in-service education of the hospital staff nurse.

## RECOMMENDATIONS FOR FURTHER RESEARCH

Further research in this area might include increasing the sample size and using random sampling. With a larger random sample, the effects of such factors as educational background and amount and type of work experience on nutrition knowledge could be seen.

The use of a control group and the possible use of other teaching methods to compare with the effects of the programmed instruction would be beneficial. Comparison of different types of programmed instruction--such as a linear programmed text versus a branched programmed text using a variety of media might also be beneficial.

The use of this type of in-service nutrition education could be studied with a sample of licensed vocational nurses or nursing assistants. Many times these are the individuals who are actually feeding the hospitalized patient, and thus, have close contact with the patient at meal periods.

APPENDIX A  
MODULE LEARNING OBJECTIVES  
AND FLOWCHART

## MODULE LEARNING OBJECTIVES

Competency Use the basic principles of nutrition in providing nutritional care to the hospitalized patient.

T.P.O. 1.1 After completing the instructional module, the staff nurse will identify the role an adequate intake of calories and specified nutrients plays in achieving and/or maintaining health. Reference for evaluation is the module itself.

E.O. 1.1.1 The staff nurse will recognize the roles that major nutrients play in achieving and/or maintaining health.

L.A. 1.1.1.1 Complete the instructional module entitled, "Nutritional Care."

L.A. 1.1.1.2 Review Modern Nutrition in Health and Disease, 5th Edition, by R. S. Goodhart and M. E. Shils, Chapters 1-6, 9.

L.A. 1.1.1.3 Review Normal and Therapeutic Nutrition, 14th Edition, by Corinne H. Robinson, Chapters 4-12.

L.A. 1.1.1.4 Consult dietitian.

T.P.O. 1.2 After completing the instructional module, the staff nurse will select common food sources of specified nutrients. Reference for evaluation is the module itself.

E.O. 1.2.1 The staff nurse will recognize foods that contain significant amounts of major nutrients.

L.A. 1.2.1.1 Complete the instructional module entitled, "Nutritional Care."

L.A. 1.2.1.2 Review the Basic Four Food Groups.

L.A. 1.2.1.3 Review Food Composition Table.

L.A. 1.2.1.4 Consult dietitian.

T.P.O. 1.3 After completing the instructional module, the staff nurse will identify amounts of specified nutrients and foods from the Basic Four Food Groups that are needed by the healthy adult. References for evaluation are the Recommended Daily Allowances and the Basic Four Food Groups.

E.O. 1.3.1 The staff nurse will be familiar with the Recommended Daily Allowances Table and its use.

L.A. 1.3.1.1 Complete the instructional module entitled, "Nutritional Care."

L.A. 1.3.1.2 Review the Recommended Daily Allowances Table.

L.A. 1.3.1.3 Consult dietitian.

E.O. 1.3.2 The staff nurse will be familiar with the Basic Four Food Groups and the recommended servings from each group.

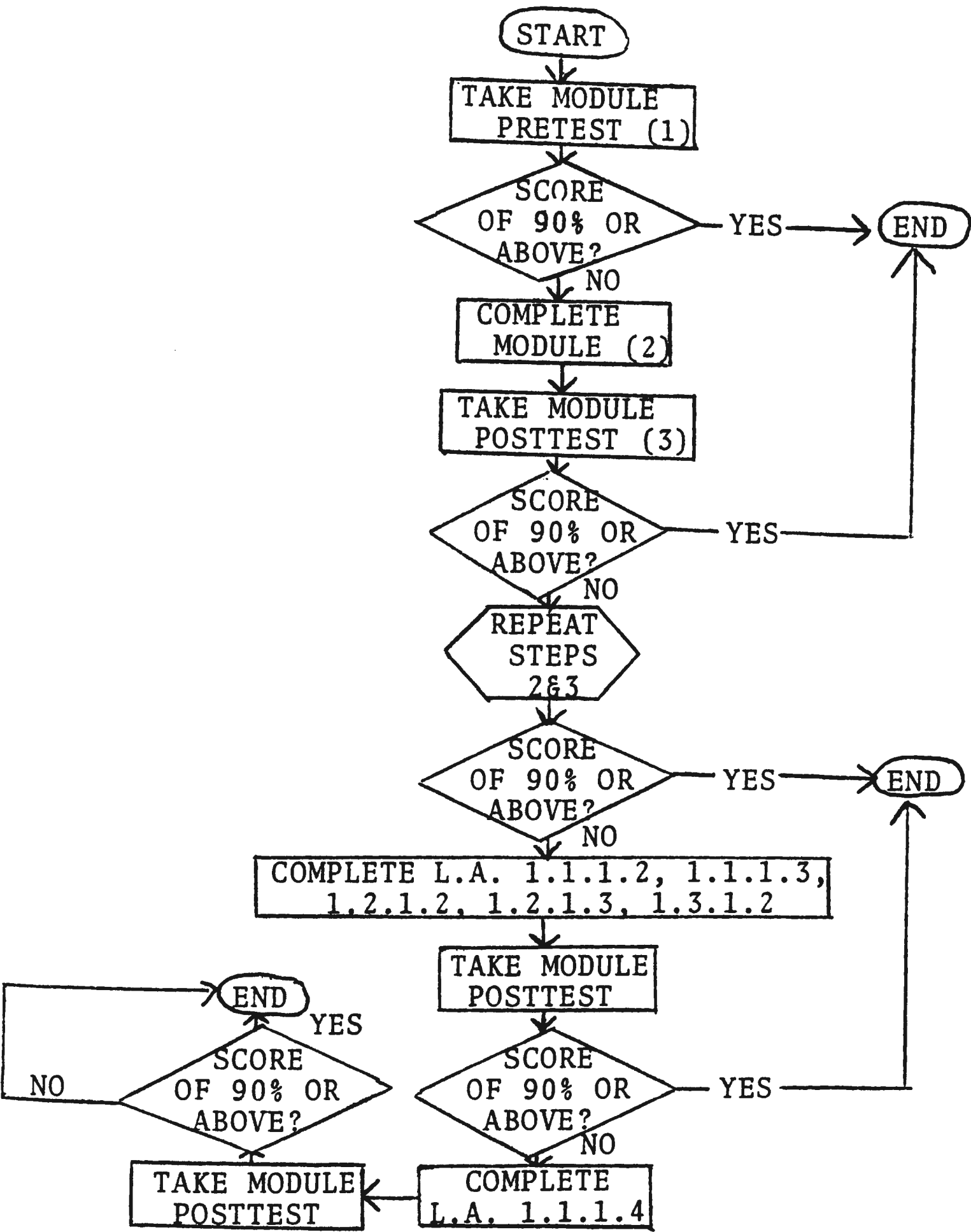
L.A. 1.3.2.1 Complete the instructional module entitled, "Nutritional Care."

L.A. 1.3.2.2 Review the Basic Four Food Groups.

L.A. 1.3.2.3 Consult dietitian.



MODULE FLOWCHART



APPENDIX B

NUTRITIONAL CARE  
WORKBOOK AND STUDY GUIDE

NUTRITIONAL CARE  
WORKBOOK AND STUDY GUIDE

by  
Marilyn Neely

This instructional module is designed to increase the basic nutrition knowledge of the hospital nurse. Since the nurse is involved with the total health care of the hospitalized patient, and nutritional care is a part of total health care, it is important that the nurse comprehends and can apply basic principles of nutrition.

Upon completion of the module, the nurse should be able to:

- (1) T.P.O. 1.1 Identify the role an adequate intake of calories and specified nutrients plays in achieving and/or maintaining health.
- (2) T.P.O. 1.2 Select common food sources of specified nutrients.
- (3) T.P.O. 1.3 Identify amounts of specified nutrients and foods from the Basic Four Food Groups that are needed by the healthy adult.

The module will consist of a twenty-question multiple choice pretest, a twenty-three minute slide-tape presentation accompanied with workbook practice activities, and a twenty-question multiple choice posttest. You will begin by completing the module pretest.

NOW TURN THE PAGE AND COMPLETE THE MODULE PRETEST.

## PRETEST

Circle the correct answer. There is only one correct answer for each question.

1. High quality protein is needed in the diet to build and replace body cells. Which of the following are sources of high quality protein?
  - a. Cheese, fish, milk, eggs.
  - b. Porkchop, bran, turkey, gelatin.
  - c. Eggs, milk, enriched noodles, beef.
  - d. Chicken, bacon, gelatin, ham.
2. The average healthy adult needs approximately \_\_\_\_\_ grams of protein each day.
  - a. 25-45
  - b. 45-65
  - c. 75-95
  - d. 95-115
3. A well-balanced meal pattern includes a mixture of foods containing carbohydrate, protein, and fat. An adequate amount of carbohydrate and fat in the diet ensures that:
  - a. Weight loss will be unlikely to occur.
  - b. Stored fat will be used to meet energy needs.
  - c. Foods from each of the Basic Four will be consumed.
  - d. Protein won't be broken down to meet energy needs.
4. When an individual consumes a diet that provides more calories than he/she needs, the excess calories will be stored as fat:
  - a. Only if the diet is high in fat.
  - b. Regardless of the types of foods consumed.
  - c. Unless high-fiber foods are also consumed.
  - d. Unless the diet is high in protein.

5. An increase or a deficit of \_\_\_\_\_ calories above/below energy needs is needed to gain or lose one pound of body fat.
- a. 2000
  - b. 2500
  - c. 3000
  - d. 3500
6. In the healthy adult, the main function of carbohydrate in the diet is to:
- a. Facilitate digestion of nutrients.
  - b. Build and replace body cells.
  - c. Meet energy requirements.
  - d. Transport vitamins for absorption.
7. The Recommended Dietary Allowances are designed for:
- a. Maintenance of good nutrition of most healthy persons in the United States.
  - b. Calculation of exact nutrient needs of the healthy individual in the United States.
  - c. Calculation of nutrient needs of persons suffering from disease or injury.
  - d. Calculation of reduction, diabetic, and other special diets.
8. The average healthy adult needs between 1500 and 3000 calories per day to meet energy needs. The recommended number of servings from each of the food groups in the Basic Four Food Groups provides:
- a. An adequate amount of nutrients, but not enough calories for the average individual.
  - b. An adequate amount of nutrients and calories for a very active or large individual.
  - c. An adequate amount of nutrients and calories for an individual suffering from injury or disease.
  - d. An adequate amount of nutrients, but too many calories for the average individual.

9. Gram per gram, carbohydrate contains:
- About the same calories as fat.
  - About the same calories as protein.
  - About the same calories as protein and fat.
  - More calories than both protein and fat.
10. Hypertensive patients are usually placed on low sodium diets. A diet that is highly restrictive in sodium content will also be restrictive in:
- All carbohydrate-containing foods.
  - Foods from animal sources.
  - Most fruits and fruit juices.
  - Beverages such as coffee and tea.
11. Calcium is needed for bone growth and mineralization, and milk is the main source of calcium in the average American's diet. Taking into consideration that adults have achieved their maximum growth:
- One 8-ounce glass of milk (or equivalent) is recommended per week to provide needed calcium.
  - Two 8-ounce glasses of milk (or equivalent) are recommended per week to provide needed calcium.
  - One 8-ounce glass of milk (or equivalent) is recommended per day to provide needed calcium.
  - Two 8-ounce glasses of milk (or equivalent) are recommended per day to provide needed calcium.
12. The Breads and Cereals Group of the Basic Four Food Groups provides significant amounts of carbohydrate, iron, and B-vitamins in the diet. A minimum of \_\_\_\_\_ servings from this group are needed by the healthy adult each day.
- One
  - Two
  - Three
  - Four

13. Certain carbohydrate foods contain high amounts of fiber which may help the hospitalized patient with elimination problems. Which of the following foods are the best sources of fiber?
- a. Lettuce, fresh banana, fried fish, corn.
  - b. Grits, boiled squash, prunes, fresh tomato.
  - c. Apple (with skin), bran cereal, coleslaw, peanuts.
  - d. Whole wheat bread, lima beans, green peas, grapes.
14. Fats are a source of energy in the diet. Significant amounts of fat are found in:
- a. Mayonnaise, bananas, pinto beans, fried foods.
  - b. Bacon, salad dressings, margarine, mayonnaise.
  - c. Sweet potatoes, figs, margarine, salad oils.
  - d. Fried foods, butter, Irish potatoes, cream.
15. Food that would be limited on a restricted potassium diet, but might be liberalized on a restricted sodium diet:
- a. Fruit
  - b. Milk
  - c. Bread
  - d. Meat
16. The average American consumes a diet containing:
- a. 1-2 grams sodium per day.
  - b. 2-3 grams sodium per day.
  - c. 3-4 grams sodium per day.
  - d. Over 4 grams sodium per day.
17. The average healthy individual:
- a. Does not need to take a vitamin supplement if he consumes a well-balanced diet.
  - b. Would be wise to take a vitamin supplement even if he consumes a well-balanced diet.
  - c. Will need increased amounts of most vitamins with increasing age.
  - d. Will need decreased amounts of most vitamins with increasing age.



18. The primary function of Vitamin C is in:
- a. Blood coagulation.
  - b. Visual acuity.
  - c. Collagen formation.
  - d. Skin health.
19. The number of calories an individual needs to meet his/her energy needs is dependent on:
- a. Age, sex, body size, activity.
  - b. Activity, appetite, sex, age.
  - c. Body size, activity, heredity, sex.
  - d. Heredity, age, body size, appetite.
20. Sodium and potassium are both needed for:
- a. Fluid and electrolyte balance.
  - b. Transmission of nerve impulses.
  - c. Muscle contraction.
  - d. All of the above.

You are now ready to begin the slide-tape portion of the module. Approximately halfway through the slide-tape presentation, you will be asked to "STOP VISUAL AND COMPLETE WORKBOOK ACTIVITY I." At that point, you will press the "PAUSE" button on the Caramate (which will stop the slide-tape presentation), read Activity I Case Study--which is on Page 6 of the workbook, and complete the practice problems following the Case Study. NOW TURN ON THE SLIDE-TAPE PRESENTATION BY FLIPPING THE CARAMATE "AC" SWITCH UP AND INSERTING THE AUDIO-TAPE.

## ACTIVITY I

The following Case Study and practice problems deal with the material covered in the first half of the slide-tape presentation. Read the Case Study and complete the practice problems which follow.

### CASE STUDY

Mr. B., a 48 year old general surgery patient--two weeks post-op, exhibited very few signs of wound healing. For about a year prior to admission, Mr. B. had been trying unsuccessfully to lose twenty pounds from his 5'7" frame--pounds he had acquired over the past three to four years. He decided that getting rid of the extra weight while he was in the hospital would be the most painless way to lose it. He had not had much of an appetite, and he told himself that since he was getting virtually no exercise lying in bed, he probably didn't need to eat very much anyway. He decided, then, to limit himself to drinking only his coffee and juice at breakfast and eating only small amounts of salad and fruit from his normal tray at dinner and supper. He gave the remainder of the foods from his tray to the patient in the bed next to him. Mr. B.'s average daily intake averaged approximately 400 calories--calories obtained solely from carbohydrate sources with the exclusion of all protein and fat-containing foods.

Mr. B. began to "feel" thinner and was very pleased with his new weight loss, although he did notice he felt very weak and had little desire to do anything but sleep or lie in bed and watch TV. Despite the fact that the medical team had expressed concern over Mr. B.'s slow recovery, Mr. B. was certain he would be up and about in no time.

Answer the following practice problems by circling the correct answer(s).

1. Mr. B. was correct in thinking that with decreased physical activity, less calories are needed to meet energy requirements for exercise. However, the period immediately following surgery is not the time to start a strict

1. (cont.)

reduction diet, since extra calories are needed for healing. Following post-op recovery, Mr. B. could start a reduction diet for which his caloric level would be calculated taking into consideration which of the following factors?

- |                   |                          |
|-------------------|--------------------------|
| a. Heredity       | f. Sex of the individual |
| b. Meal frequency | g. Appetite              |
| c. Exercise       | h. Sodium intake         |
| d. Body size      | i. Age                   |
| e. Fluid intake   |                          |

2. Mr. B. is excluding a nutrient from his diet that is necessary for successful post-op healing. High quality sources of this nutrient include:

- |                  |                     |                |
|------------------|---------------------|----------------|
| a. Gelatin       | e. Eggs             | i. Milk        |
| b. Beef          | f. Green vegetables | j. Beans       |
| c. Cooked cereal | g. Margarine        | k. Fresh fruit |
| d. Fish          | h. Chicken          | l. Cheese      |

3. In addition to high quality protein sources, Mr. B. needs additional calories from carbohydrate and fat sources to keep ingested protein from being broken down to meet energy needs. Assuming Mr. B.'s energy needs are 2400 calories at this time, he will be losing approximately \_\_\_\_\_ pounds each week if he continues to consume only 400 calories each day.

- a. 2
- b. 4
- c. 6
- d. 8

4. If Mr. B.'s appetite is relatively low, he could still increase his caloric intake significantly by adding small amounts of a nutrient which provides a concentrated source of energy or calories. Foods that provide this nutrient include:

- |               |                   |                      |
|---------------|-------------------|----------------------|
| a. Mayonnaise | e. Banana         | i. Bread             |
| b. Potato     | f. Cereal         | j. Canned vegetables |
| c. Margarine  | g. Bacon          | k. Salad oil         |
| d. Beans      | h. Salad dressing | l. Fruit juice       |

5. Supposing Mr. B. does want to follow a sensible reduction diet following his post-op recovery. He would be best advised to:
- a. Cut out all foods containing fat, since it is the most concentrated source of energy and calories and eating even small quantities of it will lead to undesirable weight gain.
  - b. Consume a high protein diet, because high quality protein food sources are very low in calories, but very high in satiety value, so one's appetite is satisfied after eating a relatively low number of calories.
  - c. Keep carbohydrate foods such as bread and potatoes to a bare minimum, since carbohydrate, like fat, is a very concentrated source of energy and its consumption will lead to undesirable weight gain.
  - d. Eat a variety of foods containing carbohydrate, protein, and fat, but cut down on portion size--since it is the total calories consumed that determines weight gain or loss and not whether certain types of foods are eaten or avoided.

UPON COMPLETION OF THE ABOVE PRACTICE PROBLEMS, TURN THE PAGE AND CHECK YOUR ANSWERS.

## Answers to Activity I Practice Problems:

1. c, d, f, i
2. High Quality Protein Sources  
b, d, e, h, i, l
3. b  
Since Mr. B. needs 2400 calories/day to meet his energy needs and is consuming only 400 calories/day, he is adding up a deficit of 2000 calories/day or 14,000 calories/week. A deficit of 3500 calories is needed to lose one pound of body fat or lean body mass, so Mr. B. would be losing approximately four pounds of body fat and lean body mass in a one week period.
4. Fat Food Sources  
a, c, g, h, k
5. d

You are now ready for the second half of the slide-tape presentation. At the end of the slide-tape presentation, you will be asked to "STOP VISUAL AND COMPLETE WORKBOOK ACTIVITY II." At that point, you will press the "STOP" button on the Caramate (which will eject the audiotape) and flip the "AC" switch down. Next, you will complete Activity II Practice Problems which begin on Page 9 of the workbook. NOW RESTART THE SLIDE-TAPE PRESENTATION BY PRESSING THE "PAUSE" BUTTON ON THE CARAMATE.

## ACTIVITY II

The following practice problems deal with the material covered in the second half of the slide-tape presentation. Complete Activity II Practice Problems by circling the correct answer(s) or filling in the blank(s).

1. A patient with multiple decubiti would need more than the Recommended Dietary Allowance for protein, which is a range of \_\_\_\_\_ grams. This is because the R.D.A.'s are designed for good nutritional maintenance of the healthy individual, and a patient with decubiti needs extra protein to replace the protein being lost through the oozing sores.
2. The servings needed daily by the average healthy adult from each of the Basic Four Food Groups are:  
  
\_\_\_\_\_ servings Meat Group  
\_\_\_\_\_ servings Milk and Milk Products Group  
\_\_\_\_\_ servings Breads and Cereals Group  
\_\_\_\_\_ servings Fruits and Vegetables Group
3. The recommended number of servings from each of the Basic Four Food Groups provides an adequate amount of nutrients for the average healthy individual, but provides only about 1200 calories--which is an inadequate amount of calories for most adults to maintain their ideal body weight. Therefore, additional foods or larger servings from the Basic Four must be consumed to maintain \_\_\_\_\_.
4. Match the items in Column II with the items in Column I by placing the correct number in the space provided. There is only one correct response for each item in Column I.

### COLUMN I

- \_\_\_\_\_ a. Vitamin A
- \_\_\_\_\_ b. Potassium
- \_\_\_\_\_ c. Vitamin C
- \_\_\_\_\_ d. Milk
- \_\_\_\_\_ e. Meat Group

### COLUMN II

- 1. Calcium
- 2. Collagen
- 3. Iron
- 4. Skin health
- 5. Salt substitute

5. Mr. P.'s physician has advised Mr. P. to increase his dietary potassium intake. Assuming Mr. P. is on a normal diet, which of the following foods would be good choices to help him increase his potassium intake?

- |                  |                 |
|------------------|-----------------|
| a. Potato        | g. Orange juice |
| b. Beef          | h. Tomato       |
| c. Cooked cereal | i. Coke         |
| d. Banana        | j. Rice         |
| e. Raisins       | k. Milk         |
| f. Tea           | l. Hard candy   |

6. Mr. S. is a hypertensive patient and must severely restrict his sodium intake. Therefore, he will need to limit which of the following foods in his diet?

- |                  |                      |
|------------------|----------------------|
| a. Lettuce       | g. Apple             |
| b. Meat          | h. Coffee            |
| c. Tea           | i. Cheese            |
| d. Banana        | j. Canned vegetables |
| e. Regular bread | k. Orange juice      |
| f. Milk          | l. Egg               |

UPON COMPLETION OF ACTIVITY II PRACTICE PROBLEMS, TURN THE PAGE AND CHECK YOUR ANSWERS.

Answers to Activity II Practice Problems:

1. 45-65
2. 2 servings Meat Group  
2 servings Milk and Milk Products Group  
4 servings Breads and Cereals Group  
4 servings Fruits and Vegetables Group
3. body weight
4. a. 4  
b. 5  
c. 2  
d. 1  
e. 3
5. a, b, d, e, g, h, k
6. b, e, f, i, j, l

You are now ready to complete the module posttest. Please do not refer to the module pretest, practice problems, or practice problem answers while completing the posttest.

NOW TURN THE PAGE AND COMPLETE THE POSTTEST.



## POSTTEST

Circle the correct answer. There is only one correct answer for each question.

1. Certain carbohydrate foods contain high amounts of fiber which may help the hospitalized patient with elimination problems. Which of the following foods are the best sources of fiber?
  - a. Boiled squash, prunes, grits, fresh tomato.
  - b. Lima beans, grapes, green peas, whole wheat bread.
  - c. Bran cereal, peanuts, coleslaw, apple (with skin).
  - d. Fried fish, corn, lettuce, fresh banana.
2. In the healthy adult, the main function of carbohydrate in the diet is to:
  - a. Meet energy needs.
  - b. Build and replace body cells.
  - c. Transport vitamins for absorption.
  - d. Facilitate digestion of nutrients.
3. The Breads and Cereals Group of the Basic Four Food Groups provides significant amounts of carbohydrate, iron, and B-vitamins in the diet. A minimum of \_\_\_\_\_ servings from this group are needed by the healthy adult each day.
  - a. One
  - b. Two
  - c. Three
  - d. Four
4. Hypertensive patients are usually placed on low sodium diets. A diet that is highly restrictive in sodium content will also be restrictive in:
  - a. Most fruits and fruit juices.
  - b. Beverages such as coffee and tea.
  - c. Foods from animal sources.
  - d. All carbohydrate-containing foods.

5. The average American consumes a diet containing:
  - a. 1-2 grams sodium per day.
  - b. 2-3 grams sodium per day.
  - c. 3-4 grams sodium per day.
  - d. Over 4 grams sodium per day.
  
6. Fats are a source of energy in the diet. Significant amounts of fat are found in:
  - a. Figs, margarine, sweet potatoes, salad oils.
  - b. Fried foods, Irish potatoes, cream, butter.
  - c. Salad dressings, bacon, mayonnaise, margarine.
  - d. Pinto beans, fried foods, bananas, mayonnaise.
  
7. Calcium is needed for bone growth and mineralization, and milk is the main source of calcium in the average American's diet. Taking into consideration that adults have achieved their maximum growth:
  - a. One 8-ounce glass of milk (or equivalent) is recommended per day to provide needed calcium.
  - b. Two 8-ounce glasses of milk (or equivalent) are recommended per day to provide needed calcium.
  - c. One 8-ounce glass of milk (or equivalent) is recommended per week to provide needed calcium.
  - d. Two 8-ounce glasses of milk (or equivalent) are recommended per week to provide needed calcium.
  
8. The average healthy individual:
  - a. Will need increased amounts of most vitamins with increasing age.
  - b. Does not need to take a vitamin supplement if he consumes a well-balanced diet.
  - c. Will need decreased amounts of most vitamins with increasing age.
  - d. Would be wise to take a vitamin supplement even if he consumes a well-balanced diet.

9. Food that would be limited on a restricted potassium diet, but might be liberalized on a restricted sodium diet:
  - a. Fruit
  - b. Bread
  - c. Meat
  - d. Milk
10. Sodium and potassium are both needed for:
  - a. Transmission of nerve impulses.
  - b. Muscle contraction.
  - c. Fluid and electrolyte balance.
  - d. All of the above.
11. The average healthy adult needs between 1500 and 3000 calories per day to meet energy needs. The recommended number of servings from each of the food groups in the Basic Four Food Groups provides:
  - a. An adequate amount of nutrients and calories for an individual suffering from injury or disease.
  - b. An adequate amount of nutrients and calories for a very active or large individual.
  - c. An adequate amount of nutrients, but not enough calories for the average individual.
  - d. An adequate amount of nutrients, but too many calories for the average individual.
12. A well-balanced meal pattern includes a mixture of foods containing carbohydrate, protein, and fat. An adequate amount of carbohydrate and fat in the diet ensures that:
  - a. Protein won't be broken down to meet energy needs.
  - b. Foods from each of the Basic Four will be consumed.
  - c. Weight loss will be unlikely to occur.
  - d. Stored fat will be used to meet energy needs.

13. High quality protein is needed in the diet to build and replace body cells. Which of the following are sources of high quality protein?
- a. Chicken, bacon, gelatin, ham.
  - b. Fish, milk, cheese, eggs.
  - c. Milk, enriched noodles, eggs, beef.
  - d. Bran, turkey, gelatin, porkchop.
14. The number of calories an individual needs to meet his/her energy needs is dependent on:
- a. Activity, appetite, sex, age.
  - b. Heredity, age, body size, appetite.
  - c. Age, sex, body size, activity.
  - d. Body size, activity, heredity, sex.
15. The average healthy adult needs approximately \_\_\_\_\_ grams of protein each day.
- a. 25-45
  - b. 45-65
  - c. 75-95
  - d. 95-115
16. The primary function of Vitamin C is in:
- a. Skin health.
  - b. Blood coagulation.
  - c. Visual acuity.
  - d. Collagen formation.
17. The Recommended Dietary Allowances are designed for:
- a. Calculation of nutrient needs of persons suffering from disease or injury.
  - b. Maintenance of good nutrition of most healthy persons in the United States.
  - c. Calculation of reduction, diabetic, and other special diets.
  - d. Calculation of exact nutrient needs of the healthy individual in the United States.

18. An increase or a deficit of \_\_\_\_\_ calories above/below energy needs is needed to gain or lose one pound of body fat.
- a. 2000
  - b. 2500
  - c. 3000
  - d. 3500
19. Gram per gram, carbohydrate contains:
- a. About the same calories as protein.
  - b. About the same calories as fat.
  - c. More calories than both protein and fat.
  - d. About the same calories as protein and fat.
20. When an individual consumes a diet that provides more calories than he/she needs, the excess calories will be stored as fat:
- a. Unless high-fiber foods are also consumed.
  - b. Unless the diet is high in protein.
  - c. Regardless of the types of foods consumed.
  - d. Only if the diet is high in fat.

You have now completed this instructional module. Please complete the module evaluation on the following page, then turn in your workbook. If you desire a copy of the workbook and answers to the Pre- and Posttests, please indicate below, and a copy of the workbook and test answers will be provided for you following this study. Thank you very much for your participation.

I would like a copy of the module workbook and answers to the Pre- and Posttests. YES \_\_\_\_\_ NO \_\_\_\_\_

## NUTRITIONAL CARE--EVALUATION

- |  |                      |             |                   |
|--|----------------------|-------------|-------------------|
| 1. Subject matter was presented in an organized manner.                      | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 2. Module format was easy to follow.   | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 3. Subject matter was covered adequately.                                    | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 4. Subject matter presented in the module is of value to the hospital nurse. | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 5. The content of the module is applicable to my everyday work situation.    | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 6. Workbook activities contributed to my learning.                           | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 7. The audiovisual presentation maintained my interest.                      | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 8. Pacing of the audiovisual presentation was appropriate.                   | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 9. The narration was audible and easily understood.                          | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |
| 10. Visuals contributed to the presentation.                                 | STRONGLY<br>DISAGREE | 1 2 3 4 5 6 | STRONGLY<br>AGREE |

COMMENTS:

## TEST ANSWERS

### PRETEST

1. a
2. b
3. d
4. b
5. d
6. c
7. a
8. a
9. b
10. b
11. d
12. d
13. c
14. b
15. a
16. d
17. a
18. c
19. a
20. d

### POSTTEST

1. c
2. a
3. d
4. c
5. d
6. c
7. b
8. b
9. a
10. d
11. c
12. a
13. b
14. c
15. b
16. d
17. b
18. d
19. a
20. c

## MODULE REVISIONS

Questions 4 and 11 of the posttest (corresponding to questions 10 and 8 of the pretest) were revised following the pilot study to increase reliability of the testing instrument. Before revision, these two questions were:

4. Hypertensive patients are usually placed on low sodium diets. A diet that is highly restrictive in sodium content will also:
  - a. Be restrictive in most foods from the Fruit Group.
  - b. Be restrictive in all highly-spiced foods.
  - c. Be restrictive in foods from animal sources.
  - d. Be restrictive in all carbohydrate foods.
11. The average healthy adult needs between 1500 and 3000 calories per day to meet energy needs. The recommended number of servings from each of the food groups in the Basic Four Food Groups provides:
  - a. An adequate amount of calories for an individual suffering from injury or disease.
  - b. About the right amount of calories for a fairly active or large individual.
  - c. Not enough calories to meet energy needs--additional foods need to be added.
  - d. Too many calories for energy needs--most individuals would gain weight.

Workbook Practice Problem 3 (Activity II) was also revised in conjunction with question 11 on the module posttest (corresponding to question 8 of the pretest). Before revision, Practice Problem 3 (Activity II) was:

3. Since the caloric value of the recommended number of servings from each of the Basic Four Food Groups totals approximately 1200 calories, an individual following a diet of less than 1000-1200 calories/day:
  - a. Will probably lose weight quickly and keep it off.
  - b. Is probably not consuming a nutritionally-adequate diet.
  - c. Needs to eat many small meals throughout the day.
  - d. Needs to drink plenty of water to flush ketones out.



The information elicited in Workbook Practice Problems 5 and 6 (Activity II) was elicited in the form of one question in the pilot study. However, it was the recommendation of one member on the Panel of Experts establishing validity of the testing instrument that this question be divided in order to clarify and enhance understanding of the material. Before revision, Practice Problem 5 (Activity II) was:

5. Mr. C. is a cirrhotic patient who was placed on a restricted sodium diet. Mr. R. is a renal patient on hemodialysis who was placed on a restricted protein, sodium, and potassium diet. Which of the following foods would Mr. C. be allowed which would be restricted or not allowed on Mr. R.'s diet?

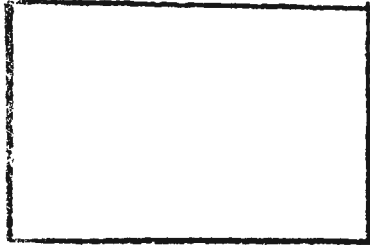
- |                  |                     |
|------------------|---------------------|
| a. Potato        | g. Salt substitute  |
| b. Bacon         | h. Orange juice     |
| c. Cooked cereal | i. Coke             |
| d. Banana        | j. Rice             |
| e. Raisins       | k. Regular crackers |
| f. Tea           | l. Mustard greens   |

APPENDIX C

MODULE STORYBOARD

STORYBOARD--NUTRITIONAL CARE  
(Narrative by Sheer Luck Holmes)

SCRIPT



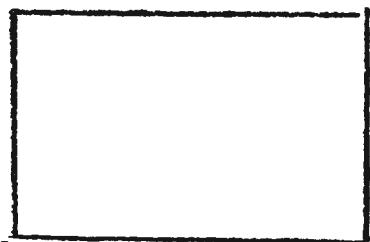
1.-4. Intro-  
ductory slides

Music.



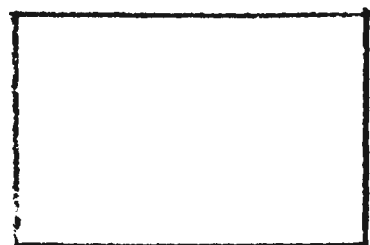
5. SLH running

(Music fades.) Pardon me ..... I say  
there! Don't walk away. I want to ask  
you a question.



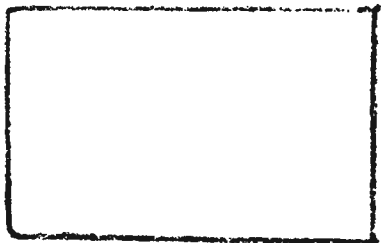
6. SLH pointing

No, I don't have the wrong person. I'm  
looking for a nurse. You're the one I  
want to talk to.



7. SLH with  
magnifying glass

Yes, I was talking about nutrition. The  
truth is, I need your help. You see, I'm  
a detective, and I have a tough case to  
crack that's going to require some work  
in the field of nutrition.



8. SLH in  
front of door--  
DIETITIAN

I've heard from reliable sources that the dietitian is the individual primarily responsible for providing nutritional care to the hospitalized patient.



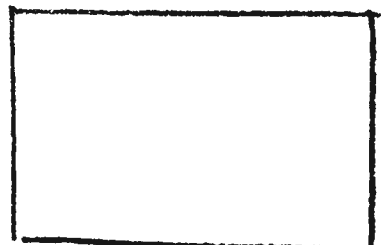
9. SLH in  
front of door--  
NURSE

I've also heard that the nurse is involved with the patient's nutritional care. I believe I'm correct in saying that due to the nurse's close involvement with the patient, patients often turn to the nurse for answers to questions dealing with nutrition and diet.



10. SLH--  
Hands on hips

I have come to the conclusion, therefore, that it is going to be important for me to have the cooperation of both Nursing and Dietetic Service in this case.



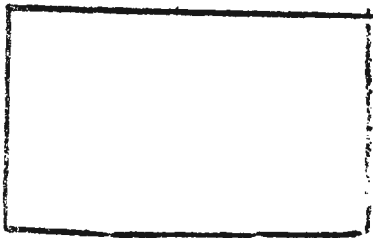
11. Imposter--  
Hands over face

Now, down to the facts. It appears that there is an unidentified male somewhere in the hospital passing out false and potentially harmful information.



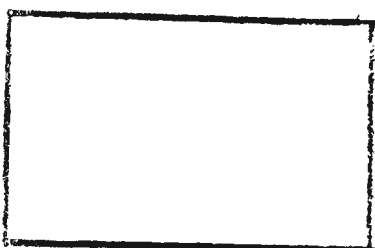
12. Imposter--  
Passing out Nutri-  
tion Information

The man is posing as a patient and seems to be roaming the hospital, striking up conversations with unsuspecting patients and passing himself off as an expert in the field of nutrition.



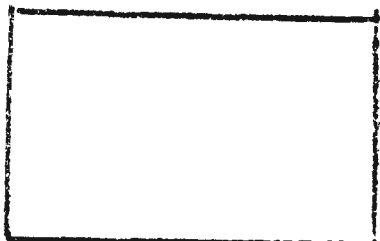
13. Imposter--  
Behind desk

This imposter has been able to convince an undetermined number of patients to date that the diets they are on are unnecessary, and that he can provide them with the "right" diet to meet their medical and nutritional needs.



14. Imposter--  
Behind desk with  
patients

The man appears to be quite an actor, as he has managed to gather a large following among the patients, and they are beginning to accept his fraudulent advice over the advice of the dietitian and other members of the health care team.



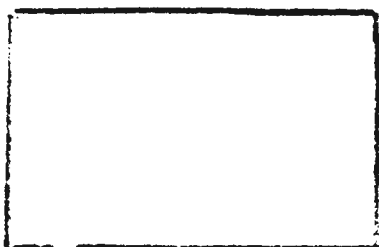
15. SLH grab-  
bing imposter

Now, it would seem that this case is very simple--identify the imposter and remove him from the premises. However, there is a little more to it than that.



16. Imposter  
with glasses

This man, along with being an excellent actor, is also a master of disguise. The patients questioned thus far who have had any dealings with him all gave different descriptions of his appearance.



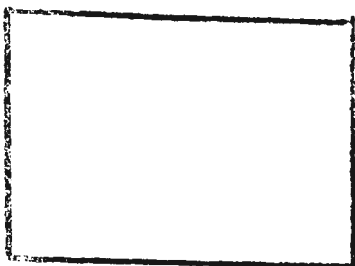
17. Double  
of imposter

This would lead one to think that more than one person is giving out the false nutritional information, which is what the man wants us to think, I do believe.



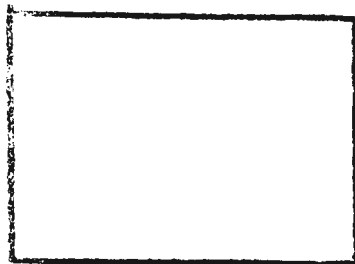
18. Imposter removing disguise

It is my opinion, (if not validated at this point), that there is only one imposter, and it is my task at this time to identify the fake and collect concrete evidence to have him apprehended.



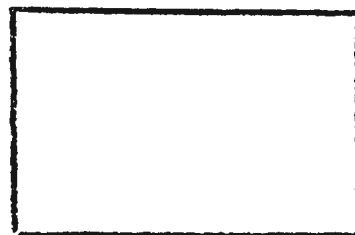
19. SLH chasing imposter with fly swatter

I will need the help of both the Dietetic and Nursing Service during this period to combat the erroneous information given out by this man. The correction of false nutritional information is vital to the well-being of each and every patient in this hospital.



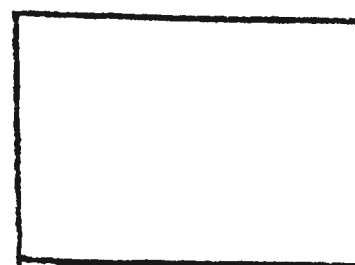
20. SLH thinking of the imposter

To give you a better picture of the situation, let me give you some examples of the kind of misinformation being passed out by this man and what information I have been giving patients in order to counteract the false information.



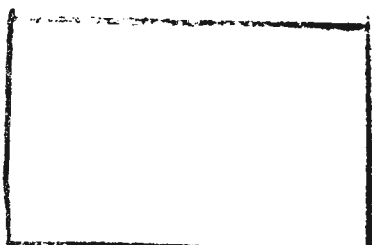
21. Imposter throwing out milk and chicken

One patient, who happened to be a burn patient, was told by the imposter that all protein-containing foods should be eliminated from his diet in order to "purify" his system and speed up recovery.



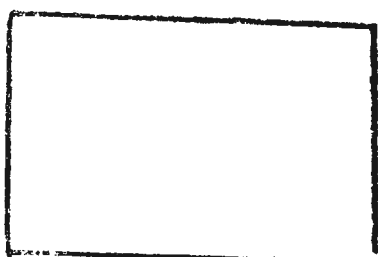
22. Imposter behind door

Now this is probably the most harmful nutritional misinformation that could have been given this patient, and I am still unsure as to why the imposter is so intent upon harming the individuals in this hospital.



23. Main  
function of  
protein

What I told this particular patient was that protein is needed in everyone's diet to build and replace body cells, and protein needs are increased, not decreased, during periods when increased building and replacement of body cells must take place.



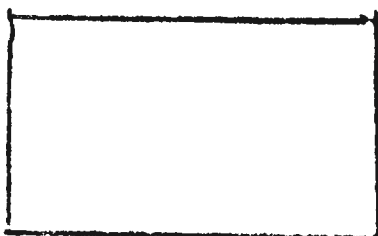
24. Times of  
increased pro-  
tein needs

These periods of increased building and cell replacement occur during the rapid growth of infancy and childhood, during pregnancy and lactation, and of major concern to this patient, during periods of recovery from injury and disease.



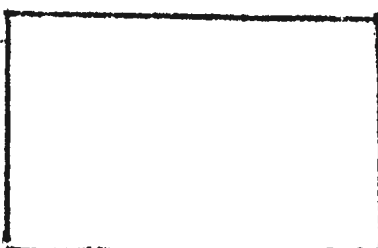
25. SLH look-  
ing at High  
Quality Protein

Now, to obtain the protein necessary for building and cell replacement, it is best to include foods that contain high quality protein. What I mean is this:



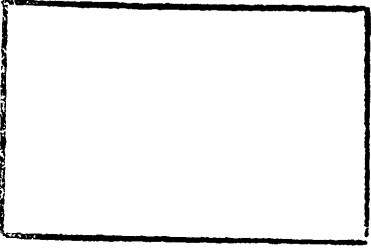
26. SLH push-  
ing amino acid  
block

Amino acids are the building blocks of protein, and different foods contain different types and different amounts of each type of amino acid.



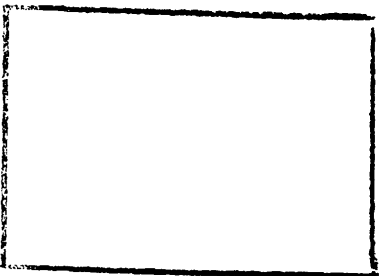
27. SLH be-  
tween Low and  
High Quality Pro

High quality protein sources contain all of the different types and right amounts of each type of amino acid necessary for cell growth and repair. In contrast, low quality protein sources do not contain all of the necessary types nor the right amounts of each type of amino acid necessary for cell growth and repair.



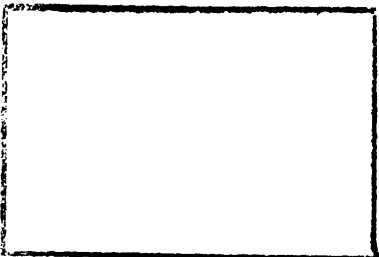
28. SLH under  
falling amino  
acid blocks

When all of the necessary amino acids are not present at the same time in foods eaten, cell growth and repair cannot take place.



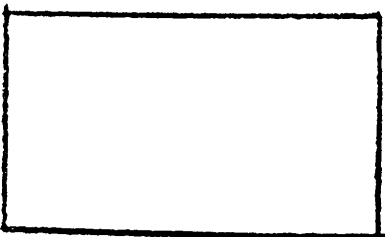
29. High  
Quality Protein  
Sources

Therefore, it is desirable to include an adequate amount of high quality protein foods. These foods include eggs, milk, cheese, meat, fish, and poultry.



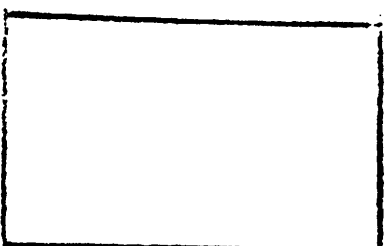
30. Low  
Quality Protein  
Sources

Low quality protein foods, or foods that contain some, but not all of the necessary amino acids, include such foods as gelatin, vegetables and legumes, breads, cereals, noodles, pasta, and other starches.



31. Picture  
of chicken,  
eggs, and  
milk

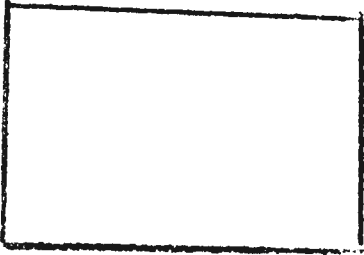
I also explained to this patient that no one should limit himself solely to the consumption of high quality protein foods. On the contrary,



32. Picture of  
carbohydrate and  
fat sources

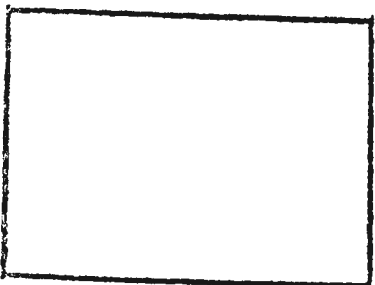
additional calories should be consumed from fat and carbohydrate food sources to ensure that energy needs are met, and at the same time, the protein ingested will not be broken down to meet energy needs, but will be spared for cell growth and repair.





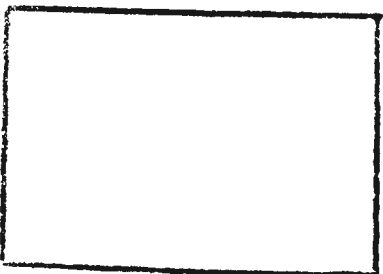
33. CHO and fat spare protein

Protein can't be utilized for growth or maintenance, nor can the breakdown of tissue protein be prevented when the diet doesn't provide satisfactory quantities of other energy sources, such as carbohydrates and fats. The energy requirement of the organism has to be satisfied first.



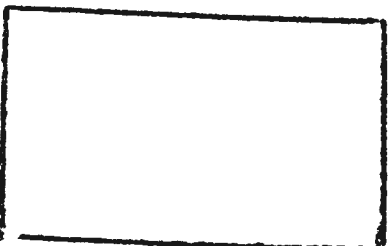
34. SLH reading diet book

My next encounter was with an obese patient who had been instructed by the nutrition imposter to follow a "low carbohydrate" diet in order to take off pounds quickly. I began with the basics for this patient.



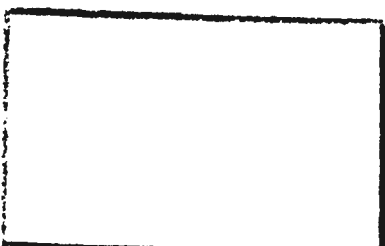
35. Energy needs

I explained to him that energy is required for all internal body processes and all an individual's physical activity. An individual's energy needs are determined primarily, therefore, by adding together the energy needed to carry on internal body processes (referred to as basal metabolism) and the energy needed for physical activity or exercise.



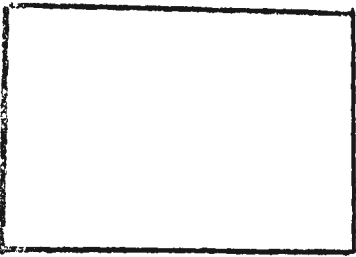
36. SLH thinking about calories

An individual obtains energy through the foods he eats. All foods contain energy value, but different foods have different amounts of energy value. This energy value is measured in number of calories.



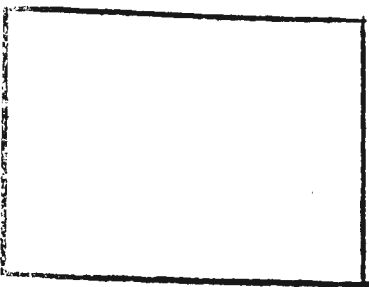
37. Storage of excess calories

When an individual consumes a diet that provides more calories than are needed for basal metabolism and exercise, the excess calories are stored as fat regardless of the types of foods consumed.



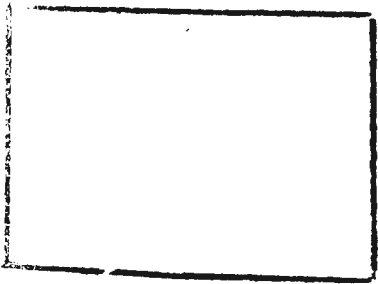
38. SLH with  
1 pound fat  
on back

An excess of 3500 calories consumed over a period of time--calories which are not needed to carry on body processes or to provide the body with energy for exercise--will lead to an increase of one pound in body fat.



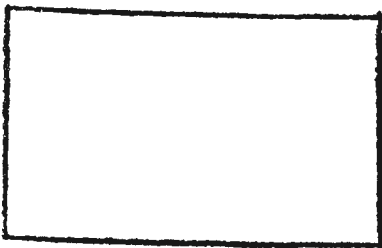
39. SLH  
throwing off  
1 pound fat

The opposite is also true. If an individual consumes less calories than are needed to carry on body processes and to provide energy for exercise, he will lose weight. A deficit of 3500 calories over a period of time will lead to a one pound loss of body fat.



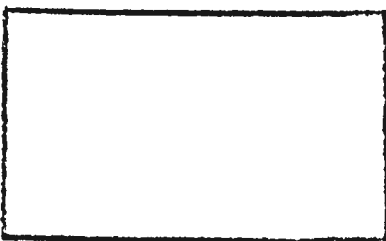
40. SLH  
totaling cal-  
ories

It is the total number of calories that one consumes, and not whether or not a particular food or group of foods is eaten or avoided that is important in weight control.



41. Factors  
affecting cal-  
oric intake

The number of calories an individual needs to meet his energy needs is dependent on body size, activity, sex, age, climate, and several other factors. So, caloric allowances must be adjusted to meet individual needs.



42. SLH with  
cane

With increasing age, fewer calories are needed to maintain one's weight. Not only does the basal metabolism rate decrease with advancing age,



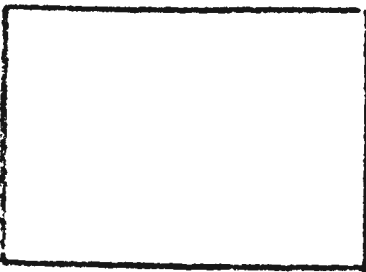
43. SLH in  
rocker

but the more active components of maintenance living are gradually decreased, the individual generally becomes more sedentary, and as a result, caloric needs are decreased.



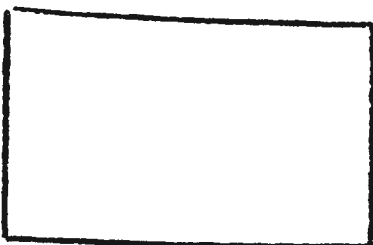
44. Composition  
of American diet

The average American consumes 40-50% of his calories as carbohydrate, 15-20% as protein, and 30-40% as fat.



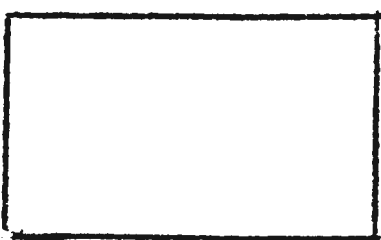
45. SLH on  
scales

An individual desiring to lose weight can best succeed by consuming a variety of foods containing carbohydrate, protein, and fat, but cutting down on the quantities eaten.



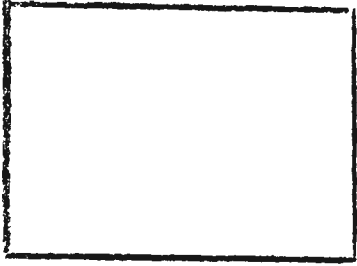
46. SLH push-  
ing fat block

Fat, since it is the most concentrated source of energy at nine calories per gram, should be limited the most when one is trying to lose weight.



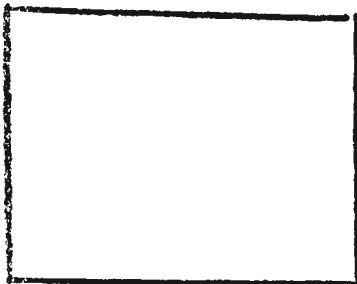
47. Food  
sources of fat

Foods containing significant amounts of fat include margarine, butter, cream and other dairy products, bacon, mayonnaise, salad oils, and salad dressings.



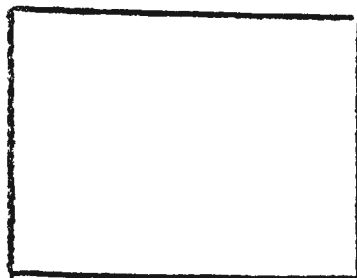
48. Protein  
and CHO on  
balance

Carbohydrate and protein, which provide the same amount of energy gram per gram at four calories per gram, are better choices than foods containing high quantities of fat when one is trying to lose weight.



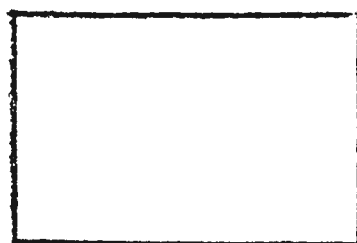
49. SLH climb-  
ing stairs

The main function of carbohydrate in the diet of the healthy adult is to provide energy. A minimum amount of carbohydrate should be consumed each day to prevent ketosis, excessive protein breakdown, and other undesirable metabolic responses.



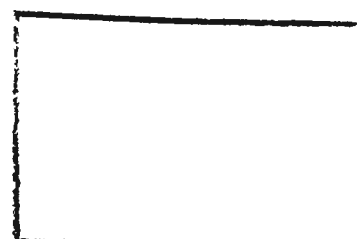
50. SLH throw-  
ing out diet  
book

(I emphasized this particular point to the patient I was conversing with in order to dispel any inkling he might still have to follow a low carbohydrate diet.)



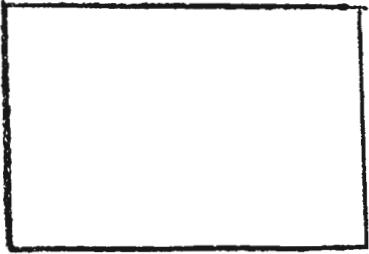
51. CHO food  
sources

I went on to tell him that carbohydrates are chiefly found in fruits and vegetables, breads, cereals, other starches, and milk.



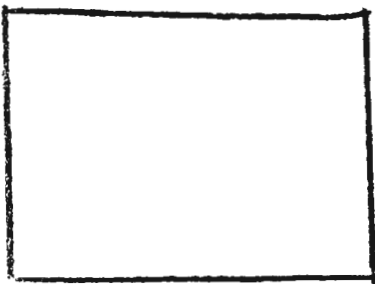
52. SLH hold-  
ing glass of  
milk

Milk, as mentioned earlier, also contains high quality protein, and does contain a significant amount of fat if it is whole milk and not lowfat or skim milk.



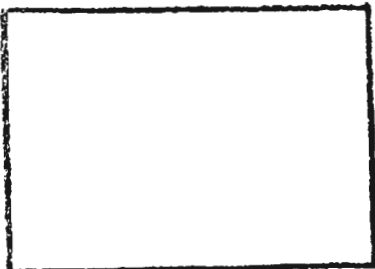
53. SLH driving food through I.T. via fiber

Along with the function of carbohydrate in providing energy, I also mentioned that certain carbohydrate foods contain significant amounts of fiber, a substance which provides bulk to facilitate the faster movement of food through the intestinal tract. Patients having problems with constipation may benefit by an increased amount of fiber in their diets.



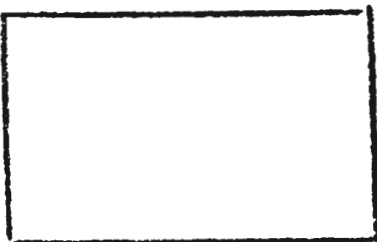
54. Fiber sources

Foods containing significant amounts of fiber include fresh fruits and vegetables, fruit and vegetable skins, whole grain breads and cereals, bran, seeds, and nuts.



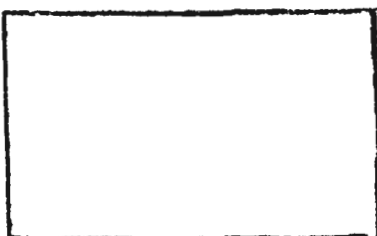
55. Instruction to Stop Visual

(Student will turn off visual and complete Workbook Activity I.)



56. Pill bottles

The next patient, who was the last patient I had an opportunity to speak with in depth, was concerned about getting enough nutrients from his food to stay healthy, and had been advised by our nutrition imposter to take huge quantities of vitamin and mineral supplements in order to achieve good health.



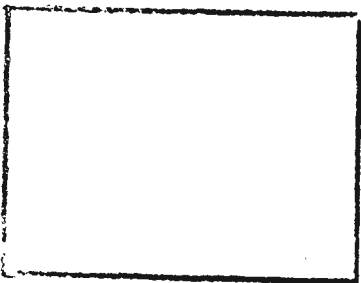
57. SLH with magnifying glass

First off, I explained to this patient that the vitamins and minerals necessary for metabolism and discharge of important body functions are needed in only minute amounts by the healthy individual, and these small amounts can usually be obtained by eating a well-balanced diet providing a variety of foods.



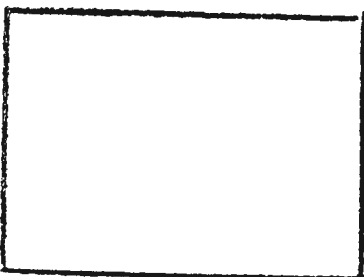
58. SLH pouring out pills

I told him that the need for excessive amounts of vitamins and minerals was uncommon, and there was no need for him to be taking huge supplements without the advice of his physician.



59. Group of people standing

I then referred him to the Recommended Dietary Allowances for protein, calories, and major vitamins and minerals. I explained to him that the differences in the nutritional needs of individuals and the variations in nutritive values of foods made it impossible to design a food plan just right for everyone.



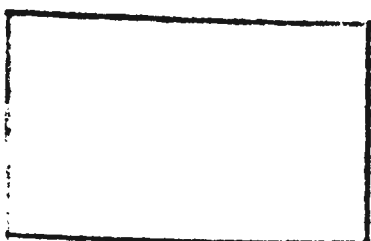
60. Purpose of R.D.A.'s

However, the R.D.A.'s are designed for the maintenance of good nutrition of most healthy persons in the United States and would cover individual variations among most people. I further explained that many healthy people need more than the R.D.A. for some nutrients and some need less; and, that none of the recommendations apply to persons suffering from disease, metabolic disorder, or injury.



61. SLH multiplying in head

The R.D.A.'s can be used, though, as a basis for calculating increased nutrient needs of individuals in various states of disease and injury.



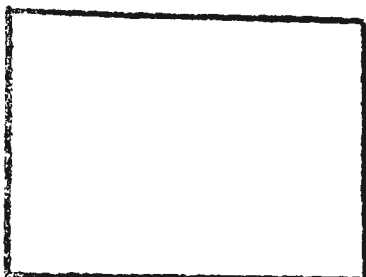
62. SLH reading Basic Four Food Guide

Next, I told him that in order to make sure he got all the vitamins, minerals, and other nutrients he would need daily, a simple food guide was available called the Basic Four Food Guide.



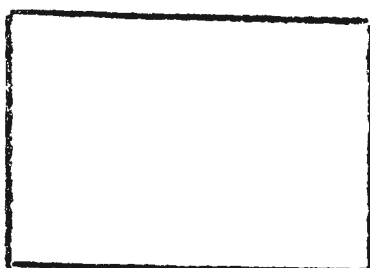
63. SLH reaching for milk

When a healthy individual consumes the recommended servings from each of the Basic Four Food Groups daily, he can be relatively sure that he is consuming a nutritious, balanced food plan and is getting the right amounts of nutrients necessary to maintain good health.



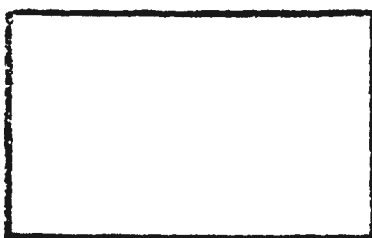
64. List of Basic Four Food Groups

The Basic Four Food Groups consist of: The Meat Group, the Milk and Milk Products Group, the Breads and Cereals Group, and the Fruits and Vegetables Group.



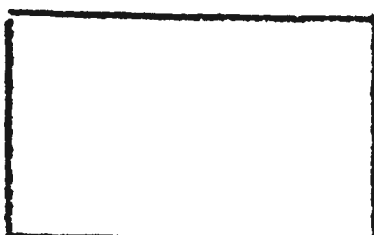
65. List of Meat Group

Beginning with the Meat Group, I told him that the foods included in this group provide high quality protein. Foods in the Meat Group include: Meat, fish, poultry, and eggs. Nuts, beans, peas, lentils, and peanut butter can be used occasionally in place of the other foods.



66. Daily protein intake

Contrary to the eating habits of most Americans, it is not necessary to consume huge amounts of foods from the Meat Group in order to obtain an adequate amount of protein. The average healthy adult needs only 45-65 grams of protein each day.

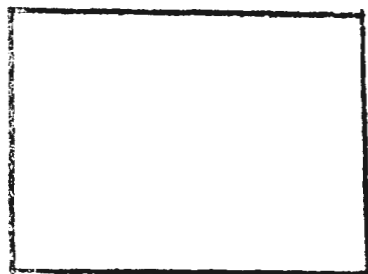


67. SLH holding meat servings

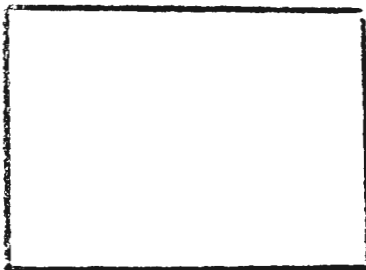
Two servings of two to three ounce portions of meat, fish, or poultry, in combination with the other foods recommended in the Basic Four Food Guide, will provide enough protein to meet the daily needs of the average healthy adult.



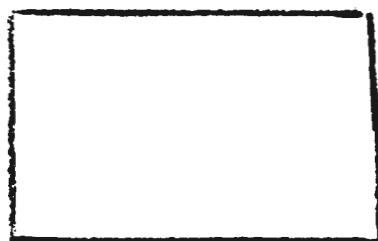
68. SLH holding barbells of Iron and B-Vitamins



69. Foods in Milk Group



70. SLH throwing milk over shoulder



71. SLH mopping up spilled milk



72. SLH in arm sling and cast

The Meat Group also supplies iron--needed in the body to synthesize hemoglobin and various enzymes--and B-Vitamins, which are needed for the metabolism of carbohydrate, protein, and fat.

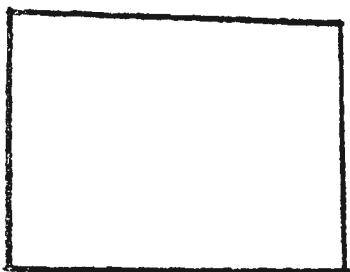
The next group of the Basic Four, the Milk and Milk Products Group, includes milk in all forms--whether it be whole, skim, evaporated, or dry milk--plus yogurt, cheese, ice cream, and cottage cheese.

Many people believe that this group is totally unnecessary once adulthood is reached. However, this belief is false.

The Milk and Milk Products Group provides the major source of calcium in the average American's diet, and elimination of foods in this group from the diet will usually severely limit an individual's calcium intake.

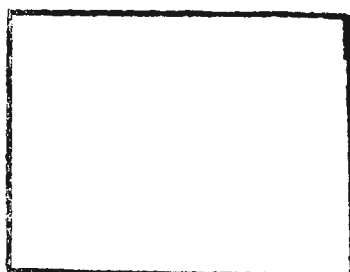
Calcium is a mineral needed to give hardness to bones and teeth. When an individual consumes only a limited amount of calcium over a period of time, bones may grow thin and weak, break easily, and heal slowly.





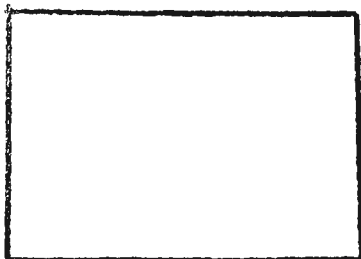
73. SLH with balloons

The Milk and Milk Products Group also contributes high quality protein to the diet, riboflavin--a B-vitamin needed in metabolism, Vitamin D--needed for the utilization of calcium, and Vitamin A.



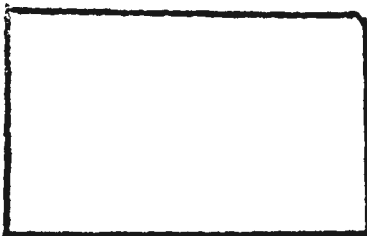
74. Quantity of milk each day

An adult needs to consume two 8-ounce glasses of milk each day or its equivalent in other foods from this group in order to get an adequate amount of calcium.



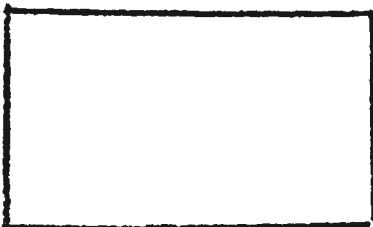
75. Foods from Breads and Cereals Group

The third group of the Basic Four, the Breads and Cereals Group, besides containing bread and cereal, also contains rice, pasta, noodles, pancakes, rolls, and other flour products.



76. SLH juggling

This group contains high amounts of carbohydrate needed for energy, iron, B-vitamins, and low quality protein. At least four servings from the Breads and Cereals Group are needed daily by the healthy adult.



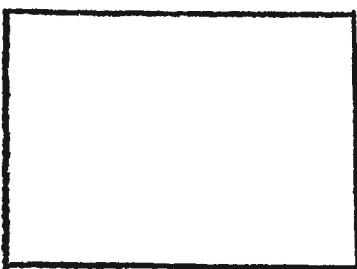
77. SLH thinking about bread and feeling fat

Many people, as was the case with the obese patient mentioned earlier, try to severely limit foods from this group when dieting because they believe that carbohydrate foods are fattening. This is a mistake, since these foods contain needed vitamins, minerals, and carbohydrate.



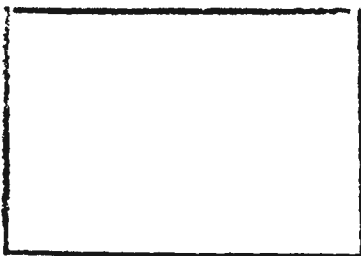
78. Picture of bread and chicken

The truth of the matter is: One slice of bread contains no more calories than a one-ounce portion of lean meat.



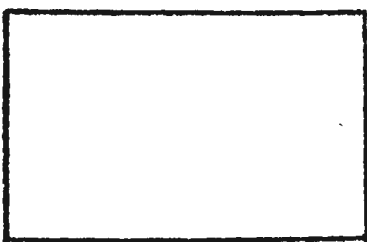
79. Servings needed from Fruits and Vegetables Group

The final group, the Fruits and Vegetables Group, provides many needed vitamins and minerals, along with carbohydrate and small amounts of low quality protein. Four servings from this group are needed daily by the healthy adult.



80. SLH playing volleyball

Two vitamins in particular--Vitamins A and C--are important in this group.



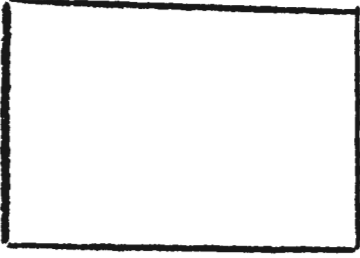
81. SLH circling dates on calendar

One serving of a good Vitamin A source should be included in an individual's diet at least every other day.



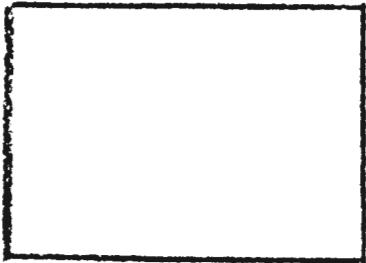
82. Vitamin A functions

Vitamin A is needed primarily for maintenance of normal vision in dim light, health of skin and mucous membranes, and normal skeletal and tooth development.



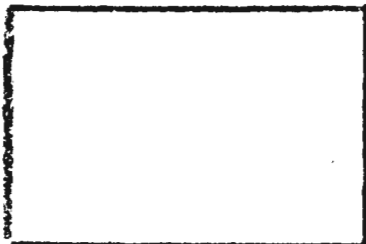
83. SLH with  
Vitamin A sources

It is found in dark green, leafy vegetables such as spinach and greens, and dark yellow or orange fruits and vegetables such as apricots, pumpkin, cantaloupe, carrots, squash, and sweet potatoes.



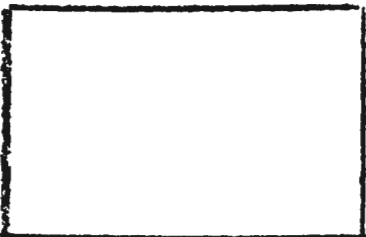
84. SLH circling  
dates on calendar

One serving of a good source of Vitamin C is needed daily by the adult.



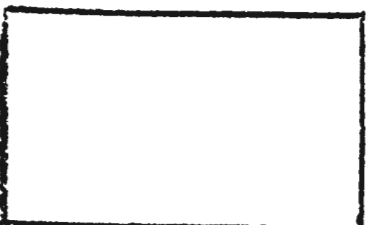
85. Vitamin C  
and Collagen

Vitamin C is needed primarily in the formation of collagen--a substance necessary in wound healing and the withstanding of the stresses of injury and infection.



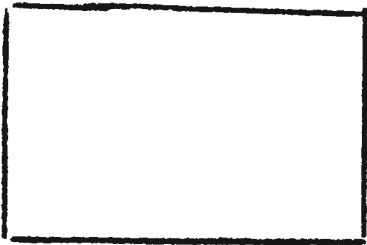
86. SLH drink-  
ing orange  
juice

The best sources of Vitamin C are found in citrus fruits. Other good sources of Vitamin C include berries, melons, tomatoes, cabbage, green pepper, and potatoes.



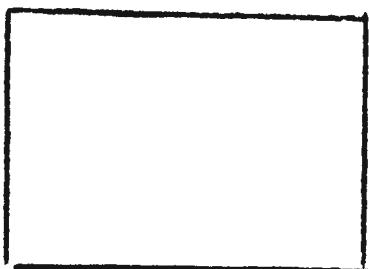
87. SLH look-  
ing at fatter  
image in mirror

A question asked of me by the patient at this point was: "If I eat all the servings recommended from each of the Four Food Groups, won't I gain weight?" My reply to him was a simple, "No." If an individual limited his intake to only the recommended number of servings from each of the Four Food Groups,



88. Recommended servings from Basic Four

which would be: Two servings meat, two servings milk, four servings breads and cereals, and four servings fruits and vegetables,



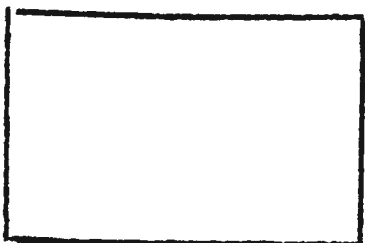
89. SLH looking at skinny image in mirror

he would actually be consuming only about 1200 calories--which would result in weight loss and not weight gain by the average individual.



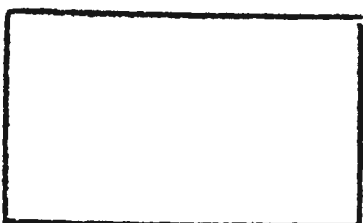
90. Small and large individual

You see, the average healthy individual needs anywhere from 1500-3000 calories to maintain body weight, depending on factors mentioned earlier. Therefore, if the recommended servings from the Basic Four provide only 1200 calories,



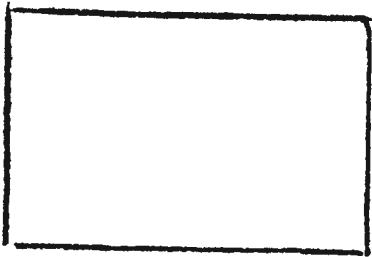
91. SLH reaching for more food

additional calories must be consumed to maintain weight. These calories may come from eating larger amounts of any of the foods in the basic diet, or by adding fats, sweets, desserts, and other foods.



92. Na and K functions

Two nutrients which I also mentioned to this patient, and which may be areas of concern to many other patients, are sodium and potassium. Sodium and potassium are both needed by the healthy individual to maintain fluid and electrolyte balance, normal irritability of nerve cells, contraction of muscles, and permeability of cell membranes.



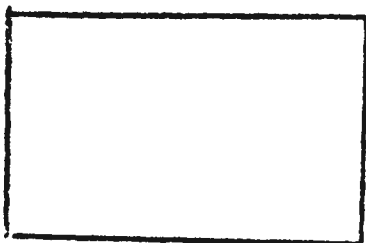
93. SLH reaching for salt

The major dietary source of sodium is regular table salt or sodium chloride. The average American consumes 7-15 grams of salt each day. Adding to this the sodium naturally found in foods,



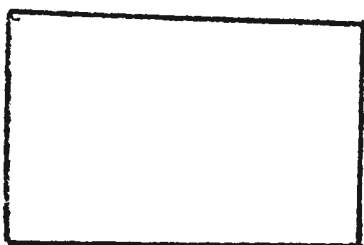
94. Average Na intake

most individuals consume well over four grams of sodium each day--an amount in excess of normal needs. Sodium is found naturally in many foods, and when foods are processed, additional sodium is often added.



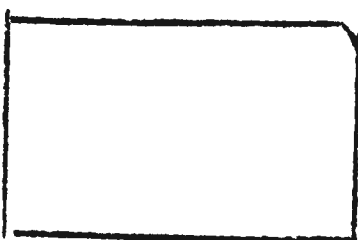
95. Picture of pig and bacon

Animal products such as meats, fish, poultry, eggs, milk, and other dairy products are natural sodium sources. When these foods are processed into such things as cold cuts, canned meats, ham, bacon, and buttermilk, the sodium value is very high.



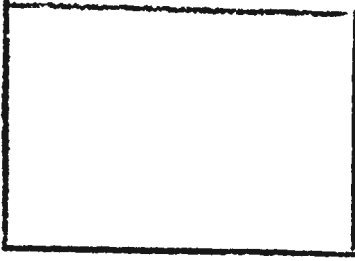
96. Picture of vegetables

Sodium is also found naturally in vegetables, and again, sodium is added in processing. So, fresh vegetables, and even most frozen vegetables, contain less sodium than those that are canned.



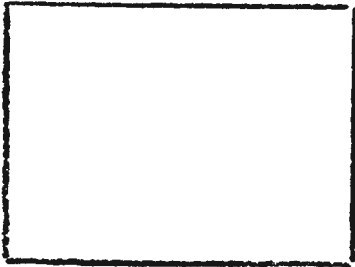
97. Picture of bread and cereal

Breads, cereals, and baked products have sodium added in preparation, and in addition, the sodium-containing compounds, baking soda and baking powder, are usually present.



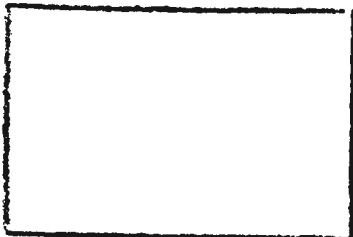
98. Potassium sources

Potassium is another mineral found in a wide variety of foods. Many foods that are good sources of sodium are also good sources of potassium--such as meat, fish, poultry, eggs, and milk.



99. Picture of vegetables

Certain vegetables contain good amounts of potassium. Some of these are: Carrots, potatoes, celery, tomatoes, and greens--with potatoes being particularly high in potassium.



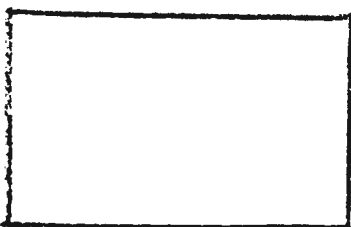
100. Picture of fruits

And, there is still another group of foods which are very low in sodium, but very high in potassium--fruits. Fruits are rich sources of potassium, with dried fruits, bananas, and orange juice being particularly good sources.



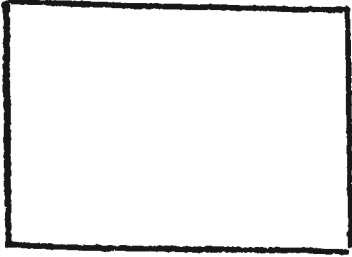
101. SLH holding salt substitute

Finally, if an individual is using salt substitute or potassium chloride in place of salt, his potassium intake is going to be very much increased.



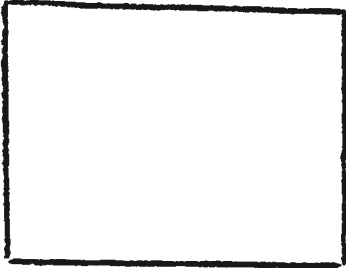
102. SLH chasing imposter with fly swatter

This brings me to the end of my conversations with the victimized patients. I will now relinquish my duty of correcting false information given out by the nutrition imposter to Dietetic and Nursing Services and get busy on identifying and apprehending this fake before any more damage can be done.



103. SLH grab-  
bing imposter

I am confident that it will be merely a matter of hours before the identity of the imposter is revealed to me and he is stopped from committing anymore of his dastardly deeds.



104. Instruction  
to Stop Visual

(Student will turn off visual and complete Workbook Activity II.)

APPENDIX D  
PANEL OF EXPERTS



## PANEL OF EXPERTS

Martha Kidd, R.D.  
Dietitian  
Veterans Administration Hospital  
Houston, Texas

Yee Lew, R.D.  
Dietitian  
Veterans Administration Hospital  
Houston, Texas

Florence Tsai, R.D.  
Dietitian  
Veterans Administration Hospital  
Houston, Texas

APPENDIX E

CRITERIA FOR EXPERT EVALUATION  
OF MODULE

## CRITERIA FOR EXPERT EVALUATION

NAME \_\_\_\_\_

Please answer the following questions:

- |   |           |          |
|---|-----------|----------|
| 1. Subject matter is presented in an organized manner.                    | YES _____ | NO _____ |
| 2. Information presented in the module is accurate.                       | YES _____ | NO _____ |
| 3. Subject matter is covered adequately.                                  | YES _____ | NO _____ |
| 4. Module format is easy to follow.                                       | YES _____ | NO _____ |
| 5. Pacing of the audiovisual presentation is appropriate.                 | YES _____ | NO _____ |
| 6. The narration is audible and easily understood.                        | YES _____ | NO _____ |
| 7. Visuals contribute to the presentation.                                | YES _____ | NO _____ |
| 8. Workbook activities reinforce material covered in the module.          | YES _____ | NO _____ |
| 9. Material asked in test questions is adequately covered in the module.  | YES _____ | NO _____ |
| 10. Test questions are an adequate measure of module learning objectives. | YES _____ | NO _____ |

ADDITIONAL COMMENTS:

**APPENDIX F**  
**SUBJECT QUESTIONNAIRE**

This questionnaire is being administered for the purpose of selecting registered nurses to participate in the testing and evaluation of an in-service instructional module on nutrition designed for the hospital staff nurse. The module should aid the nurse in applying nutrition knowledge to handle basic dietary questions and problems posed by the hospitalized patient.

The module will consist of a pretest on principles of nutrition and the application of these principles, a slide-tape presentation viewed on a Caramate and accompanied by a workbook, a posttest, and an evaluation of the instruction. The time required to complete the module and evaluation is approximately one hour and fifteen minutes, which will be scheduled by Nursing Service during the nurse's regular working hours in the months of August and September.

Nurses will be selected to participate in this study on the basis of the service in which they work, age, experience, and educational background. All information elicited from this questionnaire and obtained from the testing and evaluation of the instructional module will be kept confidential and is to be used only for the purpose of this study. Participation is optional, and the nurse has the right to drop out of the study at any time.

Your participation and cooperation will be greatly appreciated. For any questions pertaining to this study, please contact Marilyn Neely (Dietetic Service) at extension 3722.

1. I would be willing to participate in this study. YES\_\_ NO\_\_
2. Signature: \_\_\_\_\_
3. Name (please print): \_\_\_\_\_
4. Service: \_\_\_\_\_
5. Usual Work Schedule:
  - a. 7:30 a.m.--4:00 p.m.
  - b. 3:30 p.m.--12:00 a.m.
  - c. 12:00 a.m.--8:00 a.m.
6. Age:
  - a. 22-35 years
  - b. 36-50 years
  - c. 51-65 years
7. Years of Experience as a Registered Hospital Staff Nurse: \_\_

8. Educational Background:
- a. Diploma Program Graduate
  - b. Baccalaureate Graduate
  - c. Associate Program Graduate
  - d. Other

9. Year of Registration: \_\_\_\_\_

**APPENDIX G**  
**CONSENT FORM**

CONSENT TO ACT AS A SUBJECT FOR RESEARCH AND INVESTIGATION

I hereby authorize Marilyn Neely to perform the following procedures: Administration of an instructional module on nutrition designed for the hospital staff nurse consisting of a twenty-question objective pretest on principles of nutrition and their application, a slide-tape presentation on nutrition accompanied by a workbook, a twenty-question objective posttest covering the material presented, and a ten-question written evaluation of the module.

The procedure in Paragraph 1 has been explained to me by Marilyn Neely. I understand that the procedure described in Paragraph 1 involves no foreseeable risks to me; confidentiality of test scores will be closely guarded.

I understand that the procedure described in Paragraph 1 has the following potential benefits to myself and/or others: I will personally benefit through an increase in nutrition knowledge and ability to apply this knowledge. The hospitalized patient will, in turn, benefit through an increased ability on my part to handle his/her basic nutrition-related problems and questions, which will thus improve the nutritional care provided for the patient, and ultimately upgrade the total health care of the hospitalized patient.

An offer to answer all of my questions regarding the study has been made. I understand that I may terminate my participation in the study at any time.

\_\_\_\_\_  
 Subject's signature

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Investigator's signature

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Witness's signature

\_\_\_\_\_  
 Date



## APPENDIX H

### APPROVAL OF HUMAN RESEARCH COMMITTEES

TEXAS WOMAN'S UNIVERSITY

HOUSTON CAMPUS

HUMAN RESEARCH REVIEW COMMITTEE REPORT


STUDENT'S NAME Marilyn Neely

PROPOSAL TITLE Effectiveness of an Instructional Module on Basic Principles  
of Nutrition Designed for the Hospital Staff Nurse

REMARKS:

DATE:

8/7/78

  
Disapprove

Approve

  
Disapprove

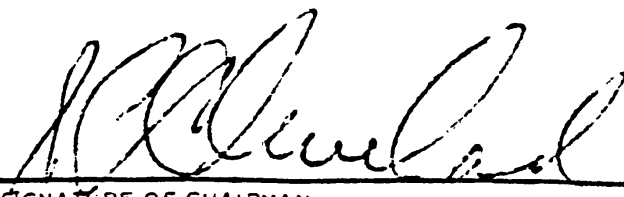
Approve

  
Disapprove

Approve

Disapprove

Approve

<b>REPORT OF SUBCOMMITTEE ON HUMAN STUDIES</b>		<b>PROJECT OR PROGRAM TITLE</b> Development of An Instructional Module on Basic Principles of Nutrition & Their Application Designed for the Hospital Staff Nurse	<b>NUMBER</b>
<b>PRINCIPAL INVESTIGATOR'S NAME</b> Marilyn Neely, Dietetic Intern		<b>VA FACILITY</b> VAH Houston, Texas	
<b>INSTITUTION OF SUBCOMMITTEE (or the equivalent body)</b> VA Hospital, Houston, Texas			<b>DATE OF REVIEW</b> July 14, 1978
This subcommittee has reviewed the above described project with respect to the rights and safety of the human subjects. The following are our findings:			
<b>1. RISKS (Check one)</b>			
<input checked="" type="checkbox"/> The planned research involves little foreseeable risk and the subjects safety is adequately protected unless the plan is modified.			
<input type="checkbox"/> The foreseeable risk is justified by the potential benefit to the subjects or by the anticipated benefit to society and the plans include adequate and appropriate measures to reduce the risk insofar as feasible.			
<input type="checkbox"/> The risk is justified but further measures seem advisable to protect the subject, including _____			
<input type="checkbox"/> The risk seems greater than can be justified by the research as planned and the project or program is not approved as presented.			
<b>2. INFORMATION FOR THE SUBJECT (Check one)</b>			
<input checked="" type="checkbox"/> The information to be given the subjects (or their legal representatives) is complete and accurate enough for them to reach a valid decision concerning participation in the research.			
<input type="checkbox"/> The information for the subjects as presented is incomplete or defective in that _____			
<b>3. CONSENT METHOD (Check one)</b>			
<input checked="" type="checkbox"/> The format and manner of obtaining informed consent from the subjects (or their legal representatives) is satisfactory.			
<input type="checkbox"/> The method of obtaining informed consent is defective in that _____			
<b>4. FURTHER COMMENTS</b>			
<b>5. RECOMMENDATION (Check one)</b>			<b>SIGNATURE OF CHAIRMAN</b>  <b>S. E. CLEVELAND, Ph. D.</b> Acting Chairman, VA Human Studies Subcommittee
<input checked="" type="checkbox"/> The project or program be approved as submitted.			
<input type="checkbox"/> The plan or protocol be revised in keeping with our comments and resubmitted.			
<input type="checkbox"/> The proposal as described be rejected.			

## APPENDIX I

### AGENCY PERMISSION FOR CONDUCTING STUDY

**COLLEGE OF NUTRITION, TEXTILES, AND HUMAN DEVELOPMENT**

1130 M.D. ANDERSON BLVD.  
HOUSTON, TEXAS 77030

AGENCY PERMISSION FOR CONDUCTING STUDY

**The Houston Veterans Administration Hospital**

grants to Marilyn Neely

a student enrolled in the Department of Nutrition and Food Science at Texas Woman's University, the privilege of its facilities in order to study the following problem:

# Effectiveness of an Instructional Module on Basic Principles of Nutrition Designed for the Hospital Staff Nurse

The conditions mutually agreed upon are as follows: (to be completed by the Agency Representative)

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (unwilling) to allow the completed report to be circulated through interlibrary loan.
5. Other

**Date:** August 7, 1978

**Signature of Agency Representative**

**Signature of Student**

**Signature of Research Committee Chair-  
man, TWU Faculty Member**

**Number of forms required: one completed original and three duplicated copies (with signatures).**

**Distribution:** one copy each to student (original); Agency, Dean of Graduate School - (to accompany prospectus); Dept. of NGS, TWU-Houston Center.

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