

THE EFFECTIVENESS OF THE MODIFIED
"DIABETIC TEACHING TOOL" IN
GROUP INSTRUCTION

by

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ABSTRACT

AN EXPERIMENTAL STUDY TO DETERMINE THE EFFECTIVENESS OF THE MODIFIED "DIABETIC TEACHING TOOL" IN GROUP INSTRUCTION

This experimental study was designed to determine if the modified "Diabetic Teaching Tool" was an effective tool for use in group instruction. The "Diabetic Teaching Tool" was developed for individual instruction and tested in an earlier study by Skelton. This study was conducted, over a four-month period, at a large urban hospital during the regularly scheduled diabetic class. All patients who attended and who met the criteria of the study were asked to participate. A total of twenty-four subjects agreed to participate and their written consent was obtained. The first twelve subjects were assigned to the control group and received group instruction by means of the diabetic teaching program of the institution. The remaining twelve subjects were assigned to the experimental group and received group instruction by means of the modified "Diabetic Teaching Tool".

Each patient was given a test of diabetic learning before commencement of the instruction and again two to seven days after completion of the instruction. A profile sheet was completed at the time of the administration of the posttest.

The two groups of subjects were found to be highly similar when compared on the demographic and diabetic characteristics obtained from the profile sheet. The t-test was used to analyze the test results. No statistically significant difference between the two groups was found. Then the Pearson product-moment correlation

coefficient was used to compare the test results and selected demographic and diabetic characteristics. The selected characteristics were age at testing, education, age at onset of diabetes, reason for current admission to hospital or visit to the doctor and the length of time since diagnosed. No significant relationship was found between the test results and these characteristics for the control group. The only characteristic to be significantly related to test results for the experimental subjects was the length of time since diagnosed.

The final comparison was between the experimental subjects of this study and those of the study conducted by Skelton. The two groups of subjects were highly similar when compared on the demographic and diabetic characteristics. The mean score obtained on the subtests of the test of diabetic learning was similar for both groups.

The study concludes with suggested implications, recommendations for changes in the test of diabetic learning and recommendations for further research.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	viii
ACKNOWLEDGMENTS.....	xi
Chapter	
I INTRODUCTION TO THE STUDY.....	1
INTRODUCTION.....	1
THE PROBLEM.....	2
Statement of the Problem.....	2
Significance of the Problem.....	2
SPECIFICS OF THE STUDY.....	5
Hypotheses.....	5
Variables.....	6
Assumptions of the Study.....	6
Limitations of the Study.....	6
Definition of Terms.....	7
II REVIEW OF THE LITERATURE.....	9
GROUP INSTRUCTION AS A TEACHING METHOD FOR PATIENTS.....	9
THE TEACHING FUNCTION OF THE NURSE.....	13
THE IMPORTANCE OF PATIENT TEACHING IN THE MANAGEMENT OF SELF-CARE IN DIABETICS.....	17
SUMMARY.....	21
III METHODOLOGY.....	22
INTRODUCTION.....	22
THE SETTING.....	22

Chapter	Page
CRITERIA FOR SUBJECT SELECTION.....	23
THE TOOL.....	23
THE PROCEDURE.....	25
DATA ANALYSIS.....	27
SUMMARY.....	27
IV ANALYSIS OF THE DATA.....	28
INTRODUCTION.....	28
DEMOGRAPHIC AND DIABETIC CHARACTERISTICS OF THE STUDY.....	29
Age.....	29
Sex.....	30
Marital Status.....	31
Education.....	32
Reason for Current Admission to Hospital or Visit to Doctor.....	32
Age at Onset of Diabetes.....	33
Length of Time Since Diagnosed.....	34
Type of Control of Condition.....	35
Sources of Information.....	36
A COMPARISON OF DIFFERENCES IN PRETEST AND POSTTEST SCORES ON THE TEST OF DIABETIC LEARNING.....	38
CORRELATIONS BETWEEN DIFFERENCES IN TOTAL PER- CENTAGE SCORES ON PRETEST AND POSTTEST OF DIABETIC LEARNING AND SELECTED DEMOGRAPHIC AND DIABETIC CHARACTERISTICS OF SUBJECTS.....	50
A COMPARISON OF THE SCORES OF SUBJECTS USING THE MODIFIED "DIABETIC TEACHING TOOL" IN GROUP INSTRUCTION AND THE SCORES OF SUBJECTS USING THE "DIABETIC TEACHING TOOL" IN INDIVIDUAL INSTRUCTION.....	57

Chapter	Page
V SUMMARY, DISCUSSION OF THE FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS.....	60
SUMMARY.....	60
DISCUSSION OF THE FINDINGS.....	61
CONCLUSIONS.....	65
IMPLICATIONS.....	66
RECOMMENDATIONS.....	66
BIBLIOGRAPHY.....	68
APPENDIXES.....	72
A. Consent Forms.....	72
B. Record of Diabetic Teaching.....	74
C. Patient Profile Sheet.....	76
D. Material Pertaining to the Scores Obtained.....	79
E. Test of Diabetic Learning.....	86
F. Modified Diabetic Teaching Tool.....	100
G. Outline of Diabetic Teaching Program.....	200

LIST OF TABLES

Table		Page
I	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY AGE.....	30
II	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY SEX.....	31
III	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY MARITAL STATUS.....	31
IV	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY EDUCATION.....	32
V	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY REASON FOR CURRENT ADMISSION TO HOSPITAL OR VISIT TO DOCTOR.....	33
VI	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY AGE AT ONSET OF DIABETES.....	34
VII	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY LENGTH OF TIME SINCE DIAGNOSED.....	35
VIII	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY TYPE OF CONTROL OF CONDITION.....	35
IX	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY SOURCES OF INFORMATION WHICH THEY HAVE USED.....	37
X	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST OF DIABETIC LEARNING.....	39
XI	A COMPARISON OF CONTROL AND EXPERIMENTAL INSULIN-USERS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON KNOWLEDGE TEST.....	40
XII	A COMPARISON OF CONTROL AND EXPERIMENTAL PILL-USERS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON KNOWLEDGE TEST.....	41
XIII	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON DIET-PLANNING SKILL TEST.....	42

Table		
XIV	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON URINE-TESTING SKILL TEST.....	44
XV	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON INSULIN-INJECTING SKILL TEST.....	45
XVI	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON KNOWLEDGE AND SKILL TESTS OF DIET-PLANNING.....	46
XVII	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON KNOWLEDGE AND SKILL TESTS OF URINE-TESTING.....	47
XVIII	A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY DIFFERENCE IN PRETEST AND POSTTEST SCORES ON INSULIN KNOWLEDGE AND SKILL TESTS.....	48
XIX	THE CORRELATION BETWEEN AGE AT TESTING AND DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST OF DIABETIC LEARNING.....	51
XX	THE CORRELATION BETWEEN EDUCATION AND DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST OF DIABETIC LEARNING.....	52
XXI	THE CORRELATION BETWEEN AGE AT ONSET OF DIABETES AND DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST OF DIABETIC LEARNING.....	54
XXII	THE CORRELATION BETWEEN LENGTH OF TIME SINCE DIAGNOSED AND DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST OF DIABETIC LEARNING.....	55
XXIII	A COMPARISON BETWEEN REASON FOR CURRENT ADMISSION TO HOSPITAL OR VISIT TO DOCTOR AND DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST OF DIABETIC LEARNING.....	56
XXIV	A COMPARISON OF THE MEAN SUBTEST SCORES OBTAINED BY SUBJECTS TAUGHT BY INDIVIDUAL INSTRUCTION AND SUBJECTS TAUGHT BY GROUP INSTRUCTION.....	59

Table		Page
XXV	SCORES OBTAINED BY CONTROL AND EXPERIMENTAL INSULIN-USERS ON KNOWLEDGE TEST.....	80
XXVI	SCORES OBTAINED BY CONTROL AND EXPERIMENTAL PILL-USERS ON KNOWLEDGE TEST.....	81
XXVII	SCORES OBTAINED BY CONTROL AND EXPERIMENTAL SUBJECTS ON DIET-PLANNING SKILL TEST.....	82
XXVIII	SCORES OBTAINED BY CONTROL AND EXPERIMENTAL SUBJECTS ON URINE-TESTING SKILL TEST.....	83
XXIX	SCORES OBTAINED BY CONTROL AND EXPERIMENTAL INSULIN-USERS ON INSULIN INJECTING SKILL TEST...	84

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CHAPTER I

INTRODUCTION TO THE STUDY

INTRODUCTION

The teaching of patients is now considered to be an important part of the nurse's function. The complexities of health care today and the necessity for patients to be able to function independently over long periods of time require an educational function in nursing.¹ Teaching, as a nursing function, can contribute to the promotion and maintenance of health and to the prevention of disease. This teaching consists of instruction to the patient and his family in the management of his condition.

The need for teaching patients with diabetes mellitus² is well documented. Thorough instruction to the patient and his family is essential to good management of diabetes. This instruction should consider the management of diabetes under the conditions of the patient's home life, his work and his other activities.³

The increasing incidence of diabetes in Canada necessitates the teaching of large numbers of people. Teaching groups of people

¹Barbara K. Redman, "Patient Education as a Function of Nursing Practice," Nursing Clinics of North America, VI, No. 4 (December, 1971), 573.

²Hereafter, the word "diabetes" will refer to diabetes mellitus.

³"Teaching Diabetic Self-Care," The New England Journal of Medicine, CCLXXVI (January, 1967), 182.

with common concerns instead of attempting to reach each individual is indicated. The need for economy of time and resources results in many nurses choosing the group method for their teaching. The concern of this study, then, is whether a "Diabetic Teaching Tool"⁴ designed for and found to be effective in individual instruction can be effectively modified for use in group instruction.

THE PROBLEM

Statement of the Problem

Is the modified "Diabetic Teaching Tool" an effective tool for use in group instruction?

Significance of the Problem

The existence of diabetes has been known for centuries but a treatment for it was not known until 1922.⁵ It is more prevalent today than ever before and available statistics indicate that the incidence of the disease, though not accurately known, is steadily increasing.⁶ It has been estimated that there are approximately 200,000 known diabetics in Canada and probably an equal number who have not yet been diagnosed.⁷

⁴Judith M. Skelton, "An Experimental Study to Determine the Effectiveness of a Diabetic Teaching Tool" (unpublished Master's thesis, University of British Columbia, 1973).

⁵John W. Caldwell, Understand Your Diabetes (Toronto: Oxford University Press, 1949), p. xii.

⁶Garfield G. Duncan, Diabetes Mellitus: Principles and Treatment (3d ed.; Philadelphia: W.B.Saunders Co., 1951), p. 106.

⁷John A. Hunt (ed.), Diabetes: A Manual for Canadians (5th ed.; Toronto: The Canadian Diabetic Association, 1973), p. 7.

Most diabetics are, however, able to live normal and productive lives. This viewpoint is evident in much of the literature in such statements as:

Given the benefits of modern treatment, the diabetic can live a normal life in virtually every respect. He can work, play, even be a parent. He can do almost everything the non-diabetic can do. But first, he must learn to live with his disease.⁸

Diabetes mellitus can be successfully managed, and the opportunities for a full life in every respect are potentially as great as for those who do not have diabetes. This satisfactory outcome can be achieved most easily if the different aspects of the management of diabetes are woven into the normal daily routine,.....⁹

These statements also suggest that the diabetic requires instruction about his condition if he is to manage it successfully.

It is a responsibility of the health professional to make this instruction available. Skelton stated, "... , the onus on health professionals to make a comprehensive job of health teaching is ... profound."¹⁰ The nurse, as a health professional, has begun to assume some responsibility for patient teaching. Krysan asked, "How are nurses to meet the increasing demand for the extensive teaching that diabetics require?"¹¹

The development of a "Diabetic Teaching Tool" by Skelton was one response to this demand for teaching. This tool was designed

⁸Henry Dolger and Bernard Seeman, How to Live with Diabetes (3d ed.; New York: W.W. Norton and Co., 1972), p. 13.

⁹Hunt (ed.), Diabetes, p. 62.

¹⁰Skelton, "Effectiveness of a Diabetic Teaching Tool," p. 2.

¹¹Germaine S. Krysan, "How do We Teach Four Million Diabetics?" American Journal of Nursing, LXV, No. 11 (November, 1965), 105.

for planned individual teaching to help the diabetic gain the knowledge and skills required for self-care. "The effectiveness of this type of instruction was tested by comparing the self-care knowledge and skills of two groups of adult diabetics, one of which received the normal teaching of the institution, and the other planned instruction by means of the tool."¹² There were twenty subjects in each group. They were compared on a number of demographic and diabetic traits. Knowledge and skill test results of both groups were also compared.

"Diabetic patients taught by means of the "Diabetic Teaching Tool" demonstrated a significantly higher level of learning about self-care than did patients taught in the unplanned manner"¹³ This appeared to be true regardless of the duration of their diabetes, age at time of teaching and testing, previous education, and age at onset of diabetes. However, these factors were significantly related to the level of learning of patients receiving unplanned instruction.

It is recognized that individual patient instruction has many advantages. An important one is that it can be at the individual's level and pace. All content is directly related to the individual so that he does not have to sort out which facts apply to him. However, it also has some disadvantages. It takes a considerable amount of time and some patients still receive only a minimum

¹²Skelton, "The Effectiveness of a Diabetic Teaching Tool," 40.

¹³Ibid., p. 89.

amount of instruction.¹⁴ Valentine stated:

Ideally, individual patient instruction has been preferred, but with the tremendous number of ... patients in clinics today and with the limited number of professional people to render this teaching service, a more economical, yet adequate, method of teaching had to be found.¹⁵

The method to which she referred was group instruction.

What are the advantages of group instruction? Mezzanotte stated:

Group instruction incorporates such advantages as more adequate instruction for more patients, a definite time and place for the instruction, a consistent presentation of the instructions and designation of one nurse to give the instruction. Moreover, it offers the patient the potentially therapeutic value of participation in a group.¹⁶

Like the individual instruction, group instruction has disadvantages. It does not consider individual differences in learners or in manifestation of diseases. In fact, individual concerns are frequently overlooked. The possibility of the group being controlled by one or more individuals is always a risk. However, nurses with knowledge of group process and prepared in group teaching techniques can overcome many of these problems.

SPECIFICS OF THE STUDY

Hypotheses

The hypotheses of this study were:

1. there is no significant difference in the learning about

¹⁴Elizabeth Jane Mezzanotte, "Group Instruction in Preparation for Surgery," American Journal of Nursing, LXX, No.1 (January, 1970), 89.

¹⁵Lois R. Valentine, "Self-Care Through Group Learning," American Journal of Nursing, LXX, No. 10 (October, 1970), 2140.

¹⁶Mezzanotte, "Group Instruction," 89.

self care of subjects receiving group instruction by means of the modified "Diabetic Teaching Tool" as compared to subjects receiving group instruction by means of the diabetic teaching program;

2. there is no significant difference in the scores on the test of diabetic learning of subjects receiving group instruction by means of the modified "Diabetic Teaching Tool" as compared to subjects receiving individual instruction by means of the "Diabetic Teaching Tool."

Variables

The independent variables in this study were:

1. the modified "Diabetic Teaching Tool";
2. the diabetic teaching program currently provided by the institution.

The dependent variable was the patient's learning about self-care as measured by a knowledge and skill test.

Assumptions of the Study

This study was based on two assumptions:

1. that diabetic patients require special learning to manage their self-care at home;¹⁷
2. that nurses have a role in the teaching of diabetic patients.¹⁸

Limitations of the Study

The limitations of this study were:

¹⁷ Skelton, "The Effectiveness of a Diabetic Teaching Tool," 7.

¹⁸ Ibid.

1. the small sample size;
2. the variability in the two groups of subjects.

Definition of Terms

Diabetic patient: "refers to any patient who has a primary or secondary diagnosis of diabetes mellitus."¹⁹

Diabetic Teaching Tool: refers to a teaching aid developed by Skelton. It consisted of an easel binder which contained posters and nurses' instructions dealing with eleven major content areas of diabetic learning and a carrying case which contained patient take-home folders, content corresponding to that presented in the easel binder, kardex slips, lists of diabetic supplies, consent forms, meal-planning booklets and urine testing kits.²⁰

Modified "Diabetic Teaching Tool": refers to a modification of the teaching aid developed by Skelton. The posters were substituted by slides and minor deletions and additions were made to the nurses' instructions to facilitate use of the tool in group instruction. No changes were made in the content. Each patient received a folder containing lesson material corresponding to that presented by the nurse, a meal-planning booklet and a urine testing kit. This tool is contained in Appendix F of this study.

Diabetic teaching program: refers to that program currently

¹⁹Skelton, "The Effectiveness of a Diabetic Teaching Tool," 8.

²⁰Judith M. Skelton, "A Diabetic Teaching Tool," Canadian Nurse, LXIX, No. 4 (December, 1973), 36.

offered at a large urban hospital. The outline of the program is contained in Appendix G of this study.

Group instruction: refers to teaching which is planned and presented in an informal setting to a group of two to eight patients.

Self-care: "refers to the knowledge and skills which a diabetic person must have to manage his condition effectively on a day-to-day basis."²¹

Patient Learning: refers to the difference in the scores obtained on the knowledge and skill pretest and posttest.

²¹Skelton, "The Effectiveness of a Diabetic Teaching Tool," 8.

CHAPTER II

REVIEW OF THE LITERATURE

There is an abundance of literature on the teaching of diabetic patients but only a limited amount is concerned with the use of group instruction. However, there are articles and studies dealing with group instruction for patients with other conditions. These were utilized in the preparation of this study.

The literature review is presented under the following headings: group instruction as a teaching method for patients; the teaching function of the nurse; and the importance of patient teaching in the management of self-care in diabetics.

GROUP INSTRUCTION AS A TEACHING METHOD FOR PATIENTS

Group instruction has been utilized in the teaching of patients with a variety of conditions. It has been widely used for teaching prenatal care and to a lesser extent for instructing pre-operative patients. It is becoming a more popular method for teaching patients with long term conditions such as rheumatoid arthritis, chronic respiratory conditions and diabetes.

Nickerson studied forty-one diabetic patients of whom fifteen received group instruction, fifteen received individual instruction, and eleven were controls.¹ The purpose of this study

¹Donna Nickerson, "Teaching the Hospitalized Diabetic," American Journal of Nursing, LXXII, No. 5 (May, 1972), 937-938.

was to determine if diabetics receiving group instruction would demonstrate as much or more knowledge of diabetes and skill in urine testing as diabetics receiving individual instruction. The same questionnaire and check list were used for the pretest and posttest for the three groups. The results were: a gain of 0.73 points by the control group, a gain of 12.4 points by the patients who received individual instruction and a gain of 16.5 points by patients who received group instruction. In continuing with the group instruction to thirty-six people Nickerson found, "better results and in less time than it took to instruct fifteen individually."²

These findings were supported by Bowen et al.³ They investigated fifty-one patients to determine if improvement in patient well-being could be demonstrated in a group of diabetic patients having a planned program of instruction. The control group consisted of twenty-eight patients and the experimental group consisted of twenty-three patients who were comparable in age, educational level and duration of disease. The control group received an initial assessment on five specified indices, no instruction and a reassessment on the same five indices. The experimental group received the same assessments but between the two received five instructional sessions. The results showed the experimental group to have made a significantly greater gain in knowledge about their disease and skill in carrying out their treatment than the control group made. There

²Ibid., p. 938.

³Rhoda G. Bowen, Rosemary Rich, and Rozella M. Schlotfeldt. "Effects of Organized Instruction for Patients with the Diagnosis of Diabetes Mellitus," Nursing Research, No. 3 (Summer, 1961), 151-157.

was no significant difference between the two groups in relation to attitudes or clinical manifestation of well-being.⁴

The results of this study suggest that group teaching is effective in improving the patient's knowledge about his condition and his self-care skills but that this does not necessarily ensure a higher level of well-being.

Group teaching has been utilized with the presurgical patient with some success. Lindeman studied the effect of individual and group pre-operative teaching on a number of variables in 351 pre-surgical patients.⁵ The results showed group instruction to be as effective as individual teaching for deep breathing, coughing and bed exercises as measured by postoperative ventilatory function, length of hospital stay, and number of analgesics given postoperatively.⁶ Group teaching was more efficient than individual teaching as measured by the mean length of time required for patients to learn the bed exercises. The mean length of learning time for subjects who received group instruction was 1.8 minutes and for those receiving individual instruction it was 4.1 minutes.⁷ In addition, it was more efficient in terms of total time spent in teaching.

Mezzanotte also studied the use of group instruction in

⁴Ibid., p. 156.

⁵Carol A. Lindeman, "Nursing Intervention with the Pre-surgical Patient," Nursing Research, XXI, No. 3 (May-June, 1972), 196.

⁶Ibid., p. 206.

⁷Ibid., p. 208.

presurgical patients but did not use a comparison group.⁸ She studied twenty-four patients having elective abdominal surgery. Instructions were given for thirty minutes to six groups of patients, averaging four patients per group. The planned instruction included four major areas of information:⁹

1. general instruction in preparation for surgery;
2. hospital policies concerning surgical patients;
3. suggestions about the control of pain; and
4. activity that would promote satisfactory recovery.

The patients were interviewed by the investigator, five to seven days after surgery, using a printed guide to evaluate the instruction. All patients agreed that the group instruction had been beneficial. Preference for group instruction was indicated by twenty out of twenty-four subjects when they were asked to state a preference for group or individual instruction. The investigator recognized that the study was too limited to permit definite conclusions but she felt that it supported the idea that a group technique would be an effective method for instructing patients preoperatively.¹⁰

Several nurses have written articles in support of group instruction but do not statistically support their claims. Robinson and Filkins report on the experiences of nurses with group teaching

⁸Elizabeth Jane Mezzanotte, "Group Instruction in Preparation for Surgery," American Journal of Nursing, LXX, No. 1 (January, 1970), 89-91.

⁹Ibid., p. 90.

¹⁰Ibid., p. 91.

in an outpatient department.¹¹ These classes are organized so that there is utilization of patient waiting time. They measure their success by the increased patient participation and by the comments from the participants such as the one in response to a diabetic foot care clinic, "'If I'd had this lesson on diabetic foot care ten years ago, I might still have my leg.'"¹² This does not necessarily indicate that group instruction is superior to other forms of instruction but it does indicate that it is a valid and useful teaching strategy.

THE TEACHING FUNCTION OF THE NURSE

"The basic purpose of nursing is the promotion of health; teaching is one of the nurse's activities that contributes to the attainment of that aim."¹³ A study by Pohl, of the teaching activities of the nurse practitioner, revealed that there is both confusion concerning the nurse's teaching role and lack of preparation for the role.¹⁴ However, it indicated that the majority of nurses feel that teaching is a nursing responsibility. One of the conclusions drawn from the study was a definition of the teaching function of the nursing practitioner. It reads:

¹¹Geraldine Robinson and Marilyn Filkins, "Group Teaching with Outpatients," American Journal of Nursing, LXIV, No. 11 (November, 1964), 110-112.

¹²Ibid., p. 111.

¹³Margaret L. Pohl, The Teaching Function of the Nursing Practitioner (2d.ed.; Dubuque, Iowa: Wm. C. Brown Co., Publishers, 1973), p. 1.

¹⁴Margaret L. Pohl, "Teaching Activities of the Nurse Practitioner," Nursing Research, XIV, No. 1 (Winter, 1965), 4-11.

The teaching function of the nursing practitioner consists of a system of actions, intended to induce learning, which provides activities, materials, and guidance in informal situations; it includes both the activities of communication and the activities of structured teaching; it is directed toward assisting the learner to achieve his potential¹⁵

In response to the question of how the nurse can carry out the function of teaching among such divergent groups of people as patients and in so many settings Pohl stated that there is one similarity which has great significance:

All these learners are human beings and the basic processes of learning are the same for everyone, regardless of individual differences or variations in the teaching-learning situation.¹⁶

In spite of its acceptance as a useful tool in the practice of nursing, teaching of patients has been performed irregularly.¹⁷ One of the things to which Redman attributes this problem is the confusion about the teaching roles of various health team members. She stated that, "a clearer delineation of goals and the division of labor would likely yield more effective care."¹⁸ She emphasized that nursing must take some initiative in this situation.

Palm conducted a descriptive survey to determine whether nurses give top priority to patient teaching over other aspects

¹⁵Ibid., p. 11.

¹⁶Pohl, "Teaching Function of the Nursing Practitioner," p. 4.

¹⁷Barbara K. Redman, The Process of Patient Teaching in Nursing (2d ed.; Saint Louis: The C.V.Mosby Co., 1972), p. 14.

¹⁸Ibid., p. 15.

of care when presented with written descriptions of patients with learning needs in nonemergency situations of direct nursing care.¹⁹ Fifty-nine percent of 151 medical-surgical nurses assigned top priority to teaching but tended to stress explanations of immediate care rather than preparation for discharge and self-care at home. The survey also revealed that the nurses tended to teach in response to expressed learning needs by patients which may indicate that they have difficulty with identifying these needs and are reluctant to initiate patient teaching if their own assessment is the only basis for the decision.²⁰

One of the reasons suggested for the reluctance to initiate patient teaching is the lack of knowledge concerning specific conditions. Etzwiler administered a thirty-five item multiple choice test on general knowledge of diabetes to 289 graduating senior nursing students.²¹ The survey revealed a significant lack of information concerning basic concepts of diabetes as well as knowledge of fundamental nursing procedures related to the disease.²²

Patient teaching is more than the giving of information in response to a question, as was pointed out in Pohl's definition of

¹⁹Mary Lock Palm, "Recognizing Opportunities for Informal Patient Teaching," The Nursing Clinics of North America, VI, No. 4 (December, 1971), 672-678.

²⁰Ibid., p. 676.

²¹Donnell D. Etzwiler, "Who's Teaching the Diabetic?" Diabetes, XVI, No. 2 (February, 1967), 111-116.

²²Ibid., p. 116.

the teaching function of the nurse practitioner. It includes planning the content, methods, techniques and devices that are to be used and a means of evaluating whether learning has occurred.²³

The nurse has a number of teaching methods from which to choose in the process of executing her teaching function. Monteiro stated, "The teaching can be very informal teaching done incidentally at the patient's bedside or, at the other end of the continuum, can be formal and highly structured, as teaching done in the structured formal lectures of a diabetic teaching unit."²⁴ Palm showed a preference for informal teaching. She stated, "Informal teaching at the bedside has been identified as the most effective, opportune, and important teaching."²⁵ However, more recent research has provided information which suggests that this is not necessarily true in all instances. Redman expressed the need for evidence concerning the effectiveness of patient teaching in a variety of circumstances. She wrote, "Much instruction given by nurses is done on a one-to-one basis in situations where the benefits of group instruction... might be considerable."²⁶

²³May Hornback, "Diabetes Mellitus - The Nurse's Role," Nursing Clinics of North America, V, No. 1 (March, 1970), 10.

²⁴Lois A. Monteiro, "Notes on Patient Teaching - A Neglected Area," Nursing Forum, III, No. 1 (Winter, 1964), 26.

²⁵Palm, "Informal Patient Teaching," 678.

²⁶Barbara K. Redman, "Patient Education as a Function of Nursing Practice," Nursing Clinics of North America, VI, No. 4 (December, 1971), 579.

THE IMPORTANCE OF PATIENT TEACHING IN THE
MANAGEMENT OF SELF-CARE IN DIABETICS

The education of the patient and his family, about his condition, is generally accepted as one of the most important aspects of the treatment of diabetes.²⁷ Hamwi outlined some reasons for its importance.

The more information the individual with diabetes mellitus has about his disease, the greater the possibility that optimum control will be achieved, and the incidence of acute complications will be markedly reduced. There is suggestive evidence that there would also be an associated decrease in the incidence of chronic complications. In addition to these compelling medical reasons, the educated patient is far more self-sufficient and adaptable to all environmental stresses, and in general will require fewer hospitalizations than the less informed.²⁸

Allan suggests that education of the diabetic may be the means of saving his life.²⁹ Dolger and Seeman supported these views. They stated:

The diabetic should know everything that can be known about his ailment, its history, nature, how it develops, the problems it creates, how it is treated. He should be able to distinguish medical fact from popular fancy, prejudice from sound practice. Knowing these things, he will be better able to cope with his disease every day of his life.³⁰

²⁷George J. Hamwi, "Special Announcement: Treatment of Diabetes," Journal of the American Medical Association, CLXXXI (September 22, 1962), 1064.

²⁸Ibid.

²⁹Frank N. Allan, "Education of the Diabetic Patient," The New England Journal of Medicine, CCLXVIII No. 2 (January 10, 1963), 94.

³⁰Henry Dolger and Bernard Seeman, How to Live with Diabetes (3d ed.; New York: W.W. Norton and Co. Inc., 1972), p. 13.

While many agree with Hamwi that, "the optimum time for the education of the patient in relation to a chronic disease, such as diabetes, is when it is originally diagnosed,"³¹ they tend to stress the need for continuity of education. Duncan stated, "Change is inevitable. The understanding and the management of diabetes are no exception."³² Thus, the initial education is really an introduction to a lifelong process. Allan also gave support to this idea when he stated:

Adequate education of the patient at the beginning of treatment can give him a start in the right direction and protect him from pitfalls. Nevertheless, it is important for the physician to see him at regular intervals to review and supplement his instruction. The well informed and well supervised patient is best assured of the maintenance of good health and a long life.³³

Etzwiler, in compiling his list of aspects that should be taught to all patients and their families, included, "the importance of continuing care and education."³⁴

A study by Stone in 1961 offered support to those who believed in the importance of patient education. He studied 160 patients with diabetes and found 126 patients to be poorly regulated. A number of factors were found to contribute to this including

³¹Hamwi, "Announcement," 1064.

³²Garfield G. Duncan, A Modern Pilgrim's Progress with Further Revelations for Diabetics (2nd ed.; Philadelphia: W. B. Saunders Co., 1967) p. ix.

³³Allan, "Education," 95.

³⁴Donnell D. Etzwiler, "Patient Education," Diabetes Mellitus: Diagnosis and Treatment, eds. Stefan S. Fajans and Karl E. Sussman, Vol. III (New York: American Diabetes Assoc., Inc., 1971)p.186.

failure to adhere to diet, "because they did not know enough about it."³⁵ Fifty-one of the 126 poorly controlled patients responded to the appropriate instructions and treatment by achieving good control.³⁶

Watkins et al studied sixty clinic patients to determine the relationship between what people know, what they do and their state of diabetic control.³⁷ They found that those who knew more about diabetes managed better when rated on management of insulin, urine tests, diet and foot care. However, in rating disease control they found those who knew more to be in poorer control.

This negative correlation between knowledge and control was also reported by Williams and Martin in, "The Clinical Picture of Diabetic Control, Studied in Four Settings."³⁸ Of 213 patients studied, 29 percent were in acceptable control and 71 percent in less than adequate control. However, other factors were found to be related to poor control such as early age at onset, large household size and presence of major social problems. Stone also identified emotional problems and refusal of the patient to attempt to regulate

³⁵Daniel B. Stone, "A Study of the Incidence and Causes of Poor Control in Patients with Diabetes Mellitus," The American Journal of the Medical Sciences, CCXLI (April, 1961), 441.

³⁶Ibid.

³⁷Julia D. Watkins et al, "A Study of Diabetic Patients at Home," American Journal of Public Health, LVII, No. 3 (March, 1967), 452.

³⁸T. Franklin Williams and Dan A. Martin, "The Clinical Picture of Diabetic Control, Studied in Four Settings," Diabetes, XIV, No. 7 (July, 1965), 469.

the illness as contributing factors.³⁹

In view of these and other findings Skelton stated:

Whether or not there is a positive relationship between knowledge about diabetes and clinical control of the disease is still a matter of debate. Whatever the ultimate truth of this discussion, knowledge appears to be relevant to effective management of self-care at home.⁴⁰

What is the significance of this information to patient teaching?

Skelton stated, "The problem, then, becomes less one of 'should we teach?' and more one of 'how can we better our teaching?'"⁴¹

³⁹Stone, "Incidence and Cause of Poor Control," 441.

⁴⁰Skelton, "Effectiveness of a Diabetic Teaching Tool," 13.

⁴¹Ibid., p. 4.

SUMMARY

The literature review revealed an increase in the use of group instruction as a teaching method. Research involving comparison of group instruction and individual instruction has indicated that group instruction is as effective as individual instruction in some instances and more effective in others. Research in which no comparison was made indicated that group instruction is an effective means of patient teaching. However, we must be mindful of the other factors which influence learning, such as interest and expertise of the teacher, number of people in the group and readiness of the learner.

There is an acceptance of teaching as a function of the nurse. However, it is a function that is not well performed. A number of reasons for this inadequate performance were identified.

There was much support for the belief that patient teaching is an important factor in the management of self-care in diabetics. Unfortunately, the literature review revealed that good management does not always lead to good control. Age at onset, household size and the presence of emotional and social problems were felt to be contributing factors to lack of good control.

CHAPTER III

METHODOLOGY

INTRODUCTION

This study was conducted to determine if the modified "Diabetic Teaching Tool" is an effective tool for use in group instruction. The tool was originally designed by Skelton for use in individual instruction. No changes were made in the content of the tool but some modifications were required in the format of presentation. The instruction was given in four and one-half hours. This involved one-half hour of instruction on Monday and one hour of instruction on each of the days Tuesday through Friday. The effectiveness of the modified tool was determined by comparing the learning about self-care by two groups of diabetics, one of which received planned group instruction by means of the institution's diabetic teaching program, and the other received planned group instruction by means of the modified "Diabetic Teaching Tool." All subjects were pretested and posttested by the researcher. No attempt was made to control other variables which are likely to influence the effectiveness of any teaching program. It was hoped that these variables would be similar for both groups of subjects.

THE SETTING

The subjects were chosen from inpatients and outpatients who attended the diabetic classes at a large urban hospital between

November 5, 1973 and March 4, 1974. All patients who met the criteria of the study were asked to participate. All patients who agreed to participate were asked to give written consent. The consent forms are contained in Appendix A of this study.

CRITERIA FOR SUBJECT SELECTION

The criteria for subject selection were similar to those of the original study for the purpose of comparison:

1. has a primary or secondary diagnosis of diabetes mellitus;
2. falls into one of the following classes:
 - a) newly diagnosed diabetics,
 - b) diabetes out of control,
 - c) diabetes with complication(s),
 - d) ante-partum patients,
 - e) patients with unrelated medical conditions,
 - f) post-surgical patients;
3. is 18 years of age or over;
4. speaks and writes English;
5. is sighted;
6. is taking insulin or an oral hypoglycemic agent;
7. consents to participate;
8. lives within a fifty mile radius of Vancouver City;
9. has no current diagnosis of mental or emotional problems;
10. is not a member of the health professions; and
11. has completed the five sessions of the group instruction.

THE TOOL

The "Diabetic Teaching Tool" was developed by Skelton for use in individual instruction. The tool was subjected to a critical

review and revision by a panel of experts to establish validity.¹

No changes were made in the content of the tool but slides were used instead of a flip chart. The content was organized so that it could be taught in five parts:

1. introduction
2. diet
3. medicine
4. exercise, hygiene and urine testing
5. problems.

Changes were required in the method of presentation to facilitate use in group instruction. In relation to diet, patients were given a copy of their own diet but received general information on diet planning. All patients were exposed to information concerning anti-diabetic pills and insulin. They were expected to know the type of medication they were receiving so that they could choose the information which applied to them. They were assisted by the nurse. The insulin-users were given only one opportunity to prepare their insulin. Equipment was provided so that they could practice at their bedside. The administration of insulin was demonstrated by the nurse but the patients were unable to give their own insulin at that time. The ward staff supervised the self-administration of insulin when the patients were ready to do it. Finally, only one opportunity was given to practice urine testing during the instruction. Again this was followed up by ward staff. Unfortunately, the outpatients did

¹Judith M. Skelton, "An Experimental Study to Evaluate the Effectiveness of a Diabetic Teaching Tool," (unpublished Master's thesis, University of British Columbia, 1973), 43.

not have this opportunity. The modified "Diabetic Teaching Tool" is contained in Appendix F of this study.

The modified tool was pretested on a group of six diabetics. The only changes required related to the teacher's performance, especially in directing the patients' attention to the slides.

The reader is referred to Skelton's thesis for a copy of the "Diabetic Teaching Tool" and the objectives for its use.

The knowledge and skill test developed by Skelton was pretested on approximately fourteen patients who attended two local diabetic classes and four professional people involved with the teaching of these classes. Question two caused some confusion for the patients as it required seven responses but only four spaces were available on the answer sheet. It was decided to move this question to number one as it was a different form of question from the others and to leave an open space for the answer. Some of the patients found it difficult to use a separate question and answer sheet. Thus, the two were combined. Finally, the professional people questioned whether you should consult a doctor whenever you have a corn or a callus. This was in reference to question 23(E). The question was then changed to read, "you have a flu" rather than omit it and change the total number of questions.

THE PROCEDURE

The steps followed in the performance of this study were:

1. Permission was obtained from the institution to conduct the study.
2. Discussion was held with Skelton concerning the possi-

bility of using the "Diabetic Teaching Tool."

3. Permission was obtained from Miles Laboratories to use the tool. Later, permission was obtained to modify it.

4. Pretesting of the knowledge test developed by Skelton was carried out. The changes made are previously outlined. The test is contained in Appendix E of this study.

5. The patient profile sheet was designed for the purpose of obtaining demographic and diabetic characteristics of the subjects. This profile sheet is contained in Appendix C of this study. It is similar to the one used by Skelton so that a comparison of the subjects using the "Diabetic Teaching Tool" and modified "Diabetic Teaching Tool" could be made.

6. The diabetic teaching program for the instruction of the control group of subjects was conducted by a dietician and a nurse. An outline of this program is contained in Appendix G of this study.

7. An explanation was given to each patient who met the criteria describing the purpose of the study and how it would be conducted. A written consent was obtained when the patient agreed to participate. This was followed by the administration of the test of diabetic learning which is contained in Appendix E of this study. All subjects were posttested, using the same test of diabetic learning, between two and seven days following completion of the instruction. The pretests were administered at the patient's bedside or in the classroom before commencement of instruction. The posttests were administered at the patient's bedside or in his own home. The patient profile sheet was completed at that time. A total of twelve subjects was obtained.

8. The "Diabetic Teaching Tool" was modified for use in group instruction. This modified tool is contained in Appendix F of this study.

9. Instruction by the researcher was provided for the nurse to familiarize her with the modified "Diabetic Teaching Tool."

10. Pretesting of the modified tool was conducted on a group of six patients. The tool was used for the instruction of the experimental group of subjects. The procedure followed was identical to that outlined in item seven. A total of twelve subjects was obtained.

DATA ANALYSIS

The control and experimental subjects were compared on the demographic and diabetic characteristics obtained from the patients' profile sheet. The t-test was used to analyze the test results. Then the Pearson product-moment correlation coefficient was used to compare the total percentage test scores with selected demographic and diabetic characteristics. A level of .05 was considered to be statistically significant for all tests. Finally, a descriptive comparison was made between the data obtained from the use of the modified "Diabetic Teaching Tool" and that obtained by Skelton from the use of the "Diabetic Teaching Tool" in individual instruction.

SUMMARY

This chapter has presented the methodology of the study. A description was given of the setting of the study, the criteria for subject selection, the tool, the procedure followed in the preparation and execution of the study and a brief outline of the method of data analysis.

CHAPTER IV

ANALYSIS OF THE DATA

INTRODUCTION

A total of twenty subjects agreed to participate in the control group of the study. Eight were later eliminated because of failure to attend the five classes. A total of eighteen subjects agreed to participate in the experimental group of the study. Six were later eliminated for a variety of reasons. Four of these six subjects failed to attend all five classes, one was found to have a diagnosis of a psychiatric nature and one was withdrawn by his doctor. No subjects withdrew from the study after completion of the five classes.

The findings of this study were analyzed in the following manner:

1. A comparison was made of the demographic and diabetic characteristics of the control and experimental subjects as obtained from the profile sheets. These characteristics were: age, sex, marital status, education, reason for current admission to hospital or visit to the doctor, age at onset of diabetes, length of time since diagnosed, type of control of condition and sources of information used.

2. A comparison was made of the control and experimental subjects on the difference in their pretest and posttest scores on the test of diabetic learning by means of the t-test.

3. An examination of the correlation between the total percentage score and the demographic and diabetic characteristics of the subjects using the Pearson product-moment correlation coefficient was conducted.

4. A descriptive comparison of the mean scores of the experimental group of this study on the test of diabetic learning and the mean scores obtained by Skelton using the "Diabetic Teaching Tool" for individual patient teaching was presented. These two groups were also compared on the demographic and diabetic characteristics of the subjects.

DEMOGRAPHIC AND DIABETIC CHARACTERISTICS OF THE SUBJECTS

Age

A comparison of the subjects by age is contained in Table I. One third of the subjects in each group were between fifty-five and sixty-four years of age. However, the experimental group had more subjects in the younger age categories. This resulted in a median age of forty-nine and one-half years for the experimental group while the median age for the control group was fifty-four and one-half years.

TABLE I
A COMPARISON OF CONTROL AND EXPERIMENTAL
SUBJECTS BY AGE

Age (years)	Control subjects	Experimental subjects
15 - 24	0	2
25 - 34	1	2
35 - 44	3	1
45 - 54	2	2
55 - 64	4	4
65 - 74	2	1
75 - 84	0	0
85 and over	0	0
Total	12	12

Sex

Table II indicates that the control and experimental group were quite similar in relation to sex. The control group consisted of seven females and five males while the experimental group had six females and six males.

TABLE II
A COMPARISON OF CONTROL AND EXPERIMENTAL
SUBJECTS BY SEX

Sex	Control subjects	Experimental subjects
Male	5	6
Female	7	6
Total	12	12

Marital Status

Table III shows a comparison of the control and experimental subjects by marital status. The majority of the subjects in each group were married. Ten out of twelve in the control group and seven out of twelve in the experimental group were married. The remainder of the control subjects were widowed while the remainder of the experimental subjects were either single or separated.

TABLE III
A COMPARISON OF CONTROL AND EXPERIMENTAL
SUBJECTS BY MARITAL STATUS

Marital status	Control subjects	Experimental subjects
Single	0	3
Married	10	7
Widowed	2	0
Divorced/Separated	0	2
Total	12	12

Education

The control and experimental subjects were quite similar in the level of education attained. Nine out of twelve subjects in each group had achieved grade ten or higher. These data are contained in Table IV.

TABLE IV
A COMPARISON OF CONTROL AND EXPERIMENTAL
SUBJECTS BY EDUCATION

Level of education completed	Control subjects	Experimental subjects
Less than grade 6	2	2
Grade 6 to 9	1	1
Grade 10 to 12	4	6
Beyond grade 12	5	3
Total	12	12

Reason for Current Admission to Hospital or Visit to Doctor

A comparison of the control and experimental subjects by reason for current admission to hospital or visit to the doctor is contained in Table V. The two groups of subjects were very similar. Each group had ten subjects with diabetes related diagnoses and two subjects with unrelated conditions. In addition, each group had eight inpatients and four outpatients.

TABLE V
A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS
BY REASON FOR CURRENT ADMISSION TO
HOSPITAL OR VISIT TO DOCTOR

Reason for current admission to hospital or visit to doctor	Control subjects	Experimental subjects
New diabetic	4	3
Regulation of diabetes	5	7
Complication of diabetes	1	0
Unrelated condition	2	2
Total	12	12

Age at Onset of Diabetes

Table VI shows that the experimental subjects were more evenly distributed throughout each of the age groups. The median age at onset for the control subjects was forty-four and one-half years and for the experimental group it was thirty-nine and one-half years. The experimental subjects were slightly younger at age of onset than the control subjects.

TABLE VI
A COMPARISON OF CONTROL AND EXPERIMENTAL
SUBJECTS BY AGE AT ONSET OF DIABETES

Age at onset of diabetes (years)	Control subjects	Experimental subjects
0 - 14	1	2
15 - 24	0	1
25 - 34	1	2
35 - 44	4	2
45 - 54	1	2
55 - 64	4	2
65 - 74	1	1
75 and over	0	0
Total	12	12

Length of Time Since Diagnosed

A comparison of the control and experimental subjects by length of time since diagnosed is contained in Table VII. Both groups had a similar number of newly diagnosed subjects. However, they differed in the number of subjects who were diagnosed for over five years. The control group had one-quarter of their subjects in this category while the experimental had one-half in this category. The median length of time since diagnosed was four and one-half years for the control subjects and five and one-half years for the experimental subjects.

TABLE VII

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS
BY LENGTH OF TIME SINCE DIAGNOSED

Length of time since diagnosed	Control subjects	Experimental subjects
1 day to 6 days	0	0
1 week to 3 months	4	5
4 months to 11 months	1	0
1 year to 5 years	4	1
Over 5 years	3	6
Total	12	12

Type of Control of Condition

The majority of the control subjects controlled their condition by diet and antidiabetic pills while the majority of the experimental subjects were controlled by diet and insulin. Thus the two groups of subjects differed greatly when compared on this characteristic. Table VIII contains these data.

TABLE VIII

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS
BY TYPE OF CONTROL OF CONDITION

Type of control of condition	Control subjects	Experimental subjects
Diet and antidiabetic pill	7	3
Diet and insulin	5	9
Total	12	12

Sources of Information

Finally, a comparison of the control and experimental subjects by sources of information which they have used is contained in Table IX. Ten sources of information were listed and most subjects indicated they had used more than one of these sources. The experimental subjects used more sources of information than the control subjects. In the control group, ten subjects listed classes as being most useful, one listed the nurse and one listed the doctor. In the experimental group, ten listed the classes as most useful and two listed the doctor. The sources listed as most useful were all used the week prior to completion of the profile sheet.

In summary, the demographic and diabetic characteristics of the control and experimental group were highly similar. The characteristics which showed the greatest difference were length of time since diagnosed and type of control of condition.

TABLE IX

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY
SOURCES OF INFORMATION WHICH THEY HAVE USED

Source of information	Control subjects	Experimental subjects
Classes	12	12
Pamphlets	9	5
Books	1	5
Radio	1	0
Newspaper	1	2
Television	5	3
Friend or relative	1	4
Doctor	5	8
Nurse	2	7
Dietician	1	6

A COMPARISON OF DIFFERENCES IN PRETEST AND
POSTTEST SCORES ON THE TEST OF
DIABETIC LEARNING

The test of diabetic learning consisted of a knowledge test for insulin-users, a knowledge test for antidiabetic pill-users, a diet-planning skill test, a urine-testing skill test, and an insulin-injecting skill test. The scores obtained on each of the subtests are contained in Appendix D of this study. The differences in the total percentage score obtained on the pretest and posttest of diabetic learning were analyzed by means of the t-test. This was followed by the use of the t-test to analyze the differences in the pretest and posttest scores of the subjects on the subtests of the test of diabetic learning. The results of these tests were related to the first hypothesis.

Table X contains a comparison of control and experimental subjects by the differences in the total percentage score on the pretest and posttest of diabetic learning. The mean for the experimental subjects was better than that of the control subjects. However, the difference was not statistically significant.

Then the differences in pretest and posttest scores obtained on the knowledge test were analyzed for the insulin-users and antidiabetic pill-users. Tables XI and XII contain these respective comparisons. Although in both instances the mean was better for the experimental group, the difference was not statistically significant.

The differences in the pretest and posttest scores for control and experimental subjects on the diet-planning skill test are contained in Table XIII. In this case the mean for the control subjects was better than the mean for experimental subjects but the

TABLE X

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY
DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST
AND POSTTEST OF DIABETIC LEARNING

Control subjects	Experimental subjects
11.0	6.5
12.9	6.9
13.3	9.0
14.2	13.0
14.3	16.0
20.5	17.2
24.0	27.5
26.5	41.8
28.0	48.5
34.0	55.1
48.5	56.5
51.7	75.4
$\bar{C} = 24.90$	$\bar{E} = 31.11$

$t = 0.791$ (not significant)

TABLE XI

A COMPARISON OF CONTROL AND EXPERIMENTAL INSULIN-
 USERS BY DIFFERENCE IN PRETEST AND POSTTEST
 SCORES ON KNOWLEDGE TEST

Control subjects	Experimental subjects
3.0	0.5
6.5	1.0
10.0	4.0
15.5	7.5
35.0	16.5
	32.5
	37.0
	40.0
	56.5
$\bar{C} = 14.0$	$\bar{E} = 21.72$

$t = 0.73$ (not significant)

TABLE XII

A COMPARISON OF CONTROL AND EXPERIMENTAL PILL-USERS
BY DIFFERENCE IN PRETEST AND POSTTEST SCORES
ON KNOWLEDGE TEST

Control subjects	Experimental subjects
4.0	23.5
6.0	24.0
9.0	15.0
9.0	
20.0	
25.5	
33.0	
$\bar{C} = 15.21$	$\bar{E} = 20.83$

$t = 0.822$ (not significant)

TABLE XIII

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY
DIFFERENCE IN PRETEST AND POSTTEST SCORES
ON DIET-PLANNING SKILL TEST

Control subjects	Experimental subjects
0.0	1.0
0.5	1.0
-0.5	1.5
2.0	2.0
5.0	2.5
12.0	3.5
14.0	3.5
14.0	6.5
14.0	16.0
14.5	17.5
15.5	18.0
15.5	19.5
$\bar{C} = 8.875$	$\bar{E} = 7.708$

$t = 0.397$ (not significant)

difference was not statistically significant.

The mean for the experimental subjects was considerably higher than the mean for the control subjects on the urine-testing skill test. Once again it was not statistically significant. These data are contained in Table XIV.

Table XV contains the comparison of the differences in pre-test and posttest scores for both groups on insulin-injecting technique. The mean for both groups of subjects was very similar and no statistically significant difference was found.

The scores on the skill tests were then combined with the related knowledge scores as extracted from the knowledge test. The total possible score that could be obtained on the knowledge and skill tests for diet-planning was thirty-six points. A comparison of the pretest and posttest difference in this combined score for both groups is contained in Table XVI. The mean for the control group was slightly better than that of the experimental group but the difference was not statistically significant.

The scores on the knowledge and skill tests of urine-testing were combined for a total of twenty points. The differences in the pretest and posttest scores are compared in Table XVII. There was considerable difference in the mean of both groups in favor of the experimental subjects. The t-test analysis showed a difference which was significant at the .05 level.

Table XVIII shows a similar comparison for both groups of subjects on the insulin knowledge and skill tests. The total possible score was twenty-one points. The mean of the experimental subjects was higher than that of the control subjects. Here again, the

TABLE XIV

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY
DIFFERENCE IN PRETEST AND POSTTEST SCORES
ON URINE-TESTING SKILL TEST

Control subjects	Experimental subjects
0.0	0.0
0.0	1.0
-0.5	1.0
-0.5	1.5
-0.5	2.0
0.5	2.5
1.0	3.5
1.0	3.5
2.5	3.5
3.0	4.0
3.0	7.0
7.0	7.0
$\bar{C} = 1.375$	$\bar{E} = 3.042$

$t = 1.844$ (not significant)

TABLE XV

A COMPARISON OF CONTROL AND EXPERIMENTAL INSULIN-USERS
 BY DIFFERENCE IN PRETEST AND POSTTEST SCORES
 ON INSULIN-INJECTING SKILL TEST

Control subjects	Experimental subjects
0.0	-0.5
0.5	0.0
1.0	0.5
6.0	1.5
9.0	1.5
	2.5
	8.0
	9.0
	10.0
$\bar{C} = 3.3$	$\bar{X} = 3.6$

$t = 0.136$ (not significant)

TABLE XVI

A. COMPARISON OF THE CONTROL AND EXPERIMENTAL SUBJECTS
 BY DIFFERENCE IN PRETEST AND POSTTEST SCORES
 ON KNOWLEDGE AND SKILL TESTS OF
 DIET-PLANNING

Control subjects	Experimental subjects
6.0	2.0
7.0	3.5
7.0	3.5
7.5	4.5
8.5	6.5
10.0	8.0
16.0	9.0
16.0	11.5
17.0	18.0
20.5	24.0
25.5	24.5
25.5	32.5
$\bar{C} = 13.87$	$\bar{E} = 12.29$

$t = 0.443$ (not significant)

TABLE XVII

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY
DIFFERENCE IN PRETEST AND POSTTEST SCORES
ON KNOWLEDGE AND SKILL TESTS
OF URINE-TESTING

Control subjects	Experimental subjects
-0.5	0.0
-0.5	1.0
1.5	2.5
2.5	3.5
2.0	5.0
2.0	5.0
3.0	7.5
3.5	8.0
4.0	9.5
6.0	10.0
7.0	12.0
8.0	14.0
$\bar{C} = 3.2$	$\bar{E} = 6.5$

$t = 2.210$ (significant at the .05 level)

TABLE XVIII

A COMPARISON OF CONTROL AND EXPERIMENTAL SUBJECTS BY
DIFFERENCE IN PRETEST AND POSTTEST SCORES ON
INSULIN KNOWLEDGE AND SKILL TESTS

Control subjects	Experimental subjects
-1.0	-0.5
0.0	1.5
3.5	2.0
8.0	4.0
16.0	6.5
	7.5
	12.0
	14.0
	17.5
$\bar{C} = 5.3$	$\bar{E} = 7.167$

$t = 0.520$ (not significant)

difference was not statistically significant.

The findings of the data analysis resulted in acceptance of the first hypothesis which stated that there is no significant difference in the learning about self-care of subjects receiving group instruction by means of the modified "Diabetic Teaching Tool" as compared to subjects receiving group instruction by means of the diabetic teaching program.

CORRELATIONS BETWEEN DIFFERENCES IN TOTAL PERCENTAGE
SCORES ON PRETEST AND POSTTEST OF DIABETIC
LEARNING AND SELECTED DEMOGRAPHIC AND
DIABETIC CHARACTERISTICS OF SUBJECTS

This section of the data analysis contains an examination of the relationship between patient learning and selected demographic and diabetic characteristics. The selected characteristics are age at testing, education, age at onset of diabetes, reason for current admission to hospital or visit to the doctor and the length of time since diagnosed. Skelton found a statistically significant relationship between the total percentage test scores of control patients and age at testing, education and age at onset of diabetes but no such correlations characterized the experimental subjects.¹ This raised the possibility that these characteristics might influence the learning of subjects in other groups. It was also decided to examine the remaining two characteristics on the basis that they might be significantly related to learning in group instruction.

The relationship between age at testing and difference in total percentage score on the pretest and posttest of diabetic learning is contained in Table XIX. No significant correlation existed for the control or experimental group.

Table XX shows that no correlation existed between the level of education and the difference in total percentage score on the pretest and posttest of diabetic learning.

¹Judith M. Skelton, "An Experimental Study to Determine the Effectiveness of a Diabetic Teaching Tool," (unpublished Master's thesis, University of British Columbia, 1973), 84.

TABLE XIX

THE CORRELATION BETWEEN AGE AT TESTING AND DIFFERENCE
IN TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST
OF DIABETIC LEARNING

Age (Years)	Difference in total percentage score	
	Control subjects	Experimental subjects
15-24	(1) ...	6.5
	(1) ...	17.2
25-34	(2) 51.7	6.9
	(2) ...	75.4
35-44	(3) 11.0	9.0
	(3) 12.9	...
	(3) 13.3	...
45-54	(4) 14.2	13.0
	(4) 28.0	16.0
55-64	(5) 20.5	27.5
	(5) 26.5	41.8
	(5) 34.0	55.1
	(5) 48.5	56.5
65-74	(6) 14.3	48.5
	(6) 24.0	...
75-84	(7)
85 and over	(8)

$$r_G = -0.05 \text{ (not significant)}$$

$$r_E = 0.42 \text{ (not significant)}$$

TABLE XX

THE CORRELATION BETWEEN EDUCATION AND DIFFERENCE IN
TOTAL PERCENTAGE SCORE ON PRETEST AND POSTTEST
OF DIABETIC LEARNING

Education	Difference in total percentage score		
		Control subjects	Experimental subjects
Less than grade 6	(1)	12.9	9.0
	(1)	24.0	56.5
Grade 6 to 9	(2)	34.0	55.1
Grades 10 to 12	(3)	13.3	6.5
	(3)	14.2	27.5
	(3)	20.5	48.5
	(3)	48.5	...
Beyond grade 12	(4)	11.0	6.9
	(4)	14.3	13.0
	(4)	26.5	16.0
	(4)	28.0	17.2
	(4)	51.7	41.8
	(4)	...	75.4

$r_C = 0.14$ (not significant)

$r_E = -0.16$ (not significant)

Again no correlation was found between age at onset of diabetes and difference in scores obtained by subjects in both groups. Table XXI contains these data.

Table XXII indicates that no correlation was found between length of time since diagnosed and difference in the total percentage score on both tests for the control group. However a significant correlation was found to be present in the experimental group.

Finally, a t-test was used to determine the relationship between the reason for current admission to hospital or visit to the doctor and the difference in the total percentage score on the pre-test and posttest of diabetic learning. No statistically significant relationship was found for either group of subjects. These data are contained in Table XXIII.

In summary, no statistically significant relationship was found between patient learning and the selected characteristics of age at testing, education, age at onset of diabetes and the reason for current admission to hospital or visit to the doctor for either the control or experimental group. However, there was a statistically significant relationship in the experimental group between learning and the length of time since diagnosed.

TABLE XXI

THE CORRELATION BETWEEN AGE AT ONSET OF DIABETES AND
DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST
AND POSTTEST OF DIABETIC LEARNING

Age at onset (years)	Difference in total percentage score		
		Control subjects	Experimental subjects
0-14	(1)	12.9	6.5
	(1)	...	17.2
15-24	(2)	...	6.9
25-34	(3)	51.7	9.0
	(3)	...	75.4
35-44	(4)	11.0	13.0
	(4)	13.3	41.8
	(4)	14.2	...
	(4)	20.5	...
45-54	(5)	28.0	16.0
	(5)	...	56.5
55-64	(6)	14.3	27.5
	(6)	26.5	55.1
	(6)	34.0	...
	(6)	48.5	...
65-74	(7)	24.0	48.5
75 and over	(8)

r_C = 0.22 (not significant)

r_E = 0.48 (not significant)

TABLE XXII

THE CORRELATION BETWEEN LENGTH OF TIME SINCE DIAGNOSED
AND DIFFERENCE IN TOTAL PERCENTAGE SCORE ON PRETEST
AND POSTTEST OF DIABETIC LEARNING

Length of time since diagnosed	Difference in total percentage score	
	Control subjects	Experimental subjects
1 day to 6 days
1 week to 3 months	(1) 13.3	16.0
	(1) 24.0	27.5
	(1) 26.5	48.5
	(1) 51.7	55.1
	(1) ...	75.4
4 months to 11 months	(2) 48.5	...
1 year to 5 years	(3) 11.0	56.5
	(3) 14.2	...
	(3) 14.3	...
	(3) 28.0	...
over 5 years	(4) 12.9	6.5
	(4) 20.5	6.9
	(4) 34.0	9.0
	(4) ...	13.0
	(4) ...	17.2
	(4) ...	41.8

$r_C = -0.33$ (not significant)

$r_E = -0.59$ (significant at the .05 level)

TABLE XXIII

A COMPARISON BETWEEN REASON FOR CURRENT ADMISSION TO
HOSPITAL OR VISIT TO DOCTOR AND DIFFERENCE IN TOTAL
PERCENTAGE SCORE ON PRETEST AND POSTTEST OF
DIABETIC LEARNING

Difference in total percentage score			
Control subjects		Experimental subjects	
Diabetes- related admissions	Unrelated admissions	Diabetes- related admissions	Unrelated admissions
11.0	20.5	6.5	16.0
12.9	48.5	6.9	27.5
13.3		9.0	
14.2		13.0	
14.3		17.2	
24.0		41.8	
26.5		48.5	
28.0		55.1	
34.0		56.5	
51.7		75.4	
$\bar{C} = 22.99 \quad \bar{C}^1 = 34.5$		$\bar{E} = 32.99 \quad \bar{E}^1 = 21.75$	

$t_C = 1.087$ (not significant)

$t_E = 0.600$ (not significant)

A COMPARISON OF THE SCORES OF SUBJECTS USING THE MODIFIED
"DIABETIC TEACHING TOOL" IN GROUP INSTRUCTION AND THE
SCORES OF SUBJECTS USING THE "DIABETIC TEACHING
TOOL" IN INDIVIDUAL INSTRUCTION

Skelton studied the effectiveness of the "Diabetic Teaching Tool" on twenty subjects who received individual instruction. This group of subjects was compared with the subjects taught by means of the modified "Diabetic Teaching Tool" in group instruction in the following manner:

1. a comparison of demographic and diabetic characteristics of both groups of subjects;
2. a comparison of the mean score achieved by all subjects on the subtests of the test of diabetic learning and of the mean total percentage score obtained.

The median age of the subjects in Skelton's study was fifty years and in the experimental subjects of this study it was forty-nine and one-half years. The subjects were also similar in distribution by sex. Skelton's study had 60 percent females while this study had 50 percent females. The majority of subjects in both groups were married. Although a different method was used to determine the educational level it appears that both groups of subjects are highly similar. A similarity is also present in the length of time since diagnosed. One-half of the subjects in each group had been diagnosed for over five years. However, there were some areas of difference. This study had fewer subjects who were admitted to hospital because of conditions unrelated to diabetes. Skelton had eight out of twenty with unrelated conditions while this study had two out of twelve. There was also some difference in the age at onset of diabetes. The median age of the subjects obtained by Skelton was in the forty-five

to fifty-four year range and the median age for subjects in this study was in the thirty-five to forty-four range. Thus the subjects in this study were slightly younger at onset of diabetes. Finally, the two groups of subjects differed on type of control of condition. One-half of Skelton's subjects were controlled by diet and anti-diabetic pills and one-half by diet and insulin. This study had one-quarter of its subjects being controlled by diet and antidiabetic pills and three-quarters being controlled by diet and insulin.

Thus there was a great deal of similarity between the group of subjects who were taught by the "Diabetic Teaching Tool" in individual instruction and the group of subjects who were taught by the modified "Diabetic Teaching Tool" in group instruction.

The posttest scores obtained by the two groups of subjects on the test of diabetic learning were also highly similar. The two groups were compared by means obtained but no statistical test was used. Table XXIV contains these data. Finally the mean of the total percentage score obtained by the two groups of subjects was compared. The subjects taught by means of the "Diabetic Teaching Tool" obtained a mean of 75.97 and the subjects taught by means of the modified "Diabetic Teaching Tool" obtained a mean of 80.48.

In summary, although no statistical test was used to compare the scores of the two groups of subjects the means obtained indicate a high degree of similarity. These findings resulted in acceptance of the second hypothesis which stated that there is no significant difference in the scores on the test of diabetic learning of subjects receiving group instruction by means of the modified "Diabetic Teaching Tool" as compared to subjects receiving individual instruction by means of the "Diabetic Teaching Tool."

TABLE XXIV

A COMPARISON OF THE MEAN SUBTEST SCORES OBTAINED BY
SUBJECTS TAUGHT BY INDIVIDUAL INSTRUCTION AND
SUBJECTS TAUGHT BY GROUP INSTRUCTION

Test	Mean Score	
	Subjects taught by individual instruction*	Subjects taught by group instruction
Knowledge test for pill-users	52.15	48.16
Knowledge test for insulin-users	56.95	59.61
Diet-planning skill test	16.30	18.16
Urine-testing skill test	6.75	8.37
Insulin-injecting skill test	9.50	9.55
Knowledge and skill tests of diet-planning	28.42	29.75
Knowledge and skill tests of urine-testing	14.90	16.95
Insulin knowledge and skill tests	17.60	17.66

*Permission to use these scores was given by Skelton.

CHAPTER V

SUMMARY, DISCUSSION OF THE FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

SUMMARY

This experimental study was designed to determine if the modified "Diabetic Teaching Tool" was an effective tool for use in group instruction. The hypotheses tested in this study were: first, there is no significant difference in the learning, about self-care, of subjects receiving group instruction by means of the modified "Diabetic Teaching Tool" as compared to subjects receiving group instruction by means of the diabetic teaching program; and second, there is no significant difference in the scores on the test of diabetic learning of subjects receiving group instruction by means of the modified "Diabetic Teaching Tool" as compared to subjects receiving individual instruction by means of the "Diabetic Teaching Tool."

The study was conducted in a large urban hospital. It involved twenty-four subjects who attended the regularly scheduled diabetic classes in that institution. These subjects met the criteria of the study and gave written consent to participate. The first twelve subjects were assigned to the control group and received group instruction by means of the institution's diabetic teaching program. The last twelve subjects were assigned to the experimental group and received group instruction by means of the modified "Diabetic Teaching Tool." A dietitian and a nurse participated in the teaching

of the control group; a nurse performed the teaching of the experimental group. All subjects were tested before commencement of the instruction and tested again from two to seven days after completion of the instruction.

A review of the literature showed that group instruction is being used to teach patients with a variety of conditions. The nurse is taking a more active role in teaching but it is a function that is not well developed. Finally, there was massive support for the need to teach diabetics about self-care.

The two groups of subjects were compared on the demographic and diabetic characteristics obtained from the patient profile sheet. The t-test was used to analyze the test results. The Pearson product-moment correlation coefficient was used to compare the test results and selected demographic and diabetic characteristics of the subjects. Finally, a descriptive comparison was made between the experimental subjects of this study and the subjects of Skelton's study who were taught by means of the "Diabetic Teaching Tool" in individual instruction. A comparison of the mean scores of these two groups of subjects on the test of diabetic learning was also undertaken.

DISCUSSION OF THE FINDINGS

The control and experimental subjects were highly similar when compared on the demographic and diabetic characteristics obtained from the profile sheet.

The average age of the control subjects was fifty-four and one-half years. The group consisted of five males and seven females. Ten of the twelve subjects were married and two were widowed. The

educational level attained was better than grade ten for nine out of twelve subjects. Only two subjects were admitted to hospital because of a condition unrelated to diabetes. The median age at onset of diabetes was forty-four and one-half years while the median length of time since diagnosed was four and one-half years. Control of condition was maintained by diet and antidiabetic pills for seven of the subjects and by diet and insulin for the remaining five subjects. They had used a variety of sources of information to learn about their condition but ten of the twelve subjects listed the classes as the most useful, one listed the nurse and one listed the doctor.

The average age of the experimental subjects was forty-nine and one-half years. The group was evenly divided into males and females. Seven of the twelve subjects were married, three were single and two were separated. The educational level attained was better than grade ten for nine of the twelve subjects. Only two were admitted to hospital because of a condition unrelated to diabetes. The median age at onset of diabetes was thirty-nine and one-half years while the median length of time since diagnosed was five and one-half years. Control of condition was maintained by diet and antidiabetic pills for three of the subjects and by diet and insulin for the remaining subjects. They, too, had used a variety of sources of information to learn about their condition. However, ten listed the classes as most useful and two listed the doctor.

The test of diabetic learning consisted of a knowledge test for insulin-users, a knowledge test for antidiabetic pill-users, a diet-planning skill test, a urine-testing skill test, and an insulin-injecting skill test. The difference in the pretest and posttest

scores for all subjects on these subtests of the test were subjected to t-test analysis. In addition the scores on the skill test were combined with the related knowledge scores as extracted from the knowledge test. These were also subjected to t-test analysis.

A comparison of the two groups of subjects by the differences in total percentage score on the pretest and posttest of diabetic learning showed no statistically significant difference. This was probably due to the fact that the content presented to both groups of subjects was highly similar. The main differences were the use of slides accompanied by nurse's instructions for the experimental subjects and the distribution of a printed handout (with material corresponding to that presented by the instructor) to each subject. The control subjects each received a copy of the Canadian Diabetic Association Handbook for Diabetics and viewed a twenty minute film.

The control subjects did slightly better on the diet planning skill test and on the combined knowledge and skill diet-planning tests but the difference was not statistically significant. A suggested reason for the difference in scores in this section was that the control subjects were taught by a dietician who also had contact with the subjects outside the class. The experimental subjects were taught by a nurse who had no previous experience in this area and who had no contact with the subjects outside the class.

No statistically significant difference between the two groups was found in the urine-testing skill test but there was a significant difference in the combined scores on the knowledge and skill tests of urine-testing. The experimental subjects may have done better in this area as a result of having to practice the correct technique in the classroom and because they were given precise printed information

about urine-testing. This might have resulted in an increased awareness of the need to be very familiar with the topic.

Again no statistically significant difference in the two groups of subjects was found when compared on the insulin-injecting skill test and the combined insulin knowledge and skill tests. This probably resulted from the fact that all inpatients who had not had experience with self-injections were adequately supervised by ward staff. The majority of outpatients were not receiving insulin or were already skilled in the procedure.

These findings resulted in acceptance of the first hypothesis.

The final statistical analysis was the correlation between the difference in the pretest and posttest scores on the test of diabetic learning by total percentage score and the following demographic and diabetic characteristics: age at testing, education, age at onset of diabetes, duration of diabetes and reason for current admission to hospital or visit to the doctor. There was no correlation between any of these characteristics and the score difference for the control subjects. The only significant relationship for the experimental group was between score difference and duration of diabetes. A possible reason for this finding was the fact that the experimental group contained more subjects who had been diagnosed for over five years. Some of these subjects had high scores on the pretest which did not allow for much change in scores.

Some suggested reasons for the lack of a significant difference in the learning of the two groups of subjects were:

1. All subjects were aware that they would be posttested.
2. Some subjects in each group mentioned the need to study for the test.

3. The same nurse taught both groups. Her group teaching techniques were highly similar in both situations.

4. A greater percentage of subjects in the experimental group had been diagnosed for over five years. Some of these subjects had very high pretest scores which did not allow for much change as a result of attendance at class.

5. The sample size was too small.

A comparison of the demographic and diabetic characteristics of the subjects receiving group instruction by means of the modified "Diabetic Teaching Tool" and those of the subjects receiving individual instruction by means of the "Diabetic Teaching Tool" showed a high similarity between the two groups of subjects. The mean of both groups of subjects by total percentage scores on the test of diabetic learning and of the mean scores on the subtests of the test were also highly similar. On the basis of these findings the second hypothesis was accepted.

CONCLUSIONS

The conclusions drawn from the results of this study are:

1. The modified "Diabetic Teaching Tool" is equally as effective as the established diabetic teaching program for the teaching of self-care to diabetics in small groups.

2. The modified "Diabetic Teaching Tool" is equally as effective as the "Diabetic Teaching Tool" for the teaching of self-care to diabetics.

3. The group instruction method is equally as effective as individual instruction in the teaching of diabetics about self-care.

4. Planned group teaching is effective for subjects regardless of age at time of teaching, educational level attained, age at onset of diabetes, duration of diabetes and reason for current admission to hospital or visit to doctor. Duration of diabetes was a factor in the learning of patients in the experimental group. However, many of these attended for a refresher and were already knowledgeable about their condition.

5. The low number of elderly people in the study might indicate that the nursing staff are not sending them to class rather than that they are not available.

IMPLICATIONS

Group instruction is an effective means of teaching self-care to diabetics. This teaching should be well planned and conducted by a teacher who is familiar with the group process.

Nurses are becoming more involved in teaching patients. To facilitate this nursing activity, basic nursing education should include instruction in the dynamics of the group process.

Finally, the results of this study support the fact that group instruction can be as effective as individual instruction in the teaching of patients.

RECOMMENDATIONS

Recommendations for Use of the Test

The following recommendations are made regarding the use of the test of diabetic learning.

1. A revision of the test so that it consists of only one

form of question or a division of the test so that each division contains only one form of question.

2. A revision of question twenty-three as some subjects objected to having to consult a doctor whenever some of the stated events occurred.

Recommendations for Further Research

The following recommendations are made for further investigation:

1. A replication of this study using a larger sample.
2. A replication of this study using only outpatients. This would eliminate the incidental teaching which occurs for inpatients, thus giving a more accurate estimate of the learning as a result of exposure to the tool.
3. A replication of this study using a third group of patients who do not attend any teaching program.
4. A study conducted to compare the "Diabetic Teaching Tool" in individual instruction and the modified "Diabetic Teaching Tool" in group instruction.

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APPENDIX A

CONSENT FORMS

CONSENT TO ACT AS SUBJECT FOR STUDY

Subject's Name: _____ Date: _____

I hereby consent to participate in a diabetic teaching program using the modified "Diabetic Teaching Tool" and to be tested before and after the information is presented.

An explanation has been given to me by Miss Matilda Burke.

This is part of a study on diabetic teaching to be performed by Miss Matilda Burke and an assistant.

I understand that there are no risks involved and that no identifying information will appear in the completed study.

I further understand that I am free to withdraw from the study at any time.

Subject's Signature

CONSENT TO ACT AS SUBJECT FOR STUDY

Subject's Name: _____ Date: _____

I hereby consent to participate in a diabetic teaching program using the Vancouver General Hospital diabetic teaching program and to be tested before and after the information is presented.

An explanation has been given to me by Miss Matilda Burke.

This is part of a study on diabetic teaching to be performed by Miss Matilda Burke and an assistant.

I understand that there are no risks involved and that no identifying information will appear in the completed study.

I further understand that I am free to withdraw from the study at any time.

Subject's Signature

APPENDIX B

RECORD OF DIABETIC TEACHING

RECORD OF DIABETIC TEACHING

Subject's Name: _____

<u>TOPIC</u>	<u>DATE COMPLETED</u>
1. Film and Discussion	_____
2. Dietary Control	_____
3. Urine Testing	_____
4. Medicine	_____
5. Insulin Reaction and Diabetic Coma	_____

RECORD OF DIABETIC TEACHINGwith Modified "Diabetic Teaching Tool"

Subject's Name: _____

<u>TOPIC</u>	<u>DATE COMPLETED</u>
1. Introduction	_____
2. Dietary Control	_____
3. Medicine	_____
4. Exercise, Personal Hygiene, and Urine Testing	_____
5. Problems	_____

APPENDIX C

PATIENT PROFILE SHEET

PATIENT PROFILE SHEET

Patient Number: _____

A. AGE

- | | |
|----------|----------------|
| 1. 15-24 | 5. 55-64 |
| 2. 25-34 | 6. 65-74 |
| 3. 35-44 | 7. 75-84 |
| 4. 45-54 | 8. 85 and over |

B. SEX

1. Male
2. Female

C. MARITAL STATUS

1. Single
2. Married
3. Widowed
4. Divorced/separated

D. EDUCATION

1. Less than Grade 6
2. Grades 6 to 9
3. Grades 10 to 12
4. Beyond Grade 12

E. REASON FOR CURRENT ADMISSION
TO HOSPITAL OR VISIT TO
DOCTOR

1. New diabetic
2. Regulation of diabetes
3. Complication of diabetes
4. Unrelated condition

F. AGE AT ONSET OF DIABETES

- | | |
|----------|----------------|
| 1. 0-14 | 5. 45-54 |
| 2. 15-24 | 6. 55-64 |
| 3. 25-34 | 7. 65-74 |
| 4. 35-44 | 8. 75 and over |

G. LENGTH OF TIME SINCE
DIAGNOSED

1. 1 day to 6 days
2. 1 week to 3 months
3. 4 months to 11 months
4. 1 year to 5 years
5. Over 5 years

H. CONTROL OF CONDITION

1. Diet & antidiabetic pill
2. Diet and Insulin

I. ANTIDIABETIC PILL

Name _____
Dose _____ (milligrams)
Time _____

J. INSULIN

1. Name _____
Strength _____
Dose _____ (units)
Time _____
2. Name _____
Strength _____
Dose _____ (units)
Time _____

K. URINE TESTING

Reagents _____ & _____

Time(s) _____

L. CHECK ANY OF THE FOLLOWING SOURCES OF INFORMATION WHICH YOU HAVE USED

_____ classes	_____ television
_____ pamphlets	_____ friend or relative
_____ books	_____ doctor
_____ radio	_____ nurse
_____ newspaper	_____ dietician

M. OF THOSE WHICH YOU HAVE CHECK WHICH WAS THE MOST USEFUL?N. HOW RECENTLY HAVE YOU USED IT?O. DIET PLAN (ATTACHED)

APPENDIX D

MATERIAL PERTAINING TO THE
SCORES OBTAINED

Specification for the Test of Diabetic Learning

Scores Obtained by Control and Experimental Group
on Knowledge and Skill Test

TABLE XXV
 SCORES OBTAINED BY CONTROL AND EXPERIMENTAL
 INSULIN-USERS ON KNOWLEDGE TEST

Scores of control subjects (75 max.)		Scores of experimental subjects (75 max.)	
Pretest	Posttest	Pretest	Posttest
28.0	31.0	9.0	46.0
31.0	41.0	14.0	70.5
31.0	66.0	17.5	50.0
40.5	47.0	27.0	67.0
49.0	64.5	32.5	36.5
		46.5	63.0
		53.5	61.0
		70.0	71.0
		71.0	71.5

TABLE XXVI
 SCORES OBTAINED BY CONTROL AND EXPERIMENTAL
 PILL-USERS ON KNOWLEDGE TEST

Scores of control subjects (70 max.)		Scores of experimental subjects (70 max.)	
Pretest	Posttest	Pretest	Posttest
16.0	36.0	8.0	31.5
17.5	26.5	29.0	53.0
18.0	51.0	45.0	60.0
30.0	55.5		
30.5	39.5		
41.5	45.5		
46.5	52.5		

TABLE XXVII
 SCORES OBTAINED BY CONTROL AND EXPERIMENTAL
 SUBJECTS ON DIET-PLANNING SKILL TEST

Scores of control subjects (20 max.)		Scores of experimental subjects (20 max.)	
Pretest	Posttest	Pretest	Posttest
0.0	0.0	0.0	16.0
0.0	12.0	0.0	17.5
0.0	14.0	0.0	18.0
0.0	14.0	0.0	19.5
0.0	14.0	13.0	16.5
0.0	14.5	13.5	20.0
0.0	15.5	15.0	17.5
0.0	15.5	16.5	17.5
10.5	15.5	16.5	18.0
15.0	14.5	16.5	20.0
17.0	19.0	17.0	18.0
19.0	19.5	17.5	19.5

TABLE XXVIII
 SCORES OBTAINED BY CONTROL AND EXPERIMENTAL
 SUBJECTS ON URINE-TESTING SKILL TEST

Scores of control subjects (10 max.)		Scores of experimental subjects (10 max.)	
Pretest	Posttest	Pretest	Posttest
0.0	1.0	0.0	7.0
0.0	7.0	0.0	7.0
3.0	3.0	4.0	7.5
5.0	4.5	5.0	8.5
5.0	6.0	5.5	9.0
5.0	8.0	6.0	6.0
5.0	8.0	6.0	8.0
5.5	5.0	6.0	10.0
7.0	6.5	7.5	8.5
7.0	9.5	7.5	10.0
8.0	8.0	8.0	9.0
9.0	10.0	8.5	10.0

TABLE XXIX
 SCORES OBTAINED BY CONTROL AND EXPERIMENTAL
 INSULIN-USERS ON INSULIN-INJECTING SKILL
 TEST

Scores of control subjects (11 max.)		Scores of experimental subjects (11 max.)	
Pretest	Posttest	Pretest	Posttest
0.0	6.0	0.0	8.0
0.0	0.0	0.0	9.0
0.0	9.0	0.0	10.0
9.5	10.5	8.0	7.5
10.5	11.0	8.0	9.5
		8.0	10.5
		9.0	10.5
		9.5	10.0
		11.0	11.0

A BASIC COURSE IN DIABETIC SELF-MANAGEMENT
SPECIFICATIONS FOR THE TEST OF DIABETIC LEARNING¹

Topics	Insulin-Users			Antidiabetic Pill-Users		
	Know-ledge	Skill	Total	Know-ledge	Skill	Total
1 Diet	16	20	36	16	20	36
2 Medication	10	11	21	5	0	5
3 Urine tests	10	10	20	10	10	20
4 Exercise	4	0	4	4	0	4
5 Foot care	5	0	5	5	0	5
6 Complications	18	0	18	18	0	18
7 Resources	12	0	12	12	0	12
Total	75	41	116	70	30	100

¹Judith M. Skelton "An Experimental Study to Determine the Effectiveness of a Diabetic Teaching Tool" (unpublished Master's thesis, University of British Columbia, 1973), p. 120.

APPENDIX E

TEST OF DIABETIC LEARNING²

Knowledge Test for Insulin Users

Knowledge Test for Antidiabetic Pill-Users

Diet-Planning Skill Test

Urine-Testing Skill Test

Insulin-Injection Skill Test

²The property of Miles Laboratories.

TEST OF DIABETIC LEARNING
(for Insulin Users)

Subject Number: _____

Score: _____

PART I: KNOWLEDGE (75 points)

Please place ALL your answers on this test paper. For multiple-choice or true-false questions, circle the correct response. For all other types of questions, write the correct response in the space provided.

1. What are the names of the American/Canadian Diabetic Association Food Exchange Groups?

2. The following foods are allowed on a diabetic diet:

(A) buttermilk	True	False
(B) ice cream	True	False
(C) marmalade	True	False
(D) mayonnaise	True	False
(E) noodles	True	False

3. Foods in one exchange group may be:

(A) changed for foods in another list.	True	False
(B) changed for foods in the same list.	True	False
(C) changed for dietetic foods of any sort.	True	False
(D) all eaten at the same meal.	True	False

4. Insulin causes the amount of sugar in the blood to increase.

	True	False
--	------	-------

5. (A) What is the name of the insulin you are taking?

- (B) Do you use U40 or U80 insulin? _____

- (C) How many units of your insulin do you take each time?

- (D) What time of day do you take your insulin?

- (E) What time of day must you be most careful of insulin reactions?

- (F) How does your insulin act to help your diabetes?

- (G) May extra insulin be stored in the freezer? Yes____ No____

- (H) May you inject the same site twice in the same month? Yes____ No____

5. (I) When should you avoid exercising?
 A. immediately after breakfast.
 B. immediately before lunch.
 C. immediately before supper.
 D. immediately after supper.
 E. late in the evening.
6. If a diabetic person has had no complications, he need not test his urine. True False
7. Routine urine tests for sugar should be made:
 (A) just before meals. True False
 (B) on "double-voided" specimens. True False
 (C) one hour after meals. True False
 (D) each time a diabetic urinates. True False
8. Your urine might test positive for sugar if
 (A) you had eaten too much. True False
 (B) you had taken too much insulin. True False
 (C) you had a fever. True False
 (D) you were emotionally upset. True False
 (E) you exercised too much. True False
9. Exercise tends to raise the blood sugar level. True False
10. The amount of exercise a diabetic person does affects the amount of insulin he requires. True False
11. What would you be alert for if you took more exercise than normal?
 A. insulin reaction.
 B. diabetic coma.
 C. muscle cramps.
 D. an infection.
12. What would you do if you had taken more exercise than normal?
 A. take only $\frac{1}{2}$ the usual amount of insulin the next day.
 B. eat twice as much bread at the next meal.
 C. take twice the usual amount of insulin the next day.
 D. eat or drink something sweet immediately.
13. You should take especially good care of your feet because:
 (A) a number of years of injecting insulin, into the legs may cause swelling of the feet. True False
 (B) as diabetic patients become older they may have poor circulation in their feet. True False
 (C) foot injuries may be harder to heal in diabetics than in other people. True False

14. If you have a sore on your foot you should
 A. soak it in hot water and apply a sterile bandage.
 B. soak it in cold water and apply iodine.
 C. wash it well with warm water and apply a sterile bandage.
 D. wash it well with warm water and apply iodine.
15. The BEST thing to do if you have corns or callouses on your feet is to
 A. trim them carefully with manicure scissors.
 B. treat them with a commercial corn and callous remover.
 C. notify your doctor.
 D. soak them in hot water and rub them off with an emery board.
16. A diabetic coma might be caused by
 (A) not enough insulin. True False
 (B) not enough food. True False
 (C) a fever. True False
 (D) too much exercise. True False
17. An insulin reaction might be caused by
 (A) too much insulin. True False
 (B) too much food. True False
 (C) a fever. True False
 (D) too much exercise. True False
18. Column A contains a list of signs and symptoms of diabetic complications. Column B contains a list of diabetic complications. On the line to the left of each sign and symptom, put the letter of the complication of which each is characteristic. Each response in Column B may be used once, more than once, or not at all.
- | <u>COLUMN A</u> | <u>COLUMN B</u> |
|-------------------------------|---------------------|
| ____ (1) dry skin and tongue | A. infection |
| ____ (2) hunger | B. diabetic coma |
| ____ (3) fever | C. insulin reaction |
| ____ (4) fruity breath | |
| ____ (5) thirst | |
| ____ (6) feeling of faintness | |
19. If you were going into a diabetic coma, how would your urine test?
 A. positive for sugar; negative for acetone.
 B. positive for sugar; positive for acetone.
 C. negative for sugar; negative for acetone.
 D. negative for sugar; positive for acetone.

20. When feeling the symptoms of a diabetic coma, you would
- take your prescribed insulin.
 - phone the doctor.
 - eat some sugar.
 - go for a walk.
 - both A and B.
21. When feeling the symptoms of an insulin reaction, you would
- eat some sugar.
 - take some extra insulin.
 - go for a walk.
 - lie down and rest.
 - both B and D.
22. If nauseated and ill with the flu, you would
- skip your regular insulin and eat less.
 - skip your urine tests.
 - take your regular insulin and eat less.
 - take your regular insulin and eat soft foods or fluids.
23. You should consult your doctor whenever:
- | | | |
|---|------|-------|
| (A) you have an insulin reaction. | True | False |
| (B) you have acetone in your urine. | True | False |
| (C) you are planning an unusual amount of exercise. | True | False |
| (D) you have a cut or scrape. | True | False |
| (E) you have a flu. | True | False |
| (F) you have a fever. | True | False |
| (G) you have sugar in your urine. | True | False |
| (H) you wish to alter your diet. | True | False |
24. Column A contains a list of services provided for diabetics. Column B contains a list of people or organizations who provide these services. On the line to the left of the service put the letter of the person or organization which provides each service. Each response in Column B may be used once, more than once, or not at all.

COLUMN ACOLUMN B

- | | |
|--|----------------------------------|
| _____ (1) adjust your diet prescription | A. Victorian Order of Nurses |
| _____ (2) provide free diet counselling | B. Canadian Diabetic Association |
| _____ (3) adjust your prescription for insulin | C. Doctor |
| _____ (4) give insulin injections at home | |

TEST OF DIABETIC LEARNING
(for Antidiabetic Pill-Users)

Subject Number: _____

Score: _____

PART I: KNOWLEDGE (70 points)

Please place ALL your answers on this test paper. For multiple-choice or true-false questions, circle the correct response. For all other types of questions, write the correct response in the space provided.

1. What are the names of the American/Canadian Diabetic Association Food Exchange Groups?

2. The following foods are allowed on a diabetic diet:

(A) buttermilk	True	False
(B) ice cream	True	False
(C) marmalade	True	False
(D) mayonnaise	True	False
(E) noodles	True	False

3. Foods in one exchange group may be:

(A) changed for foods in another list.	True	False
(B) changed for foods in the same list.	True	False
(C) changed for dietetic foods of any sort.	True	False
(D) all eaten at the same meal.	True	False

4. Insulin causes the amount of sugar in the blood to increase.

True False

5. (A) What is the name of the antidiabetic pill you are taking?

(B) How many milligrams of your antidiabetic drug do you take each time?

(C) What time of day do you take your antidiabetic drug?

(D) How does your antidiabetic drug act to help your diabetes?

6. If a diabetic person does not take insulin, he need not test his urine.

True False

7. Routine urine tests for sugar should be made:
- | | | |
|------------------------------------|------|-------|
| (A) just before meals. | True | False |
| (B) on "double-voided" specimens. | True | False |
| (C) one hour after meals. | True | False |
| (D) each time a diabetic urinates. | True | False |
8. Your urine might test positive for sugar if:
- | | | |
|---|------|-------|
| (A) you had eaten too much. | True | False |
| (B) you had not taken your antidiabetic pill. | True | False |
| (C) you had a fever. | True | False |
| (D) you were emotionally upset. | True | False |
| (E) you exercised too much. | True | False |
9. Exercise tends to raise the blood sugar level. True False
10. The amount of exercise a diabetic person does affects the amount of antidiabetic drug he requires. True False
11. What would you be alert for if you took more exercise than normal?
- | | | |
|-----------------------|--|--|
| (A) insulin reaction. | | |
| (B) diabetic coma. | | |
| (C) muscle cramps. | | |
| (D) an infection. | | |
12. What would you do if you had taken more exercise than normal?
- | | | |
|---|--|--|
| (A) take only ½ an antidiabetic pill the next day. | | |
| (B) eat twice as much bread at the next meal. | | |
| (C) take twice as many antidiabetic pills the next day. | | |
| (D) eat or drink something sweet immediately. | | |
13. You should take especially good care of your feet because:
- | | | |
|---|------|-------|
| (A) a number of years of taking antidiabetic drugs may cause swelling of the feet. | True | False |
| (B) as diabetic patients become older they may have poor circulation in their feet. | True | False |
| (C) foot injuries may be harder to heal in diabetics than in other people. | True | False |
14. If you have a sore on your foot you should
- | | | |
|---|--|--|
| (A) soak it in hot water and apply a sterile bandage. | | |
| (B) soak it in cold water and apply iodine. | | |
| (C) wash it well with warm water and apply a sterile bandage. | | |
| (D) wash it well with warm water and apply iodine. | | |

15. The BEST thing to do if you have corns or callouses on your feet is to
 (A) trim them carefully with manicure scissors.
 (B) treat them with a commercial corn and callous remover.
 (C) notify your doctor.
 (D) soak them in hot water and rub them off with an emery board.
16. A diabetic coma might be caused by:
 (A) not enough antidiabetic drug. True False
 (B) not enough food. True False
 (C) a fever. True False
 (D) too much exercise. True False
17. An insulin reaction might be caused by:
 (A) too much antidiabetic drug. True False
 (B) too much food. True False
 (C) a fever. True False
 (D) too much exercise. True False
18. Column A contains a list of signs and symptoms of diabetic complications. Column B contains a list of diabetic complications. On the line to the left of each sign and symptom, put the letter of the complication of which each is characteristic. Each response in Column B may be used once, more than once, or not at all.

COLUMN ACOLUMN B

- ____ (1) dry skin and tongue
 ____ (2) hunger
 ____ (3) fever
 ____ (4) fruity breath
 ____ (5) thirst
 ____ (6) feeling of faintness

- A. infection
 B. diabetic coma
 C. insulin reaction

19. If you were going into a diabetic coma, how would your urine test?
 (A) positive for sugar; negative for acetone.
 (B) positive for sugar; positive for acetone.
 (C) negative for sugar; negative for acetone.
 (D) negative for sugar; positive for acetone.
20. When feeling the symptoms of a diabetic coma, you should
 (A) take your prescribed antidiabetic pill.
 (B) phone the doctor.
 (C) eat some sugar.
 (D) go for a walk.
 (E) both A and B.

21. When feeling the symptoms of an insulin reaction, you would
 (A) eat some sugar.
 (B) take an extra antidiabetic pill.
 (C) go for a walk.
 (D) lie down and rest.
 (E) both B and D.
22. If nauseated and ill with the flu, you would
 (A) skip your regular antidiabetic pill and eat less.
 (B) skip your urine tests.
 (C) take your regular antidiabetic pill and eat less.
 (D) take your regular antidiabetic pill and eat soft foods or fluids.
23. You should consult your doctor whenever:
- | | | |
|---|------|-------|
| (A) you have an insulin reaction. | True | False |
| (B) you have acetone in your urine. | True | False |
| (C) you are planning an unusual amount of exercise. | True | False |
| (D) you have a cut or scrape. | True | False |
| (E) you have the flu. | True | False |
| (F) you have a fever. | True | False |
| (G) you have sugar in your urine. | True | False |
| (H) you wish to alter your diet. | True | False |
24. Column A contains a list of services provided for diabetics. Column B contains a list of people or organizations who provide these services. On the line to the left of the service put the letter of the person or organization which provides each service. Each response in Column B may be used once, more than once, or not at all.

<u>Column A</u>	<u>Column B</u>
_____ (1) adjust your diet prescription	A. Victorian Order of Nurses
_____ (2) provide free diet counselling	B. Canadian Diabetic Association
_____ (3) adjust your prescription for antidiabetic drug	C. Doctor
_____ (4) give insulin injections at home	

TEST OF DIABETIC LEARNINGPART II: SKILLSA. Diet Planning (20 points)

Patient Number: _____

Score: _____

You have been given: (1) a copy of your own meal plan, and
(2) a set of the American/Canadian Diabetic Association food exchange lists.

Using these, plan your meals for a total day. Be sure to write down both the name and the amount of each food to be eaten at each meal. Indicate the amount in terms of standard household measurements (e.g. teaspoons, tablespoons, cups, etc.).

TEST OF DIABETIC LEARNINGPART II: SKILLS

Patient Number: _____

Score: _____

B. Urine Testing (10 points)1. Testing for Sugar (a) with Clinitest

STEPS	YES	NO
(1) Holds dropper in upright position.		
(2) Places 5 (or 2) drops of urine in test tube.		
(3) Places 10 drops of water in test tube.		
(4) Puts water in test tube first or rinses dropper after putting urine in.		
(5) Positions dropper so that drops do not slide down sides of test tube.		
(6) Adds Clinitest tablet without touching it with moist fingers.		
(7) Waits 15 seconds after boiling has stopped to read.		
(8) Shakes tube gently after reaction has stopped.		

(b) with Clinistix

STEPS	YES	NO
(1) Does not touch test area of stick with fingers.		
(2) Dips test-area of stick into urine to moisten.		
(3) Waits 10 seconds before reading results.		
(4) Does not set stick down while waiting to read results.		

(c) with Testape

STEPS	YES	NO
(1) Does not touch test-end of tape with fingers.		
(2) Moistens test-end of tape by dipping in urine.		
(3) Waits 1 minute before reading results.		
(4) Does not set tape down while waiting to read results.		

Urine Testing (continued)

(d) with Diastix

STEPS	YES	NO
(1) Does not touch test area of stick with fingers.		
(2) Dips test area of stick into urine for 2 seconds.		
(3) Taps edge of strip against side of urine container or sink to remove excess urine.		
(4) Waits 30 seconds before reading results.		
Reads own sugar specimen correctly.		

2. Testing for Acetone (a) with Acetest Tablets

STEPS	YES	NO
(1) Places Acetest tablet on piece of clean white paper.		
(2) Places 1 drop of urine on tablet.		
(3) Waits 30 seconds before reading.		

(b) with Acetone Test Powder

STEPS	YES	NO
(1) Pours small mound of powder on clean white paper.		
(2) Adds enough urine to moisten completely (2-3 drops).		
(3) Waits 1 minute before reading.		

(c) with Ketostix

STEPS	YES	NO
(1) Does not touch test area of stick with fingers.		
(2) Waits 15 seconds after removing from urine before reading results.		
(3) Does not set stick down while waiting to read results.		
Reads acetone test specimen correctly.		

Urine Testing (continued)

3. Testing for Sugar and Acetone together (Ketodiastix)

Mark as for Diastix and Ketostix.

SCORING URINE TESTS: TECHNIQUE: ____/4 for urine sugar test
____/3 for urine acetone test

ACCURACY: ____/2 for urine sugar test
____/1 for urine acetone test

TOTAL: ____/10

TEST OF DIABETIC LEARNINGPART II: SKILLS

C. Insulin Injection (11 points)

Patient Number: _____

Score: _____

STEPS	YES	NO
(1) Gathers equipment.		
(2) Washes hands.		
(3) Rolls bottle of modified insulin between hands to mix.		
(4) Moistens cotton with alcohol.		
(5) Cleans rubber stopper of insulin bottle with alcohol.		
(6) EITHER empties syringe and needle of all alcohol (or H ₂ O) left from sterilization procedure OR opens disposable needle and syringe packages without contaminating.		
(7) Fills syringe with air equal to amount of insulin.		
(8) Pushes needle through centre of rubber stopper.		
(9) Injects air into bottle of insulin.		
(10) Fills syringe with insulin to correct amount.		
(11) Removes any air bubbles.		
(12) Cleans injection site by rubbing skin gently with cotton soaked in alcohol.		
(13) Pinches up large amount of flesh.		
(14) Inserts needle into skin at 60-90 degree angle.		
(15) Pulls plunger back gently.		
(16) Pushes plunger to inject insulin.		
(17) Injects prescribed amount of insulin.		
(18) Protects skin with (alcohol-soaked) cotton while withdrawing needle.		
Number of times aseptic technique violated (up to 4)		

$$\text{SCORE} = \frac{22 - (\# \text{No} + \# \text{Breaks in Asepsis})}{2} \quad (\text{total possible} = 11)$$

APPENDIX F

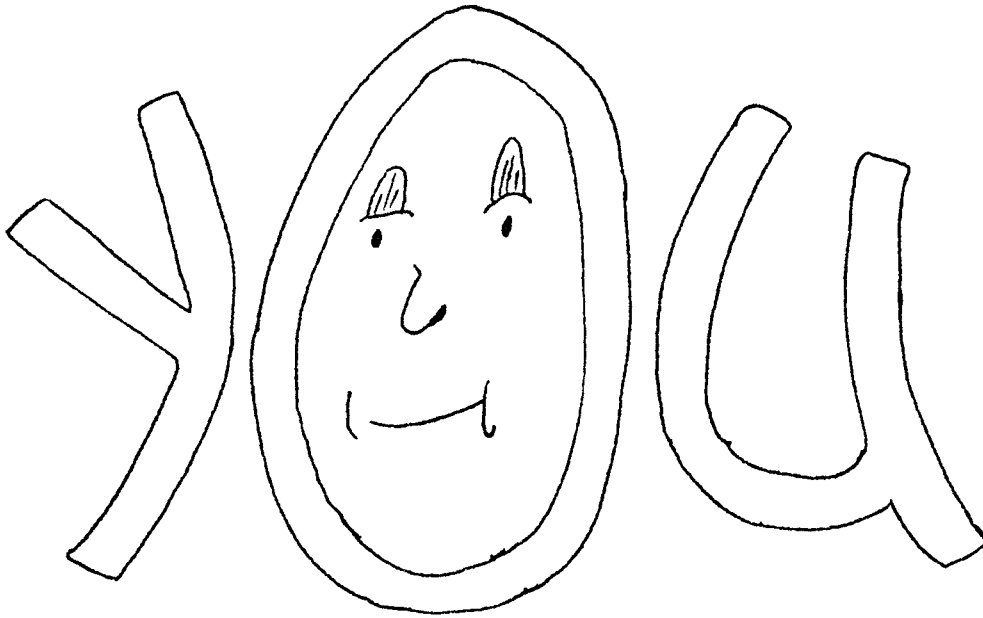
MODIFIED DIABETIC TEACHING TOOL³

Nurse's Instructions to Accompany Slides

Patient's Instructions for Handout

³The property of Miles Laboratories.

NURSE'S INSTRUCTIONS TO ACCOMPANY SLIDES

SLIDE 1

and diabetes

SLIDE 2Introduction

Diabetes is not an illness. You didn't "catch it", and when you care for it properly, it won't stop you from enjoying life.

Diabetes cannot be cared for by your doctor alone. Indeed, your doctor is depending on you to learn as much as you can about diabetes, so that you will be able to care for yourself.

There is quite a bit to learn, but it isn't very difficult if you take it one step at a time. To help you do this, this course on diabetes has been divided into five classes:

1. Introduction
2. Diet
3. Medicine
4. Exercise, Hygiene and Urine Testing
5. Problems

Most of the things the nurse will teach you are things that you will do yourself every day at home. Ask her lots of questions to be sure you understand what she is saying. Remember, in the long run, your diabetic care is up to you!

(Nurse's Instructions)

SLIDE 3Food-Energy Cycle

EXPLAIN:

"The human body is made up of millions of tiny cells. Therefore, each thing that the body does (working, playing and so on) is really done by a group of cells working together.

Cells need energy in order to work. When everything is working properly in the body, they make that energy by burning fuel which comes from the food one eats.

The body's biggest sources of fuel are sweet and starchy foods such as sugar, bread and cereals. However, other foods (such as meat, fruit and vegetables) can provide fuel too. After these foods are swallowed, the body changes them all to a simple form of sugar. It is this sugar which the cells use as fuel.

Sugar is carried to each cell in the body by the blood stream. In order for the sugar to get inside the cell however, insulin must be present. Insulin is a chemical made by the pancreas (an organ near the stomach). You may think of insulin as the key that opens the cell door to let the sugar in.

As long as one eats the proper foods ... and as long as the body is provided with enough insulin ... the food-energy cycle will work smoothly without any problems."

RELATE the above explanation to the slide provided - by pointing out where organs or processes occur - wherever possible.

GIVE each patient the sheet titled "Food-Energy Cycle" for his Take-home folder.

(Nurse's Instructions)

SLIDE 4Diabetic Food-Energy Cycle

EXPLAIN:

"As we said, insulin may be thought of as the key that opens the cell door to let sugar in. If your body is short of insulin for some reason, sugar won't be able to get into your cells.

When this happens, the sugar keeps backing up in your blood until it overflows into your urine. It is when this happens that you are found to have diabetes.

Diabetes, then, is a condition in which there isn't enough insulin in the blood to allow your food-energy cycle to work properly."

RELATE the above explanation to the slide provided - by pointing out where organs or processes occur - wherever possible.

GIVE each patient the sheet titled "Diabetic Food-Energy Cycle" for his Take-home folder.

(Nurse's Instructions)

SLIDE 5Symptoms

EXPLAIN:

Here are some of the things that you might have noticed because of your diabetes:

" 1. Because your body wasn't making enough insulin to allow your food-energy cycle to work properly -- therefore the amount of sugar in your blood rose and spilled over into your urine. Your kidneys had to work overtime to get rid of this sugar -- therefore you likely had to pass large amounts of urine quite often.

2. Because you were losing so much extra water this way, you probably were also very thirsty.

3. Because your body wasn't able to use its sugar-fuel properly, you might have lost weight, no matter how much you ate.

4. Because much of what you did eat was being lost as sugar in your urine, you were probably very hungry.

5. Because your blood sugar was not being changed into energy, you may have felt weak and tired.

When you are taking care of your diabetes properly, you won't have any of these symptoms. They are just your body's way of telling you that something needs to be done."

GIVE each patient the sheet titled "Symptoms" for his Take-home folder.

(Nurse's Instructions)

SLIDE 6One in Every Fifty Canadians

EXPLAIN:

"Knowing that you have diabetes may make you feel very lonely or very different from your friends and neighbours. It shouldn't! Diabetes is not an uncommon condition. One out of every 50 Canadians has it, and most of them are leading perfectly normal lives.

Many successful and famous people (businessmen, politicians, athletes, artists and performers) are diabetic. Because they are able to care for their diabetes so easily and so well, it hardly interferes with their lives at all. The same can apply to you!

Diabetes need not change your plans or your way of life. It will mean adding some new habits; but it won't mean missing old pleasures."

GIVE each patient the sheet titled "One in Every Fifty Canadians" for his Take-home folder.

SLIDE 7General Questions

DISCUSS the following material which may be of concern to the patients:

1. Marriage and Family

(a) "If you are single, diabetes shouldn't change your plans to marry. Because diabetes is so easy to care for, it causes no problems in relation to getting or staying married.

(b) In addition, diabetes in itself is no reason for not having children. Diabetic people can and do have perfectly healthy babies. However, the chance of having a diabetic child does increase if one or both of the parents are diabetic. You would be wise to talk to your doctor some more about this before starting a family.

(c) If you have children however, there is a better than average chance that they will develop diabetes. You should advise them to have a doctor check their blood and urine for sugar regularly."

2. Life Insurance

"Any life insurance policy you had before you developed diabetes will not be cancelled. As for new insurance, many companies today will give life insurance policies to diabetic people who are taking good care of themselves."

3. Work

"Diabetes should not stop you from working. Indeed, it probably won't even have much effect on the kind of work you can do. People with diabetes are engaged in almost every kind of work you could name (from desk jobs to labour to housework). Studies have shown that they do as well in their work -- in every way -- as do non-diabetics."

4. Sports and Other Activities

"Here again, there is no need to give up or to change anything that you enjoy. As a matter of fact, exercise is especially good for the person with diabetes. It helps to burn up sugar.

However, if your exercise pattern is likely to change greatly from one day to the next, you should discuss this with your doctor. He will want to adjust your meals and medicine to take this into account."

GIVE each patient one of the sheets titled "General Questions" for his Take-home folder. NOTE that there are two types of these sheets - one type for younger patients and one type for older patients.

(Nurse's Instructions)

SLIDE 8Balance = Good Health

EXPLAIN:

"You and your doctor share several aims or goals in the care of your diabetes. They are:

1. to get rid of the symptoms of your diabetes (OR if you have had no symptoms, to keep them from showing up);
2. to keep you from getting any complications of diabetes;
3. to keep you healthy; and at the same time
4. to interfere as little as possible with your normal daily life.

Reaching these goals depends upon keeping a careful balance between

1. your food - which provides the sugar in your blood stream; and
2. your insulin and exercise - which help your body use this sugar for energy.

Tipping the balance to either side will result in problems. Keeping it even will result in good health."

BE SURE that the patient has grasped the idea of "balance" in relation to his diabetes, as this concept is basic to several other explanations throughout the course.

GIVE each patient the sheet titled "Balance = Good Health" for his Take-home folder.

(Nurse's Instructions)

SLIDE 9Diet

EXPLAIN:

"You may be asking yourself why it is necessary for diabetics to follow a diet. By seeing to it that you eat the same kind and amount of food each day, you and your doctor are able to keep the sugar in your blood at a safe level.

Most foods can be changed into sugar by the body. However, some foods make more sugar than others. If you eat more food than your body needs, or too much of the wrong kinds of food, it may cause the sugar in your blood to build up. This will tip your good-health balance, and might cause some serious problems. Therefore, it is especially important for you to watch both the kind and the amount of food that you eat.

No two diabetics are exactly alike. So, each diabetic person's diet will be different from that of other diabetics. Only your doctor can work out the right diet for you.

Now there is no need to be discouraged about the idea of diet. You won't have to give up very many foods that you enjoy. You won't have to cook or eat meals different from your family's. You won't have to buy special foods or shop in special stores. You will have to learn a new way of planning your meals -- but this will soon become second nature to you."

GIVE each patient the sheet titled "Diet" for his Take-home folder.

(Nurse's Instructions)

SLIDE 10Kinds of Food

EXPLAIN:

"Your diet plan will call for foods such as milk, meat, vegetables, fruit, bread and cereals. These foods are necessary for good health and should be eaten every day by everyone -- non-diabetics and diabetics alike!

Nearly all foods have some carbohydrate, protein and fat in them. However, the amounts of each will be different in different kinds of foods.

Foods that have more carbohydrate than protein or fat are called carbohydrate foods. Carbohydrate foods are sugars, breads, cereals, fruits and vegetables.

Foods that have more protein than carbohydrate or fat are called protein foods. Protein foods are milk, cheeses, eggs, meats or fish.

Foods that have more fat than carbohydrate or protein are called fat foods. Some fat foods are butter, nuts and bacon.

In planning your diet, your doctor will make sure that you eat some carbohydrates, some proteins and some fats at every meal.

Each of these 3 types of food has a special job to perform:

1. Carbohydrate foods are used by the body in the same way that a car uses gasoline. They are burned by the cells to provide energy. While other foods may also provide energy, carbohydrates do so the fastest. Thus we may say that they are like "premium" gasoline.
2. Protein foods are used by the body for growth, for building muscles and for repairing any body damages, i.e. for "home building and maintenance".
3. Fat foods are also fuel foods. They, like carbohydrates, provide energy for the body. However, they do not act as quickly as carbohydrates -- so they are more like "regular" gasoline. Furthermore, if fats are not needed by the body at the time they are eaten, they may be stored -- sort of like a "spare tank" -- in the form of body fat."

GIVE each patient the sheet titled "Kinds of Food" for his Take-home folder.

(Nurse's Instructions)

SLIDE 11How the Doctor Plans Your Diet

EXPLAIN:

"As we said before, as a diabetic, you will need your own personalized diet. The doctor will take many things into account in planning this diet for you. Here are some of them.

1. Your age

Children, teenagers, pregnant women, and older adults all have special needs which determine the kind and amount of foods they should eat. Your doctor will plan your diet to meet the special needs of your age group.

2. Your weight

If you are overweight, your doctor will give you a diet that will help you to lose weight at first. Once you have reached the correct weight for you, your diet will be changed so that it helps you keep that weight.

3. Sex

Men and women have different food needs. Your doctor will take these into account.

4. Activity

As we said before, exercise causes the body to use up sugar. Therefore, more active people will need more food than less active ones. If your activity will change greatly from day to day, you may even need more than one diet plan. Talk this over with your doctor.

5. Over-all Health

An illness may cause your good-health balance of food, insulin and exercise to tip. Therefore, when you are ill, your doctor will adjust your diet to meet the special needs your body has at that time.

In addition, if you have some other condition besides diabetes, it may have to be considered in your diet plan as well."

GIVE each patient the sheet titled "How the Doctor Plans Your Diet" for his Take-home folder.

(Nurse's Instructions)

SLIDE 12Things You Need to Follow Your Diet

EXPLAIN:

"Following your diet on a day-to-day basis involves the use of two things:

1. The meal plan prepared by your doctor or dietician; and
2. The food exchange lists found in the Canadian Diabetic Association booklet "Meal Planning for Diabetics in Canada".

Usually the meal plan is given very simply -- for example, in terms of fruit, meat, bread, fat, milk and vegetables. With the food exchange lists these instructions can be followed out with a variety of tasty food choices."

GIVE each patient 1. a copy of his meal plan, and 2. a Canadian Diabetic Association "Meal Planning" booklet. The meal plan may be obtained from the hospital dietician. Suggest that the patient may plan his meals for a day and bring it with him next day so that he may have it checked.

EXPLAIN:

"You will recall that both the kind and the amount of food that you eat are important. The Canadian Diabetic Association Exchange Lists take care of both these things. First, they divide all of the foods you will eat into different kinds. Each of these makes up one Exchange List. There is a list for milk products, a list for meats, a list for fruits, a list for breads, a list for fats, and two lists for vegetables. In addition, there are two lists of "free foods". These lists are found on pages 7 to 20 of your "Meal Planning" booklet."

(Nurse's Instructions)

SLIDE 13Exchange System

EXPLAIN:

"In addition to helping you choose the correct kinds of food for your diet, the Canadian Diabetic Exchange Lists also tell you the amounts of food to eat. They do this by the size of the serving allowed. The idea behind this is that any measured serving of food on a given list can be traded for any other measured serving on the same list. For example, your meal plan may say that you can have a meat exchange for breakfast. When you look at the "Meat Exchange List" you will see that one egg is the same as three slices of crisp bacon or one and one-half sausages. There are dozens of meats on the list -- and you may have any one of them in the amount shown. Just remember: ONE EXCHANGE EQUALS ONE MEASURED SERVING.

In most cases it will not be necessary to weigh your foods in order to measure them. Most of the servings are given in terms of standard household measures - cups, teaspoons, tablespoons and inches. If you don't already have them, it would be wise to get a standard 8-ounce measuring cup, a set of measuring spoons and a small ruler. Measurements should be "level" - not heaped - and should usually be made after the food is cooked."

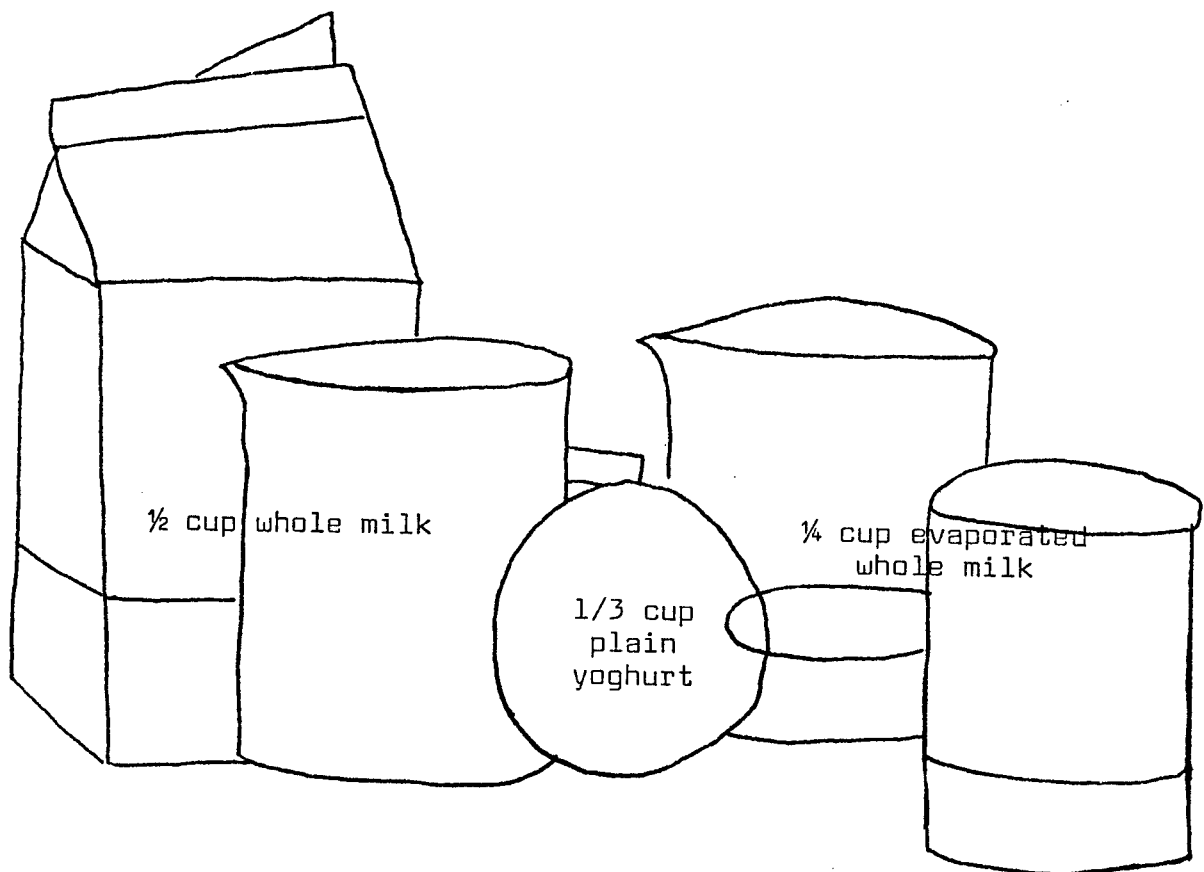
GIVE each patient the sheet titled "Things You Need to Follow Your Diet" and "Exchange System" for his Take-home folder.

BE SURE that each patient also has 1. a copy of his own meal plan, and 2. a "Meal Planning" booklet.

REVIEW each of the Canadian Diabetic Association exchange lists with the patients by means of the following nine slides.

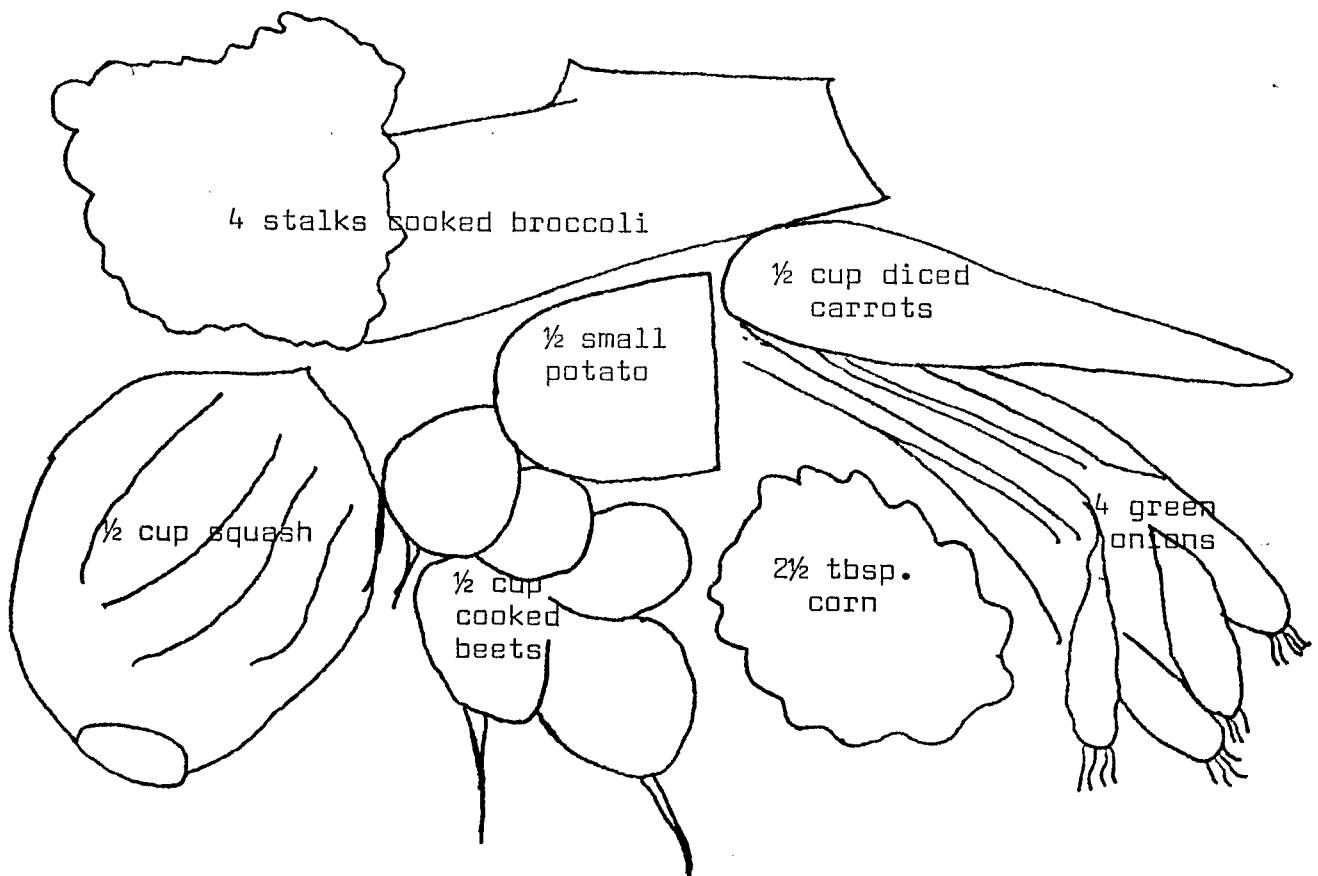
SLIDE 14Milk Exchanges

REVIEW the milk exchanges shown in this slide with the patients. HELP them to locate each in their "Meal Planning" booklet. EMPHASIZE that any of these milk products in the amount shown is equal to one milk exchange.



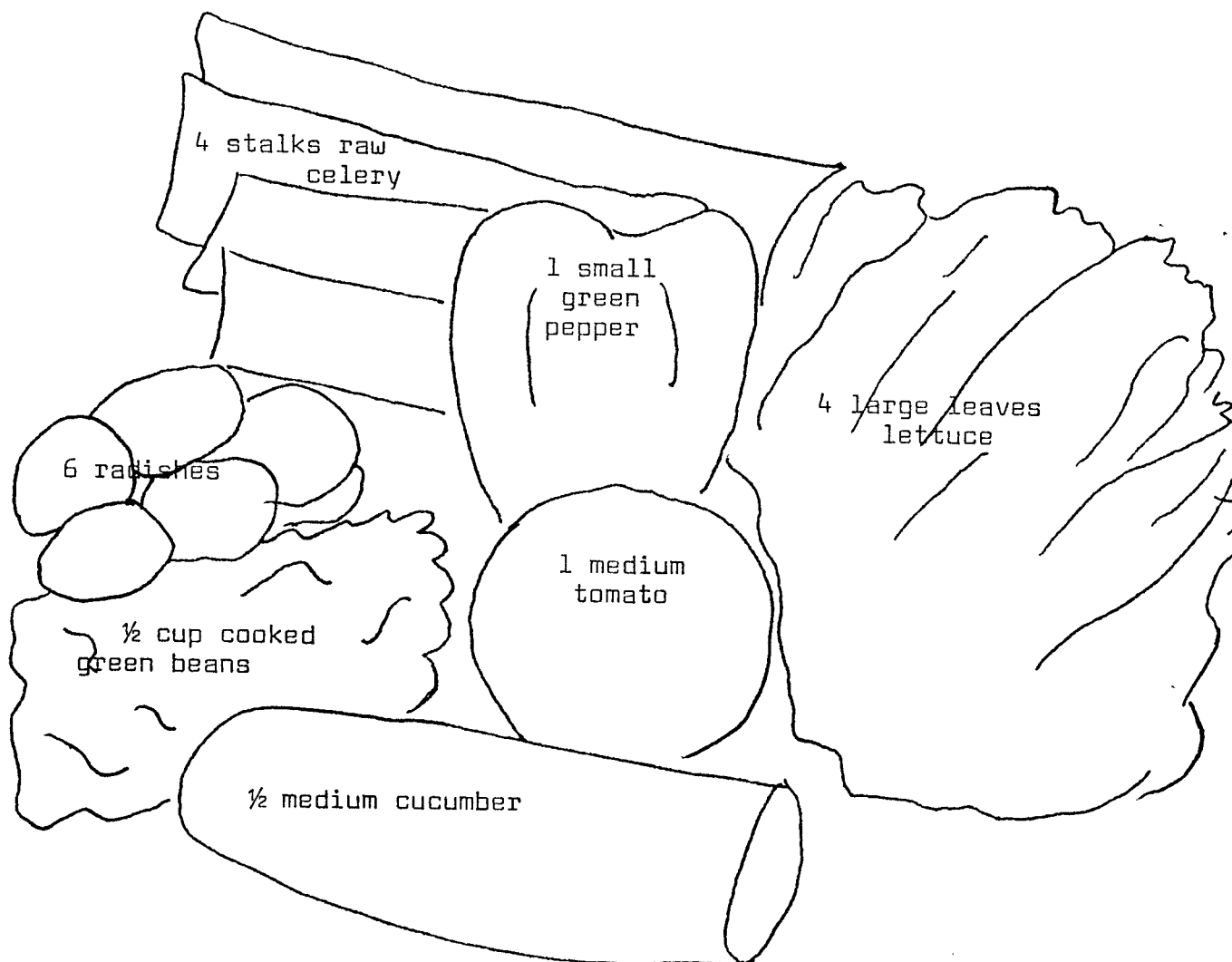
SLIDE 15Vegetable A Exchanges

REVIEW the vegetables shown in this slide with the patients. HELP them to locate each in their "Meal Planning" booklet. EXPLAIN that the "A" vegetables are the ones that have more carbohydrate in them. EMPHASIZE that any of these vegetables in the amount shown is equal to one vegetable A exchange.



SLIDE 16Vegetable B Exchanges

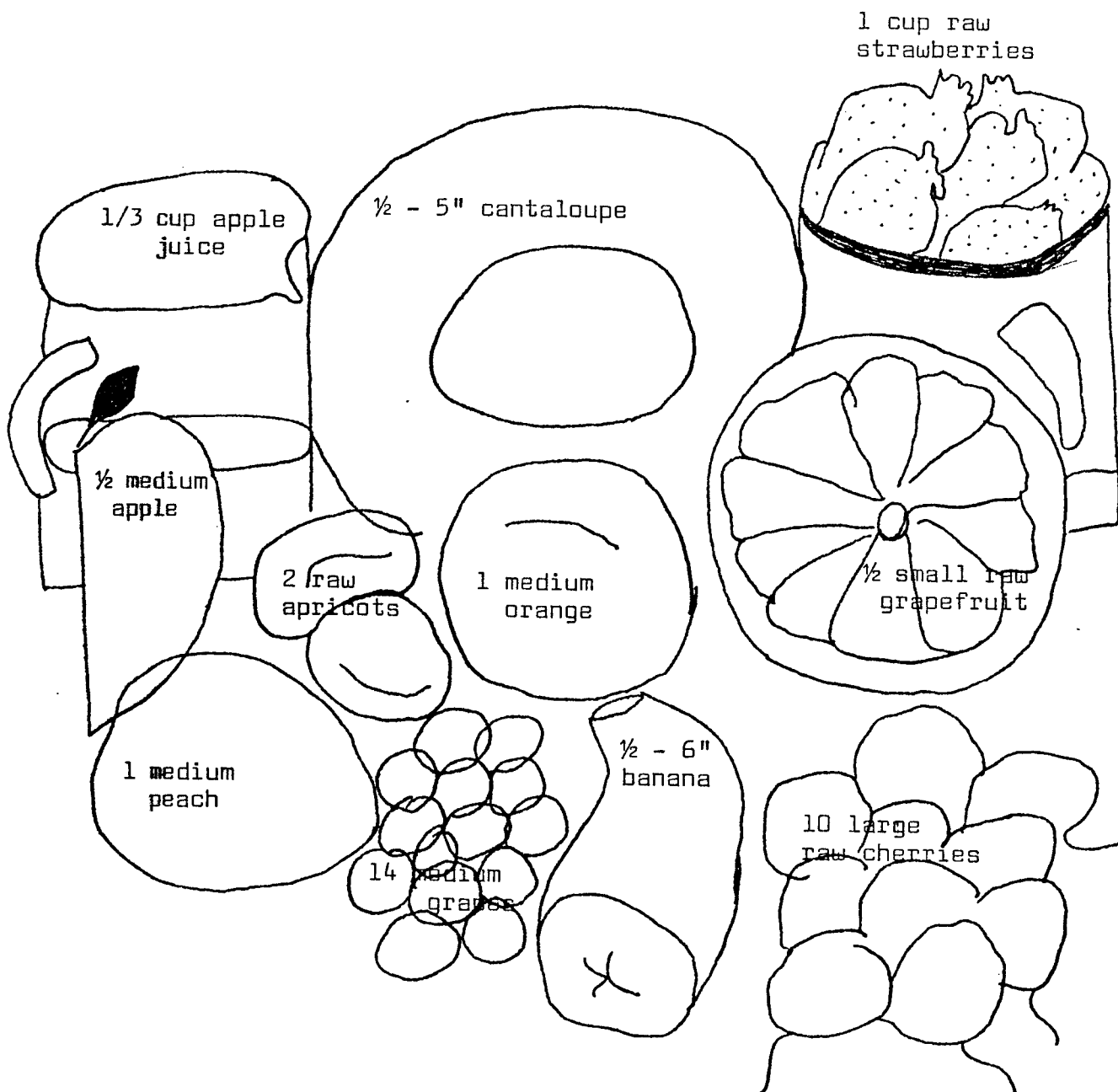
REVIEW the vegetables shown in this slide with the patients. HELP them to locate each in their "Meal Planning" booklet. EXPLAIN that the B vegetables are the ones that have less carbohydrate in them. EMPHASIZE that any of these vegetables in the amount shown is equal to one vegetable B exchange.



If you feel that it will not confuse the patients, explain to them that they may substitute 2 measured servings of "B" vegetables for one measured serving of "A" vegetables any time "A" vegetables are called for on their meal plan.

SLIDE 17Fruit Exchanges

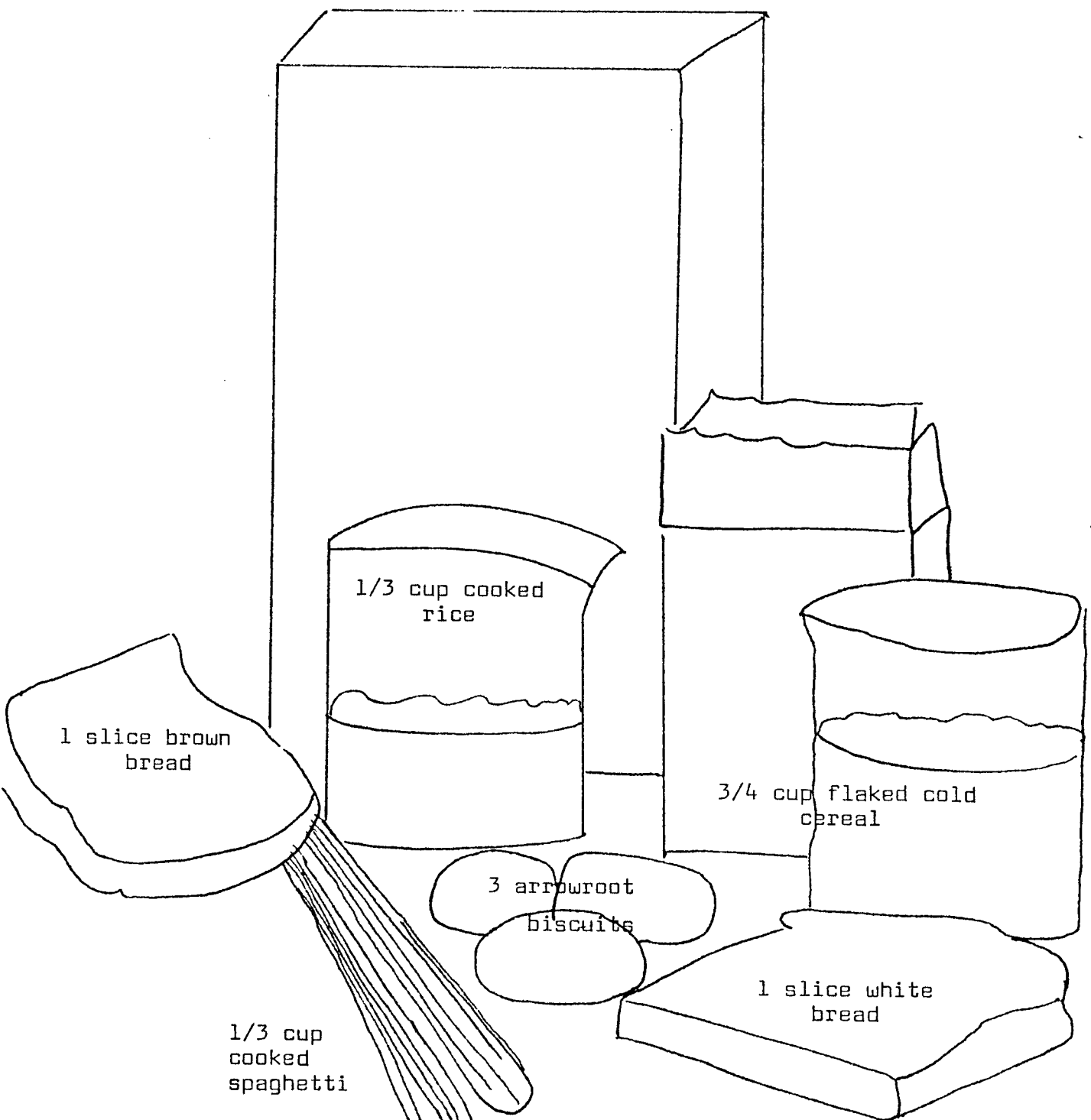
REVIEW the fruits shown in this slide with the patients.
 HELP them to locate each in their "Meal Planning" booklet.
 EMPHASIZE that any of these fruits in the amount shown is equal to one fruit exchange.



SLIDE 18

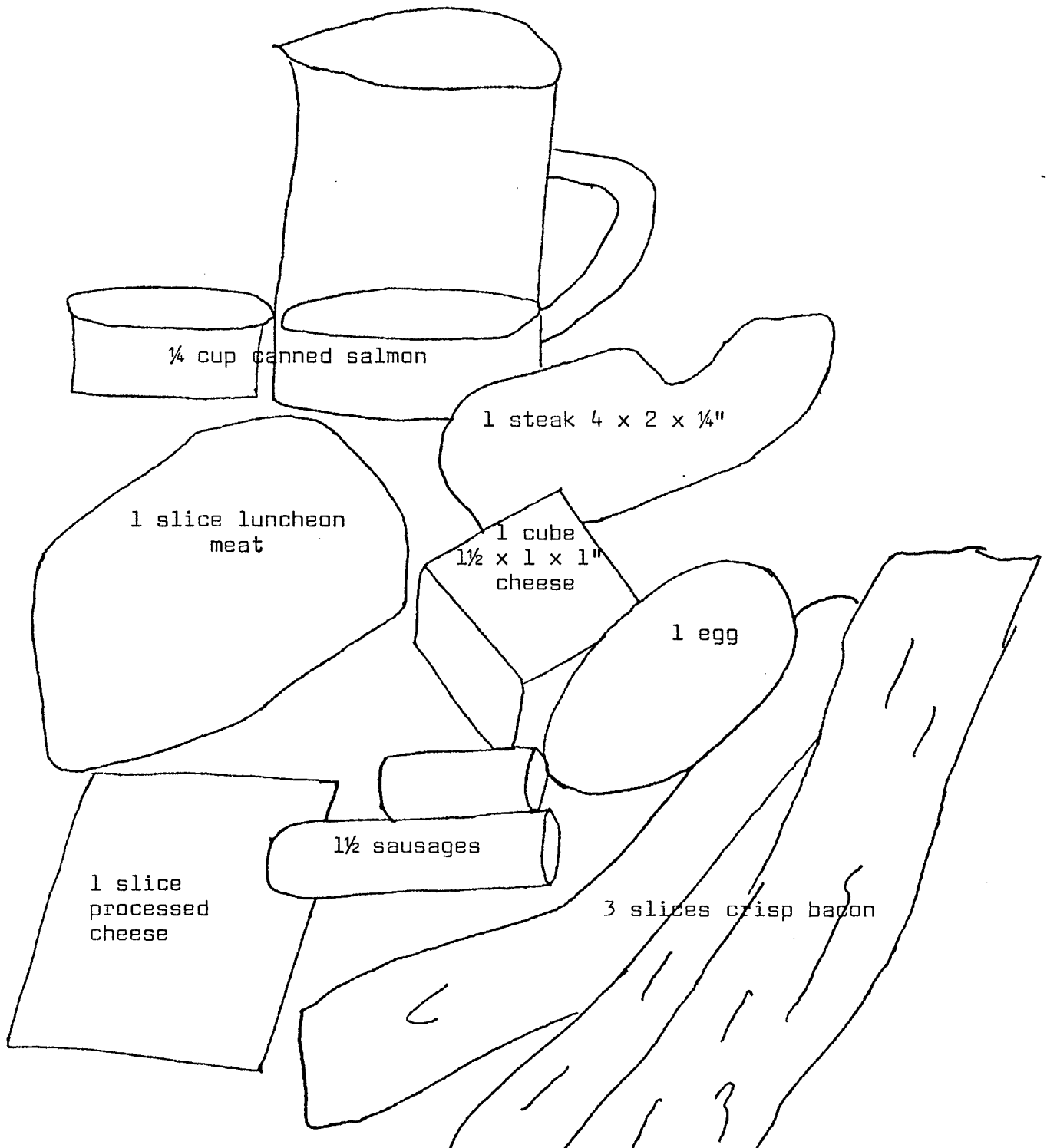
Bread Exchanges

REVIEW the bread exchanges shown in this slide with the patients. HELP them to locate each in their "Meal Planning" booklet. EMPHASIZE that any of these bread products in the amount shown is equal to one bread exchange.



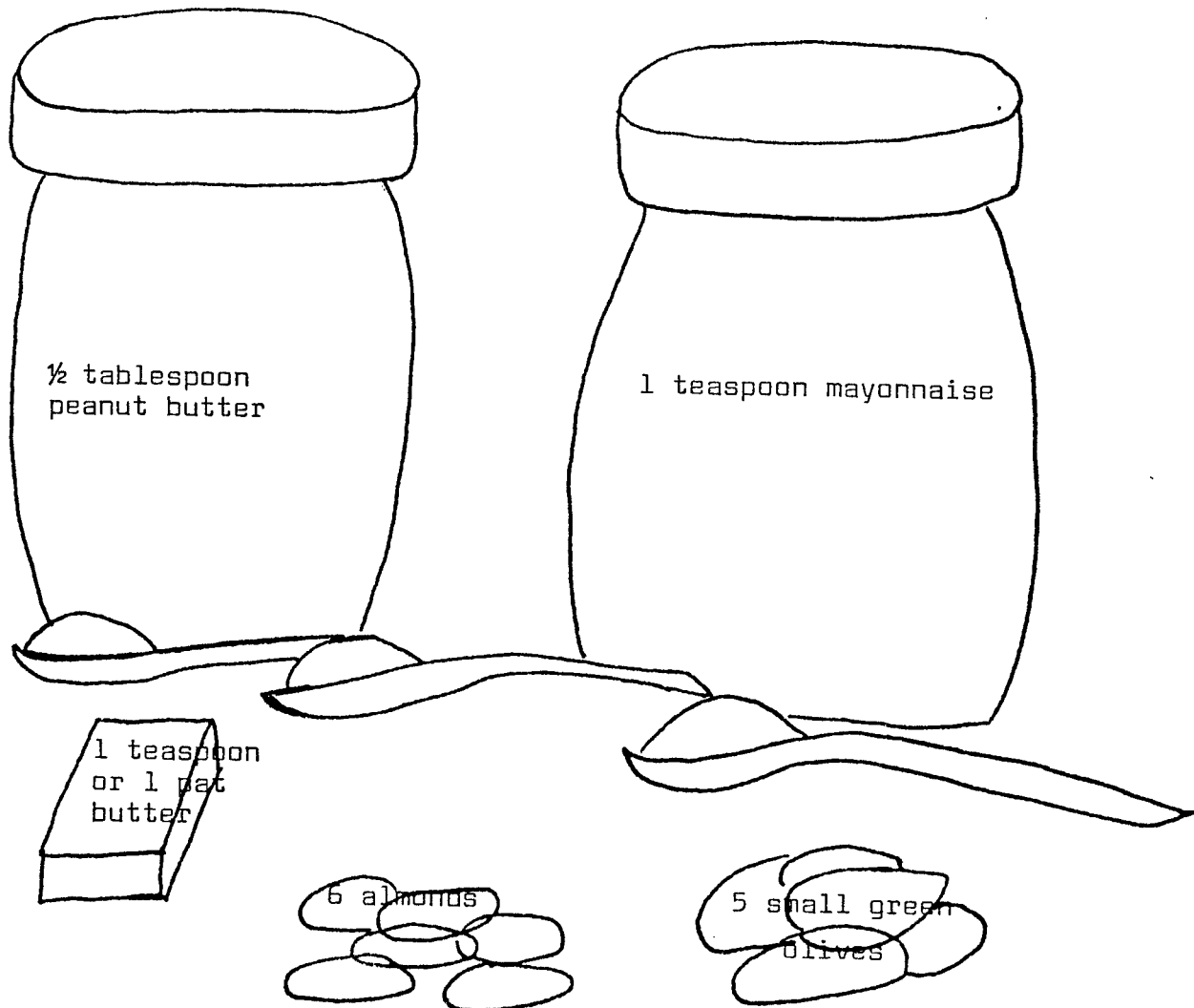
SLIDE 19Meat Exchanges

REVIEW the meats shown in this slide with the patients. HELP them to locate each in their "Meal Planning" booklet. EMPHASIZE that any of these meat products in the amount shown is equal to one meat exchange.



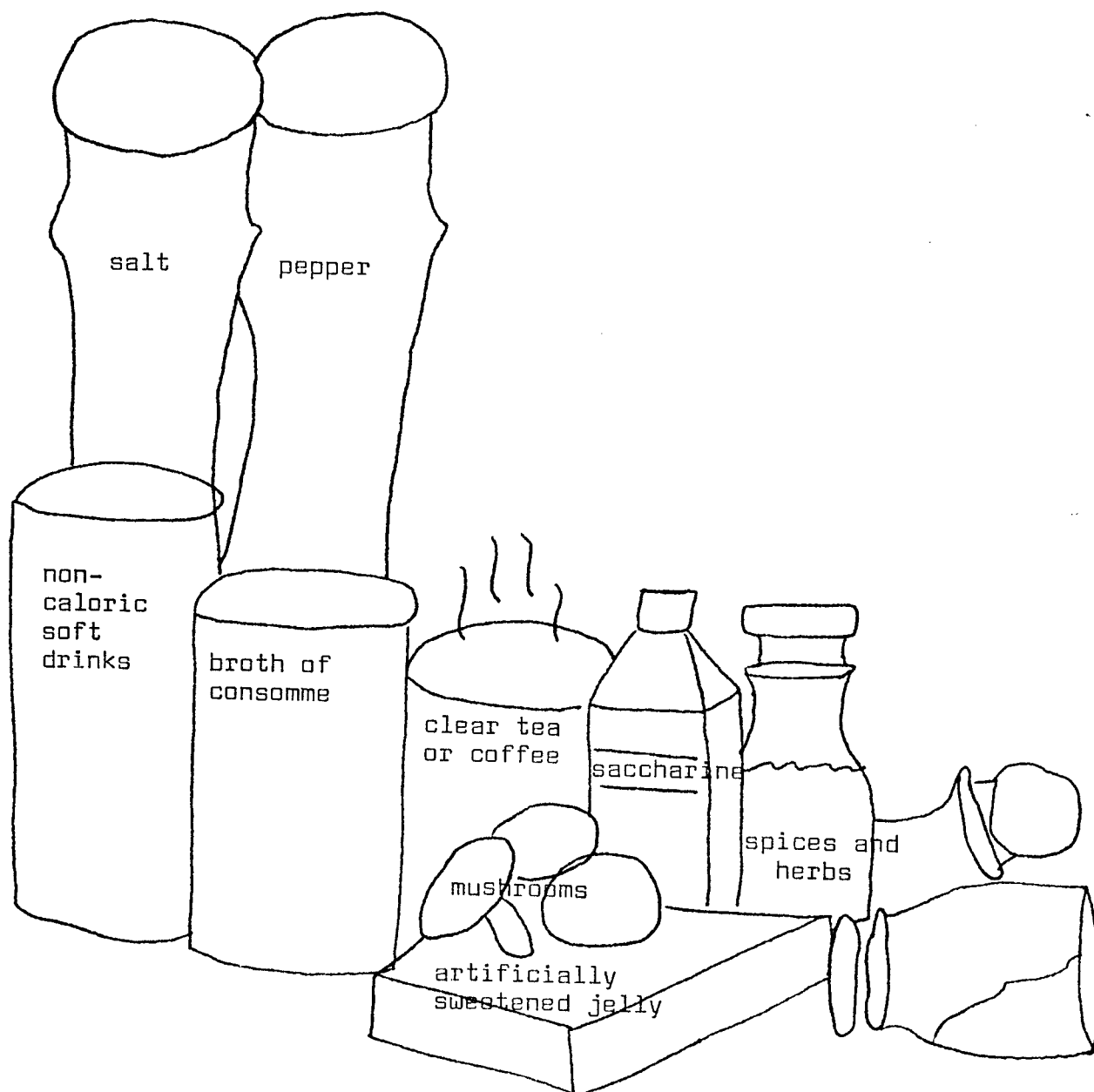
SLIDE 20Fat Exchanges

REVIEW the fat exchanges shown in this slide with the patients. HELP them to locate each in their "Meal Planning" booklet. EMPHASIZE that any of these fat products in the amount shown is equal to one fat exchange.



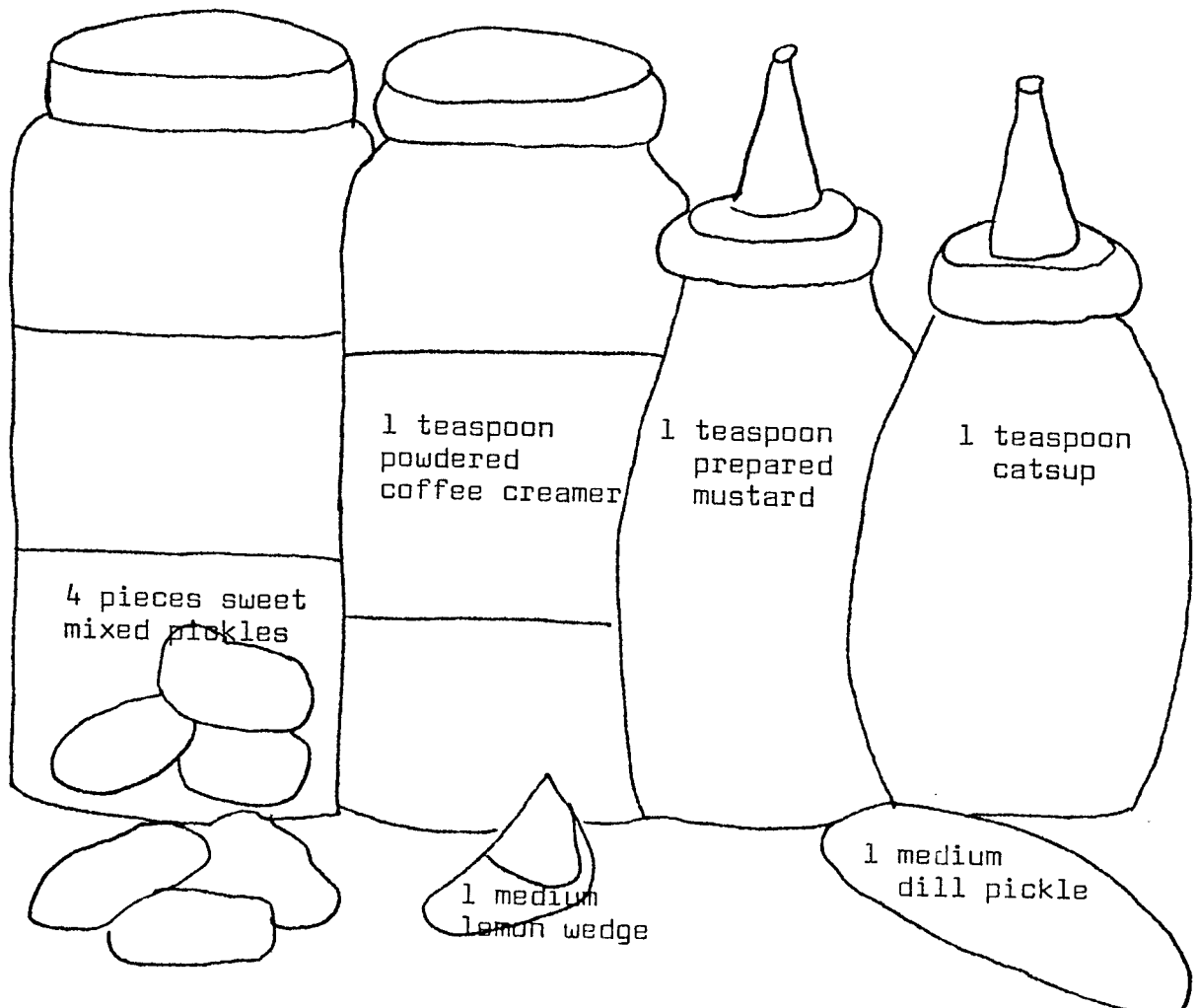
SLIDE 21Calorie Free Foods

REVIEW the foods shown in this slide with the patients.
HELP them to locate each in their "Meal Planning" booklet.
EMPHASIZE that any of these foods may be used as desired to add
zest to the diet.



SLIDE 22Calorie Poor Foods

REVIEW the foods shown in this slide with the patients.
HELP them to locate each in their "Meal Planning" booklet.
EMPHASIZE that they may choose two measured servings of these foods
each day in addition to their diet.



SLIDE 23There Aren't Many Foods You Can't Have

Explain;

When you have had a good look at all of the foods on the Canadian Diabetic Exchange Lists, you will realize that there really are not many foods which you may not have. These foods are not on the Exchange Lists because they have too much pure sugar in them. You should not eat any of the following foods, except on the advice of your doctor:

sugar	honey	pie	sweetened condensed
candy	jam	cake	milk
	jelly	cookies	chewing gum
	preserves		regular soft
	syrup		drinks
	marmalade		

For exceptions to this advice, plus seasonings and free foods which will add zest to your diet, see pages 19 and 20 of your "Meal Planning" booklet."

GIVE each patient the sheet titled "There Aren't Many Foods That You Can't Have" for his Take-home folder.

(Nurse's Instructions)

SLIDE 24Questions re Diet

DISCUSS the following information which may be of concern to the patients:

1. Food Shopping

It is not necessary to buy special foods because you have diabetes. You can eat the same food as the rest of your family. When buying canned or frozen foods (especially fruits and fruit juices), look for the words "no sugar added" on the label. You may wish to buy some dietetic foods, such as non-caloric soft drinks or dietetic jam or jelly. Some of these are indeed allowed. But be careful, some artificial sweeteners do contain carbohydrates. Check with your "Meal Planning" booklet or the Canadian Diabetic Association Diet Counselling Service whenever you are in doubt.

2. Liquor

Generally speaking, wine, beer and other alcoholic beverages are not permitted on a diabetic diet. However, if you enjoy a drink, it would be wise to discuss the matter with your doctor. He might show you how to include an occasional drink in your diet plan.

3. Eating Out

There is no reason why having diabetes should stop you from eating out. When you are in a restaurant, ask about the way the food has been cooked. Try to eat plain foods (i.e. those which have not been breaded, fried or cooked in a sauce), since you can judge their exchange value more easily.

If you take a lunch from home, you will find that it is quite easy to prepare. Just follow your meal plan, and choose exchanges which may be wrapped and carried easily.

4. Entertaining

A diabetic diet is a healthy and tasty diet. There is no reason why you shouldn't cook the same foods for your guests as you would for yourself. If you wish to add extra fat or flour to a given dish, simply remove your own portion before you do so.

5. Illness

If you are nauseated or vomiting, or if you have diarrhea or a poor appetite, you may not feel like eating your regular diet. If any of these things happen, you should phone your doctor. He may suggest that you convert your meal plan into fluid exchanges. If he does, turn to pages 20 and 21 of your "Meal Planning" booklet for directions.

(Nurse's Instructions)

SLIDE 25Medicine

EXPLAIN:

"Some diabetics can keep their condition in balance by just following their diets. Other diabetics require some sort of medicine in addition to their diets to stay healthy.

Diabetic medicine comes in two forms: - insulin and oral antidiabetic pills.

If a diabetic person's pancreas is making little or no insulin, his doctor may wish him to take insulin. Insulin must be injected beneath the skin because, if it is swallowed, it is destroyed by the digestive juices of the stomach.

If a diabetic person's pancreas is making some insulin, but not enough - or if the insulin it makes is not able to do the job it should - his doctor may wish him to take an oral antidiabetic pill. It is called an "oral" pill because it can be swallowed, and it is called an "antidiabetic" pill because it fights against diabetes.

Some diabetic persons can use the antidiabetic pills; others cannot. Don't try to compare your diabetes with that of other people! Each diabetic patient needs special study and care. After careful study, your doctor has decided which medicine you need to care for your diabetes. Follow his advice!"

GIVE each patient the sheet titled "Medicine" for his "Take-home folder".

(Nurse's Instructions)

SLIDE 26Antidiabetic Pills

EXPLAIN:

"Your doctor has decided that your diabetes will be kept in its best balance if you take an antidiabetic pill in addition to following your diet."

HELP each patient to locate his antidiabetic pill among those illustrated on the slide. Then point out the information which applies to him from that given below.

NAME	STRENGTH	MODE OF ACTION
<u>Group I (Sulfonylureas)</u>		
- Orinase (tolbutamide)	500 mg	Helps the pancreas to make more insulin.
- Mobenal (tolbutamide)	500 mg	
- Genarex (tolbutamide)	500 mg	
- Diabinese (chlorpropamide)	250 mg	
- Chloronase (chlorpropamide)	100 or 250 mg	
- Dimelor	500 mg	
<u>Group II (Biguanides)</u>		
- Dia Beta	5 mg	Helps the body use its insulin more effectively.
- DBI (phenformin)	25 mg	
- DBI-TD	50 mg	

EXPLAIN:

"It is most important that you take only this antidiabetic drug, and that you follow your doctor's instructions for taking it exactly. If you do this, your good health balance will stay even. If you don't, the balance will tip, and you may run into serious problems.

Although your diabetes is well managed with your antidiabetic pill, there may be some few times when you will have to take insulin as well. When your body needs more insulin than it can make (even with the help of your pill) - such as when you are sick, when you have a bad infection, or when you have an operation - this extra insulin may need to be supplied from outside your body by an injection. Should you need such an injection at home, your doctor will be able to arrange for it to be given by a visiting nurse.

(NOTE: - As with all kinds of medicine, antidiabetic pills may cause unpleasant side effects in some people. These are very rare. However, should you have any nausea, vomiting, loss of appetite or any other such symptom, report it to your doctor immediately.)"

SLIDE 26 (cont'd)

GIVE each patient the sheet titled "Antidiabetic Pills" for his Take-home folder.

BE SURE that each patient knows the 1. name; 2. strength; 3. dose; 4. administration times, and 5. mode of action for his own drug. ASSIST him to fill in this information on the sheet provided.

DO NOT give this information to insulin users.

(Nurse's Instructions)

SLIDE 27Insulins

EXPLAIN:

"Your doctor has decided that your diabetes will be kept in its best balance if you take insulin as well as following your diet. Insulin helps you manage your diabetes by making it easier for sugar to get from your blood into the cells, where it can be burned for energy."

HELP each patient to locate his insulin among those illustrated on the slide. Then point out the information which applies to him from that given below.

Action	Name	Time of Strongest Effect
Rapid (fast acting)	- Regular (Toronto) - Semilente	just before lunch
Medium acting	- N.P.H. - Globin - Lente	just before supper
Prolonged (slow) acting	- P.Z.I. - Ultralente	during the night

ASSIST the patient to identify which strength of insulin he is to use (U40 or U80). EXPLAIN that this type of measurement of strength means that there are 40 or 80 little bits of insulin in one c.c. (one syringe). Point out that the strength of the insulin is always indicated by the colour of the print on the label - red for U40 and green for U80.

EXPLAIN:

"It is most important that you take only this kind of insulin, and that you follow your doctor's instructions for taking it exactly. If you do this, your good health balance will stay even. If you don't the balance will tip, and you may run into serious problems."

GIVE each patient the sheet titled "Insulins" for his Take-home folder.

BE SURE that each patient knows the 1. name, 2. strength, 3. dose, 4. administration time(s), 5. mode of action, and 6. time of strongest effect for his insulin. ASSIST them to fill in their information on the sheet provided.

DO NOT give this information to antidiabetic pill users.

(Nurse's Instructions)

SLIDE 28Equipment

EXPLAIN:

"There is certain equipment which you will need to give your insulin injections. It would probably be a good idea to keep all of this equipment together in one place (such as on a tray or in a special cupboard). Here are the things you will need:

1. Syringes:

You should buy U _____ syringes. It is important for you to have this size, because that is the strength of insulin you will be using. Your U _____ syringes will have _____ coloured markings on them.

You may wish to use either glass or plastic disposable (throw-away) syringes. If you choose glass, you should buy at least 2 syringes (to allow for sterilizing and breakage). If you choose disposables, buy them by the dozen, as they are less expensive that way. Glass syringes are somewhat less expensive than the disposable ones, but glass must be boiled or soaked in alcohol to make it safe (sterile) for use.

2. Needles:

You should buy _____ gauge, _____ inch long needles. This is the size that the doctor feels is best for you to use.

Here again, you may choose from 2 types of needles: metal hub, reusable or plastic hub disposable. If you choose reusable needles, you should buy at least two. If you choose disposables, buy them in quantity. Disposable needles have the advantages of being sharper and not needing sterilization.

3. Insulin:

You should use the kind and strength of insulin which we discussed on the last page. It is wise to always have at least 2 bottles of insulin on hand - the one you are using, and an extra.

Each insulin bottle is marked with an expiry date. It is not safe to use that insulin after the date given. If the bottle expires before it is opened, return it to your drug store. If it expires once you have started using it, throw it away.

You may store the bottle of insulin which you are using at room temperature. Extra bottles should be kept in the refrigerator. Don't store your insulin in the freezer! The extreme cold reduces its effectiveness.

SLIDE 28 (cont'd)4. Alcohol:

You will need alcohol for cleaning your skin and some of your injecting equipment. You should buy 70% isopropyl alcohol for this purpose. Store your alcohol in a covered glass container, as it evaporates very quickly if left uncovered.

5. Cotton:

Absorbent cotton will be needed to apply the alcohol to your skin. Either bulk cotton or cotton balls will serve this purpose well. Store your cotton in a clean covered container.

SHOW the patients as much of this equipment as possible. Point out the names of the various parts of the syringe and needle. Discuss which parts they may and may not touch. Encourage them to handle the equipment and to ask questions about anything that puzzles them.

GIVE each patient the sheet titled "Equipment" for his Take-home folder. ASSIST them by filling in the blanks provided. If the doctor has not specified a needle size for the patient, you could suggest 25 gauge 1/2" or 5/8". If they do not know the size of syringe to use, suggest that they have it completed by the ward staff before they are discharged.

SLIDE 29Preparing Your Insulin

EXPLAIN:

"Here are the nine steps to follow in preparing your insulin injection:

1. Wash your hands.
2. Mix your insulin, if necessary, by rolling the bottle between your hands.
3. Moisten some cotton with alcohol.
4. Clean off the top of your insulin bottle with the alcohol-soaked cotton.
5. Remove any alcohol or water that may be in your syringe if you are using a glass syringe.
6. Draw the right amount of air into the syringe.
7. Push the needle through the rubber top of the insulin bottle.
8. Push the air into the insulin bottle.
9. Pull the plunger back to withdraw the correct amount of insulin. Check for air bubbles in the syringe, and if there are none, pull the needle out of the insulin bottle.

Throughout the preparation and giving of your insulin it is important to keep from touching the following:

- (a) the stem of the plunger,
- (b) the top of the syringe,
- (c) the point of the needle,
- (d) the top of the insulin bottle."

DEMONSTRATE the above nine steps to the patients.

HAVE THE PATIENTS RETURN THE DEMONSTRATION. Encourage them to identify each step as they do it.

LEAVE the injection equipment with the patients so that they may continue to practice the procedure. This will be checked by the ward staff.

GIVE each patient the sheet titled "Preparing Your Insulin" for his Take-home folder.

IF any patient will be using a mixture of two insulins, follow the same steps as above, but use the sheet titled "Preparing Your Insulin Mixture" for the steps in preparation. GIVE the patient this sheet for his Take-home folder.

(Nurse's Instructions)

SLIDE 30Giving Your Insulin

EXPLAIN:

"Once you have prepared your insulin, most of the work is done. There are only six steps left to finish giving your insulin.

1. Clean the skin at the injection site with alcohol-soaked cotton.
2. Pinch up a large area of skin.
3. Insert the needle quickly into the skin at 60 to 90 degree angle.
4. Remove the hand that was pinching the skin. Using that hand, pull back on the plunger to be sure that the needle is not in a blood vessel. (If blood should come back into your syringe, you must discard that insulin and begin all over again.)
5. Push the plunger in slowly to inject the insulin.
6. Remove the needle quickly at the same angle that it was inserted, bracing your skin with a clean piece of cotton."

POINT OUT the above six steps to the patients and DEMONSTRATE the procedure to them. Encourage the patients to identify each step as you are doing it.

EXPLAIN the following:

"Insulin should always be injected to reach the loose space under your skin between your fat and your muscle. If you inject your insulin too close to the surface, it may go into the fat or the skin and cause a painful stretching and swelling. In time, this may lead to shrinkage of the skin and fat, causing 'hollows'."

"These lumps prevent your insulin from being absorbed by your body at the proper speed. Although it may hurt less to give your injections in these places, you should not do so! Rotate the site of your injections through as many as possible of the areas shown at left. A chart may be helpful in doing this. You should never give two injections closer than one inch apart in the same month!"

LEAVE the injection equipment and an orange with each patient so that they may continue to practice the procedure. GIVE the sheet titled "Giving Your Insulin" for their Take-home folder. The ward staff will observe them simulate the injection until they can perform the procedure safely and accurately.

ENCOURAGE each patient to begin giving his own injection as soon as possible. Once they have mastered this procedure, they should give their own injection every day to REINFORCE this learning.

(NOTE: if any patient is unable to overcome the psychological barrier of actually passing the needle through his skin, a Busher Automatic Injector may be recommended.)

(Nurse's Instructions)

SLIDE 31Care of Your Equipment - Daily Care with Alcohol

EXPLAIN:

"It is important that you keep your injection equipment sterile (germ-free), in order that it be safe for you to use. This may be done in two ways:

. 1. Daily Care with Alcohol

Alcohol is quite sufficient to keep your injection equipment sterile between weekly boilings. Here's how to use it:

- (a) Pour 70% isopropyl alcohol into a clean covered container or a "steri-tube" (a special tube in a stand which you can buy at your drug store).
- (b) Draw enough alcohol into your syringe to fill it. Squirt it out. Repeat 2 or 3 times.
- (c) Put your syringe into the container. It should be covered with alcohol. Place the lid on the container.
- (d) Leave your syringe in the alcohol until you are ready to use it again. (It must have been soaking in the alcohol at least 20 minutes to be sterile.)
- (e) You will find that after many uses, the alcohol in your container will have evaporated or become discoloured. If it evaporates, just add some more (there should always be enough to cover your equipment). If it becomes discoloured, throw it away and get some fresh alcohol."

GIVE each patient the sheets titled "Care of your Equipment" for his Take-home folder.

(Nurse's Instructions)

SLIDE 32Weekly Care - Boil in Water

EXPLAIN:

"To be very sure that your injecting equipment is absolutely sterile, you should boil it in water once a week. The steps for doing this are quite easy:

(a) Take your syringe apart. Put the parts into a large strainer.

(b) Put the strainer in a pot of boiling water. Be sure that the water covers the equipment.

(c) Boil 10 minutes.

(d) Pick up the strainer, hold it and pour the water out of the pan. Put the strainer back into the pan until everything has cooled.

(e) To reassemble your syringe:

i. Pick up the outside part of the syringe (the 'barrel') with one hand.

ii. With the other hand grasp the handle end of the plunger.

iii. Without touching any other part, slide the plunger into the barrel to put the syringe together.

(f) Wrap your equipment in a freshly ironed piece of cloth, or return it to the alcohol container - so it stays sterile until you are ready to use it.

(g) You will find that your syringe will become cloudy after many boilings. To get rid of this either soak it in vinegar or boil it in vinegar and water before sterilizing.

(NOTE: If you have re-usable needles, they too must be sterilized. Treat them exactly the same as your syringe, i.e. soak in alcohol every day and boil once a week. To put re-usable needles onto the syringe: - pick up the big part of the needle (the "hub"); put the needle onto the syringe and turn to tighten. Do not touch the point of the needle or the tip of the syringe!)"

(Nurse's Instructions)

SLIDES 33 and 34Exercise

EXPLAIN:

"Exercise is good for everyone. It helps keep weight down, muscles strong and blood flowing properly. In short - it helps people stay healthy. This is especially true for diabetics.

If you will think back to the good-health balance you will remember that exercise, as well as diet, has an effect on the balance of sugar and insulin in the body. All the physical activities (such as walking, swimming, gardening) are kinds of exercise. And all exercise burns up sugar.

Your doctor has planned your diet to give you the amount of food you need to do the activities you usually do. He has planned your medicine to see that you have just enough insulin to use up the sugar in your blood for energy. Therefore, to keep your good-health balance even, you should do about the same amount of exercise every day. The kind of exercise is not nearly as important as the amount. You can do just about anything you please - provided that you do it every day. If you do more exercise than usual, it may result in too little sugar in your blood. If you do less exercise than usual, it may result in too much sugar in your blood. Neither one of these conditions is good, because both of them upset your good-health balance.

So, plan your activities so that you do about the same amount of activity every day. (For example, if you walk to work on weekdays, take a walk on weekends too.) If, for some reason, your activity has to be more or less than normal (such as working overtime, planning an active vacation, or staying in bed with a cold), get in touch with your doctor. He will tell you how to change your diet and/or medicine to meet this change."

GIVE each patient the sheet, titled "Exercise" for his Take-home folder.

(Nurse's Instructions)

SLIDE 35Personal Hygiene

EXPLAIN:

"In managing your diabetes, personal hygiene is very important. The illustrations on the slide show five aspects of hygiene that you should learn.

1. About your teeth and gums:

All of the things we have talked about so far (diet, medicine and exercise) are aimed at keeping the sugar and insulin in your blood in balance. Infection is another thing which can tip this good-health balance. Cuts and scratches are one source of infection; bad teeth and gums are another. So take good care of your teeth and gums, by brushing after meals and having regular check-ups by your dentist. Be sure to tell your dentist that you are diabetic.

2. About smoking:

In diabetes blood circulation may be lessened. The chemicals that get into your system when you smoke tend to make your blood vessels contract (or tighten). This interferes with your blood circulation even more. Whether or not you may smoke (and if so, how much) is something you should talk to your doctor about.

3 and 4. About your hands and feet:

In diabetes, the blood supply is often decreased (lessened) to the extremities, especially the legs and feet. This means that foot injuries may start more easily, and be harder to heal. It also means that you may not be able to feel heat, cold or sharp objects that may damage your feet. These simple rules will help you avoid trouble with your feet:

(a) Wash your feet daily with a soft cloth and warm soapy water. Dry them thoroughly. If your skin tends to be rough or dry, apply a gentle skin cream (such as lanolin). If your skin tends to be moist or sweaty, apply talcum powder. Check with your doctor before using special creams, salves or powders on your skin.

(b) Wear shoes that fit and are comfortable. Break new shoes in slowly by wearing them a few hours each day at first.

(c) Don't wear round garters, socks or stockings that are too tight, or anything else that interferes with the blood supply to your legs and feet. Put on clean socks or stockings every day.

(d) Never go barefoot.

SLIDE 35 (cont'd)

(e) Cut your toenails (and fingernails too, for that matter) after you bathe - when they are soft. Cut straight across the nail, (not too short!) and don't dig into the corners.

(f) Don't try to cut corns and callouses by yourself. Get them treated by your doctor.

(g) If your feet are cold at night, wear clean socks to bed. Never use a heating pad or hot water bottle because these may cause burns on your feet.

(h) Check your feet carefully every day, and report any skin changes which do not go away to your doctor.

5. General Cleanliness:

Keep your skin and hair clean with regular bathing. Use luke-warm (never hot!) water and mild soaps and shampoos. Dry yourself gently with a soft towel.

Treat minor cuts and scrapes as follows: - wash with warm, soapy water and put on a clean bandage. Never put iodine on cuts, as it could burn your skin. If cuts, scrapes or bruises do not heal in a reasonable time, tell your doctor.

GIVE each patient the sheet titled "Personal Hygiene" for his Take-home folder.

(Nurse's Instructions)

SLIDE 36Urine Testing

EXPLAIN:

"One of the most accurate ways of checking that your good-health balance is even -- rather than tipped to one side or the other -- is by testing your urine. Your urine test results will tell the doctor whether all the things you are doing to manage your diabetes are working O.K. Based on the results of your tests, he may make a change in your diet, medicine or exercise which will help you feel better and keep a better balance.

You should know how to make two tests on your urine: One for sugar and one for acetone. Whichever urine test you are making, you should always use a "double-voided" specimen of urine. Here's how to get one:

- (a) About ½ hour before your time to test, urinate as much as you can. Don't save any of this urine.
- (b) Drink a glass of water and wait about ½ hour.
- (c) Urinate again and use this specimen for testing. (This second urine is called a "double-voided" specimen).

You will be given detailed instructions for one sugar and one acetone test. There are many other tests for urine sugar and acetone available. If you wish to use these, discuss the matter with your doctor. If he approves, be sure to read and follow the package directions carefully. This is essential if your test is to be accurate."

(Nurse's Instructions)

SLIDE 37Urine Testing - For Sugar

EXPLAIN:

"If you eat more food than is allowed, forget to take your medicine or do less exercise than usual, sugar will build up in your blood. (The same thing may happen if you are very upset about something or if you have an infection. As the amount of sugar in the blood builds up, some of it will overflow into your urine. An unusual amount of sugar in the urine is a sure sign that your good-health balance is tipped.

One of the most accurate means of testing your urine for sugar is with Clinitest tablets. Here's how:

1. Collect your urine in a clean container. With the dropper in an upright position place 5 drops of urine in the test tube.
2. Rinse the dropper and add 10 drops of water.
3. Drop one Clinitest tablet into the test tube (be careful not to touch it with damp fingers). Watch while the complete reaction takes place.
4. Do not shake the tube during the reaction nor for 15 seconds after the boiling has stopped.
5. After the 15-second waiting period, shake the test tube gently and compare it with the colour chart.

NOTE: Careful observation of the solution in the test tube while reaction takes place and during the 15-second waiting period is necessary to detect rapid "pass through" colour changes caused by amounts of sugar over 2%. Should the colour rapidly "pass through" green, tan and orange to a dark greenish-brown, record as over 2% sugar without comparing final colour development with colour chart."

DEMONSTRATE Clinitest procedure to the patients. Encourage them to participate in identifying each step as you are doing it.

HAVE THE PATIENTS RETURN THE DEMONSTRATION, identifying the steps as they do so.

(Nurse's Instructions)

SLIDE 38Urine Testing - for Acetone

EXPLAIN:

"Generally speaking, your body uses sugar for energy. However, it can also get energy from fat. When your cells are not getting enough sugar to provide the energy they need, your body breaks down its own fat for energy. This process makes a substance called acetone, which will spill over into your urine in the same way that sugar does when it gets too high.

Moderate amounts of acetone in your blood will cause nausea, vomiting, flushed and dry skin, sleepiness and deep rapid breathing. Large amounts of acetone cause unconsciousness. So you can see that it is important to know when you are building up acetone. The way to do this is by testing.

One simple and accurate test for acetone can be done with Acetest tablets. Just follow these steps:

1. Collect your urine in a clean container. Place one Acetest tablet on a clean piece of white paper.
2. Put one drop of urine on the tablet.
3. Wait 30 seconds.
4. Compare the colour of the tablet with the colour chart."

DEMONSTRATE Acetest procedure to the patients. Encourage them to participate in identifying each step as you are doing it.

HAVE THE PATIENT RETURN THE DEMONSTRATION, identifying the steps as he does so.

ENCOURAGE the patients to begin doing all of their own urine tests as soon as possible. They may need supervision at first, but once they have mastered the procedure, they should be able to take the responsibility for testing and reporting the results on their own.

GIVE each patient the sheets titled "Urine Testing" for his Take-home folder. FILL IN the urine testing times on these sheets in the spaces provided.

EXPLAIN:

If your urine tests greater than 1% for sugar on several tests in a row OR if you get a positive acetone test, notify your doctor.

(Nurse's Instructions)

SLIDE 39Keep A Record

EXPLAIN:

"In order for your doctor to get an overall picture of how well balanced your diabetes is, he will have to have an on-going record of your urine tests. Such a record is easy to keep."

REVIEW the sample record with the patients. Be sure they understand what and how to record in each column.

(Nurse's Instructions)

SLIDE 40Problems

EXPLAIN:

"As we have said, you will usually be able to keep the sugar and insulin in your blood in balance by following your doctor's orders about diet and medicine, and by getting the same amount of exercise every day. There are, however, some other things -- things you can't help -- which may tip your good health balance. Some of these things are illness, infection, and severe emotional upset.

Whenever one of these things happens to you, or whenever you "cheat" on your diet, medicine or exercise, you are in danger of developing a problem with your diabetes. It is important that you should be aware of these problems (what causes them and how to know you have them) so that you can treat them when they occur and avoid them in the future."

(Nurse's Instructions)

SLIDE 41Diabetic Coma

EXPLAIN:

"Diabetic coma is the problem which results when your sugar-insulin balance is tipped to the sugar side. As we mentioned when we were discussing urine testing, your body can make energy from fat as well as sugar. It does this when there's not enough insulin around to use your blood sugar in the way it ordinarily should. When your body burns fat for energy, it produces fatty acids like acetone. Too much acetone is bad for your body. It causes a condition called acidosis, which can lead to a diabetic coma. You may hear diabetic coma called other names, such as "diabetic acidosis", "diabetic ketosis", or "hyperglycemia" (which means extra blood sugar). Whatever name you use, it is important to remember that diabetic coma is a very serious diabetic problem!

There are several things which might cause you to have a diabetic coma. Here are the most usual causes:

- (a) eating too much food;
- (b) not taking enough diabetes medicine (that is, less insulin or antidiabetic pill than you are supposed to);
- (c) taking much less than your usual amount of exercise;
- (d) a fever or an infection;
- (e) a severe emotional upset."

(Nurse's Instructions)

SLIDE 42Symptoms (of Diabetic Coma)

EXPLAIN:

"How will you know if you are going into a diabetic coma?
Here are some of the most common symptoms:

- (a) dry skin and tongue;
- (b) severe thirst;
- (c) weakness, drowsiness or tiredness;
- (d) nausea, vomiting or loss of appetite;
- (e) deep rapid breathing and a "fruity" smelling breath."

(Nurse's Instructions)

SLIDE 43

What To Do (for Diabetic Coma)

EXPLAIN:

"Here's what to do if you feel you might be going into a diabetic coma:

(a) Test your urine: it will probably be 2% or greater for sugar and positive for acetone.

(b) Phone the doctor: tell him how you feel and what your urine tests said. He will tell you what to do next.

How can you keep from having a diabetic coma? Here are some useful suggestions:

(a) Follow your diet carefully -- never omit foods or meals and never take more than you should.

(b) Never skip your diabetic medicine. Always measure it carefully and take it right on time.

(c) Do the same amount of exercise every day.

(d) Avoid infections and emotionally upsetting situations whenever you can.

(e) Test your urine regularly and report high sugars to your doctor."

GIVE each patient the sheet titled "Diabetic Coma" for his Take-home folder.

(Nurse's Instructions)

SLIDE 44Insulin Shock

EXPLAIN:

"Insulin reaction is the problem which results when your sugar-insulin balance is tipped to the insulin side. That is, you have either too much insulin or not enough sugar in your blood. Other names for insulin shock are "insulin reaction" and "hypoglycemia" (meaning not enough blood sugar).

When your sugar-insulin balance is tipped to the insulin side, the result is that your blood has more insulin in it than it has sugar for the insulin to work on. This state of affairs is quite harmful for your body. Thus, insulin shock is a serious diabetic problem, and one which must be dealt with at once!

There are several things which might cause you to go into insulin shock. Here are the most usual causes:

- (a) not eating enough food (e.g. delaying or skipping meals, or leaving out foods you are supposed to eat);
- (b) taking more than the correct amount of diabetes medicine;
- (c) taking more than the usual amount of daily exercise."

(Nurse's Instructions)

SLIDE 45Symptoms (of Insulin Shock)

EXPLAIN:

"How will you know you are going into insulin shock?
Here are some of the most common warning signs and symptoms:

- (a) feeling nervous, excited, faint or irritable;
- (b) sweating;
- (c) hunger;
- (d) headache;
- (e) trembling;
- (f) trouble seeing clearly."

(Nurse's Instructions)

SLIDE 46What To Do (for Insulin Shock)

EXPLAIN:

"Although insulin shock is a serious problem, it is a very easy one to treat. Here's what to do if you are feeling the symptoms of insulin shock:

(a) Eat or drink something immediately. (If you have something sweet right on hand, take it. If not, don't waste time looking for sweets; just eat something!

(b) Wait 15 minutes.

(c) THEN - if you don't feel better - eat or drink some more and phone the doctor. He will tell you what to do next.

How can you keep from having insulin reactions? Follow these suggestions:

(a) Never skip or delay your meals. Always eat exactly what your meal plan says, at the time it says.

(b) Always measure your diabetic medicine carefully and take it on time.

(c) Eat or drink something extra beforehand if you know you are going to do more exercise than usual, OR if there wasn't time for that, eat or drink something immediately afterwards.

(d) Always carry something sweet with you."

GIVE each patient the sheet titled "Insulin Shock" for his Take-home folder.

(Nurse's Instructions)

SLIDE 47Infection

EXPLAIN:

"As we mentioned in our discussion of diabetic coma, an infection is one of the things which may cause you to go into a diabetic coma. This is because the fever that comes with many infections acts to tip the sugar-insulin balance toward the sugar side. Thus, if you have an infection (such as a severe cold or the flu), you should be on the lookout for the symptoms of a diabetic coma. In addition to those warning signs, if you take your temperature you will find that it is above normal."

(Nurse's Instructions)

SLIDE 48What To Do (for Infection)

EXPLAIN:

"Because an infection has much the same effect on your body as a diabetic coma, you would expect to treat it the same way -- and you do!

(a) Test your urine (once again, it will probably be positive for both sugar and acetone).

(b) Phone your doctor. Tell him how you feel, what your temperature is, and what your urine tests said. He will give you specific instructions about your diabetes medicine and diet.

(c) Go to bed -- you'll need rest to allow your body to fight that infection.

Now that you know that infections can be serious problems for you, you'll want to avoid them whenever you can. Here are some hints for doing just that:

(a) Stay away from people who you know already have infections of one sort or another.

(b) Follow the rules we discussed under "Personal Hygiene".

(c) Treat simple injuries right away so that they don't have a chance to become infected."

GIVE each patient the sheet titled "Infection" for his Take-home folder.

(Nurse's Instructions)

SLIDE 49Protect Yourself

EXPLAIN:

"There are two very simple things you should do to protect yourself:

1. Wear and/or Carry Identification

Both diabetic coma and insulin shock are serious problems which call for quick treatment. When they are severe, the diabetic person can faint. That's why it's very important to wear or carry diabetic identification. This identification will help you get the treatment you need quickly. Medic Alert is one very good source of diabetic identification. There are others. Talk to your doctor about which kind of identification you should use.

2. Carry Something Sweet

Insulin shock may come on very suddenly -- almost without warning. When it does, you want to be able to treat it promptly. That is why it would be wise for you to get into the habit of always carrying something sweet (like candy) in your pocket or purse."

(Nurse's Instructions)

SLIDE 50Where to Get Help

EXPLAIN:

"There are many people and organizations who are ready to help you keep your good-health balance even. Here's a quick reference of who they are and what they will do for you.

SOURCE	WHAT THEY CAN DO FOR YOU
1. Doctor <u>(phone number)</u>	1. Get you started with a good balance of diet, exercise and diabetes medicine. 2. Change this plan if it isn't working for you. 3. Advise you what to do when your good-health balance is in danger of tipping.
2. The Canadian Diabetic Association <u>(branch phone number)</u>	<p>The Canadian Diabetic Association is a non-profit organization dedicated to helping diabetics live a fuller and healthier life. You may join the C.D.A. through the national office or any one of its local branches. The benefits of membership in the C.D.A. broadly include:</p> <ol style="list-style-type: none"> 1. <u>Services</u>. Free diet counselling and operation of holiday camps which provide regulated diets for children and adults are some of the services you can enjoy as a member of C.D.A. 2. <u>Education</u>. At every local C.D.A. meeting, part of the program is devoted to either demonstrations by doctors and dieticians, lectures, open forums, or instructive films designed to help you and your family live a better and more normal life. 3. <u>"The Newsletter"</u>. The C.D.A. publication "The Newsletter" is mailed to all members four times a year. Information and prices on other publications on diabetes are available from the national office. 4. <u>Encouragement</u>. You and your fellow members of the C.D.A. have common problems and objectives. In group meetings you have the opportunity of seeing how others have overcome certain difficulties. Then, too, you may be able to help someone. Many have found encouragement and benefited by participating in these meetings.

SLIDE 50 (cont'd)

SOURCE	WHAT THEY CAN DO FOR YOU
3. Public Health <u>or</u> Victorian Order of Nurses visit- ing nurses.	1. Do home teaching. 2. Give insulin injections at home. 3. Help with your food care if you can't manage it alone.
(phone numbers)	
4. Dial-a-Dietician	Various provincial dietietic associations have organized Dial-a-Dietician programs to answer the questions about food and nutrition which arise in day-to-day living. Information is available on such topics as:
(phone number)	<ul style="list-style-type: none"> - everyday nutrition - foods and food values - budgeting and purchasing - meal planning and preparation - food additives - labelling - food fads and fallacies - therapeutic diet modifications <p>If you have questions about any of these subjects, you should call the Dial-a- Dietician number. Your questions will be recorded, and a professional dietician will call you back - within 48 hours - with the answers."</p>

GIVE each patient the sheet titled "Where to Get Help" for
his Take-home folder.

SLIDE 51

(Nurse's Instructions)

PATIENT'S INSTRUCTIONS FOR HANDOUT



and diabetes

Introduction

Diabetes is not an illness. You didn't "catch it", and when you care for it properly, it won't stop you from enjoying life.

Diabetes cannot be cared for by your doctor alone. Indeed, your doctor is depending on you to learn as much as you can about diabetes, so that you will be able to care for yourself.

There is quite a bit to learn, but it isn't very difficult if you take it one step at a time. To help you do this, this course on diabetes has been divided into five classes:

1. Introduction
2. Diet
3. Medicine
4. Exercise, Hygiene and Urine Testing
5. Problems

Most of the things the nurse will teach you are things that you will do yourself every day at home. Ask her lots of questions to be sure you understand what she is saying. Remember, in the long run, your diabetic care is up to you!

(Patient's Copy)

Food-Energy Cycle

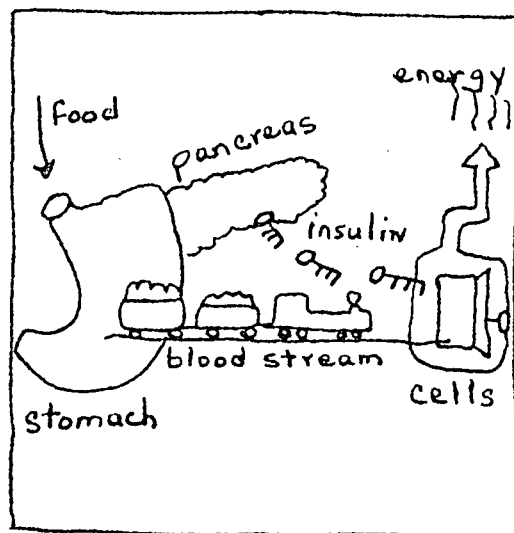
The human body is made up of millions of tiny cells. Therefore, each thing that the body does (working, playing and so on) is really done by a group of cells working together.

Cells need energy in order to work. When everything is working properly in the body, they make that energy by burning fuel which comes from the food one eats.

The body's biggest sources of fuel are sweet and starchy foods such as sugar, bread and cereals. However, other foods (such as meat, fruit and vegetables) can provide fuel too. After these foods are swallowed, the body changes them all to a simple form of sugar. It is this sugar which the cells use as fuel.

Sugar is carried to each cell in the body by the blood stream. In order for the sugar to get inside the cell however, insulin must be present. Insulin is a chemical made by the pancreas (an organ near the stomach). You may think of insulin as the key that opens the cell door to let the sugar in.

As long as one eats the proper foods ... and as long as the body is provided with enough insulin ... the food-energy cycle will work smoothly without any problems.



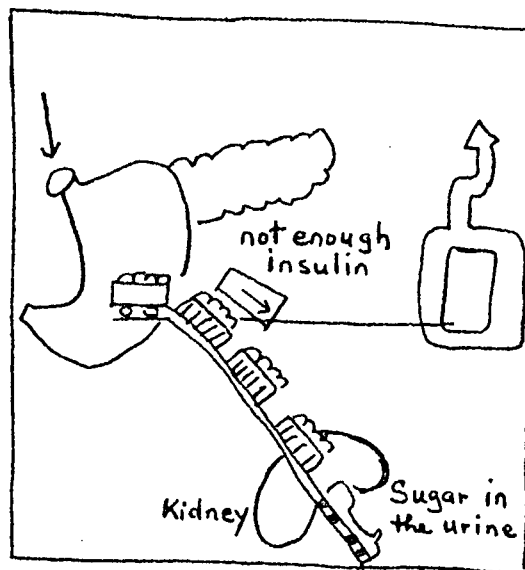
(Patient's Copy)

Diabetic Food-Energy Cycle

As we said, insulin may be thought of as the key that opens the cell door to let sugar in. If your body is short of insulin for some reason, sugar won't be able to get into your cells.

When this happens, the sugar keeps backing up in your blood until it overflows into your urine. It is when this happens that you are found to have diabetes.

Diabetes, then, is a condition in which there isn't enough insulin in the blood to allow your food-energy cycle to work properly.



(Patient's Copy)

Symptoms

What are some of the things that you might have noticed because of your diabetes?

1. Because your body wasn't making enough insulin to allow your food-energy cycle to work properly -- therefore the amount of sugar in your blood rose and spilled over into your urine. Your kidneys had to work overtime to get rid of this sugar -- therefore you likely had to pass large amounts of urine quite often.
2. Because you were losing so much extra water this way, you probably were also very thirsty.
3. Because your body wasn't able to use its sugar-fuel properly, you might have lost weight, no matter how much you ate.
4. Because much of what you did eat was being lost as sugar in your urine, you were probably very hungry.
5. Because your blood sugar was not being changed into energy, you may have felt weak and tired.

When you are taking care of your diabetes properly, you won't have any of these symptoms. They are just your body's way of telling you that something needs to be done.

(Patient's Copy)

One in Every Fifty Canadians

Knowing that you have diabetes may make you feel very lonely or very different from your friends and neighbours. It shouldn't! Diabetes is not an uncommon condition. One out of every 50 Canadians has it, and most of them are leading perfectly normal lives.

Many successful and famous people (businessmen, politicians, athletes, artists and performers) are diabetic. Because they are able to care for their diabetes so easily and so well, it hardly interferes with their lives at all. The same can apply to you!

Diabetes need not change your plans or your way of life. It will mean adding some new habits; but it won't mean missing old pleasures.

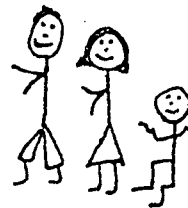
(Patient's Copy)

General Questions

There are probably a few questions that are really worrying you about your diabetes. Let's answer them right now.

1. What about marriage and children?

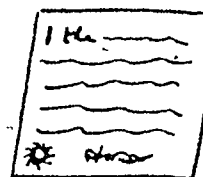
If you are single, diabetes shouldn't change your plans to marry. Because diabetes is so easy to care for, it causes no problems in relation to getting or staying married.



In addition, diabetes in itself is no reason for not having children. Diabetic people can and do have perfectly healthy babies. However, the chance of having a diabetic child does increase if one or both of the parents are diabetic. You would be wise to talk to your doctor some more about this before starting a family.

2. What about life insurance?

Any life insurance policy you had before you developed diabetes will not be cancelled. As for new insurance, many companies today will give life insurance policies to diabetic people who are taking good care of themselves.



3. What about work?

Diabetes should not stop you from working. Indeed, it probably won't even have much effect on the kind of work you can do. People with diabetes are engaged in almost every kind of work you could name (from desk jobs to labour to housework). Studies have shown that they do as well in their work -- in every way -- as do non-diabetics.



4. What about sports and other activities?

Here again, there is no need to give up or to change anything that you enjoy. As a matter of fact, exercise is especially good for the person with diabetes. It helps to burn up sugar.



However, if your exercise pattern is likely to change greatly from one day to the next, you should discuss this with your doctor. He will want to adjust your meals and medicine to take this into account.

(Patient's Copy - for younger patients)

General Questions

There are probably a few questions that are really worrying you about your diabetes. Let's answer them right now.

1. What about marriage and children?

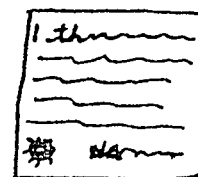
Because diabetes is so easy to care for, it causes no problems in relation to getting or staying married. So put your mind to rest about that!



If you have children however, there is a better than average chance that they will develop diabetes. You should advise them to have a doctor check their blood and urine for sugar regularly.

2. What about life insurance?

Any life insurance policy you had before you developed diabetes will not be cancelled. As for new insurance, many companies today will give life insurance policies to diabetic people who are taking good care of themselves.



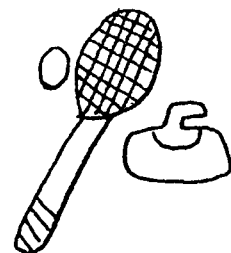
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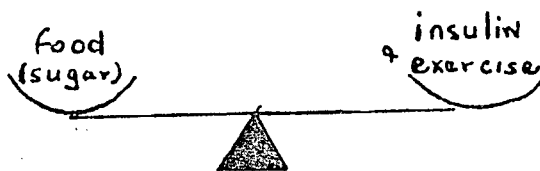


4. What about sports and other activities?

Here again, there is no need to give up or to change anything that you enjoy. As a matter of fact, exercise is especially good for the person with diabetes. It helps to burn up sugar.



(Patient's Copy - for older patients)



Balance = Good Health

You and your doctor share several aims or goals in the care of your diabetes. They are:

1. to get rid of the symptoms of your diabetes (OR if you have had no symptoms, to keep them from showing up);
2. to keep you from getting any complications of diabetes;
3. to keep you healthy; and at the same time
4. to interfere as little as possible with your normal daily life.

Reaching these goals depends upon keeping a careful balance between

1. your food - which provides the sugar in your blood stream; and
2. your insulin and exercise - which help your body to use this sugar for energy.

Tipping the balance to either side will result in problems. Keeping it even will result in good health.

(Patient's Copy)

Diet

You may be asking yourself why it is necessary for diabetics to follow a diet. By seeing to it that you eat the same kind and amount of food each day, you and your doctor are able to keep the sugar in your blood at a safe level.

Most foods can be changed into sugar by the body. However, some foods make more sugar than others. If you eat more food than your body needs, or too much of the wrong kinds of food, it may cause the sugar in your blood to build up. This will tip your good-health balance, and might cause some serious problems. Therefore, it is especially important for you to watch both the kind and the amount of food that you eat.



No two diabetics are exactly alike. So, each diabetic person's diet will be different from that of other diabetics. Only your doctor can work out the right diet for you.

Now there is no need to be discouraged about the idea of diet. You won't have to give up very many foods that you enjoy. You won't have to cook or eat meals different from your family's. You won't have to buy special foods or shop in special stores. You will have to learn a new way of planning your meals -- but this will soon become second nature to you.

(Patient's copy)

Kinds of Food

Your diet plan will call for foods such as milk, meat, vegetables, fruit, bread and cereals. These foods are necessary for good health and should be eaten every day by everyone -- non-diabetics and diabetics alike!

Nearly all foods have some carbohydrate, protein and fat in them. However, the amounts of each will be different in different kinds of foods.

Foods that have more carbohydrate than protein or fat are called carbohydrate foods. Carbohydrate foods are sugars, breads, cereals, fruits and vegetables.

Foods that have more protein than carbohydrate or fat are called protein foods. Protein foods are milk, cheeses, eggs, meats or fish.

Foods that have more fat than carbohydrate or protein are called fat foods. Some fat foods are butter, nuts and bacon.

In planning your diet, your doctor will make sure that you eat some carbohydrates, some proteins and some fats at every meal.

Each of these 3 types of food has a special job to perform:

1. Carbohydrate foods are used by the body in the same way that a car uses gasoline. They are burned by the cells to provide energy. While other foods may also provide energy, carbohydrates do so the fastest. Thus we may say that they are like "premium" gasoline.

2. Protein foods are used by the body for growth, for building muscles and for repairing any body damages, i.e. for "home building and maintenance".

3. Fat foods are also fuel foods. They, like carbohydrates, provide energy for the body. However, they do not act as quickly as carbohydrates -- so they are more like "regular" gasoline. Furthermore, if fats are not needed by the body at the time they are eaten, they may be stored -- sort of like a "spare tank" -- in the form of body fat.

(Patient's Copy)

How the Doctor Plans Your Diet

As we said before, as a diabetic, you will need your own personalized diet. The doctor will take many things into account in planning this diet for you. Here are some of them.

1. Your age

Children, teenagers, pregnant women, and older adults all have special needs which determine the kind and amount of foods they should eat. Your doctor will plan your diet to meet the special needs of your age group.

2. Your weight

If you are overweight, your doctor will give you a diet that will help you to lose weight at first. Once you have reached the correct weight for you, your diet will be changed so that it helps you keep that weight.

3. Sex

Men and women have different food needs. Your doctor will take these into account.

4. Activity

As we said before, exercise causes the body to use up sugar. Therefore, more active people will need more food than will less active ones. If your activity will change greatly from day to day, you may even need more than one diet plan. Talk this over with your doctor.

5. Over-all health

An illness may cause your good-health balance of food, insulin and exercise to tip. Therefore, when you are ill, your doctor will adjust your diet to meet the special needs your body has at that time.

In addition, if you have some other condition besides diabetes, it may have to be considered in your diet plan as well.

(Patient's Copy)

Things You Need to Follow Your Diet

Following your diet on a day-to-day basis involves the use of two things:

1. The meal plan prepared by your doctor or dietician; and
2. The food exchange lists found in the Canadian Diabetic Association booklet "Meal Planning for Diabetics in Canada".

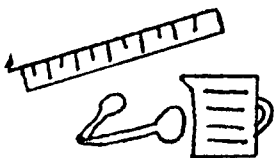
Usually the meal plan is given very simply -- for example, in terms of fruit, meat, bread, fat, milk and vegetables. Your nurse or dietician will give you a copy of your meal plan, which tells you how much of each of these foods you may have at each meal. With the food exchange lists these instructions can be followed out with a variety of tasty food choices.

You will recall that both the kind and the amount of food that you eat are important. The Canadian Diabetic Association Exchange Lists take care of both these things. First, they divide all of the foods you will eat into different kinds. Each of these makes up one Exchange List. There is a list for milk products, a list for meats, a list for fruits, a list for breads, a list for fats, and two lists for vegetables. In addition, there are two lists of "free foods". These lists are found on pages 7 to 20 of your "Meal Planning" booklet.

Exchange System

In addition to helping you choose the correct kinds of food for your diet, the Canadian Diabetic Exchange Lists also tell you the amounts of food to eat. They do this by the size of the serving allowed. The idea behind this is that any measured serving of food on a given list can be traded for any other measured serving on the same list. For example, your meal plan may say that you can have a meat exchange for breakfast. When you look at the "Meat Exchange List" you will see that one egg is the same as three slices of crisp bacon or one and one-half sausages. There are dozens of meats on the list -- and you may have any one of them in the amount shown. Just remember: ONE EXCHANGE EQUALS ONE MEASURED SERVING.

In most cases it will not be necessary to weight your foods in order to measure them. Most of the servings are given in terms of standard household measures - cups, teaspoons, tablespoons and inches. If you don't already have them, it would be wise to get a standard 8-ounce measuring cup, a set of measuring spoons and a small ruler. Measurements should be "level" - not heaped - and should usually be made after the food is cooked.



(Patient's Copy)

There Aren't Many Foods That You Can't Have

When you have had a good look at all of the foods on the Canadian Diabetic Exchange Lists, you will realize that there really are not many foods which you may not have. These foods are not on the Exchange Lists because they have too much pure sugar in them. You should not eat any of the following foods, except on the advice of your doctor:

sugar	honey	pie	sweetened condensed
candy	jam	cake	milk
	jelly	cookies	
	preserves		chewing gum
	syrup		regular soft
	marmalade		drinks

For exceptions to this advice, plus seasonings and free foods which will add zest to your diet, see pages 19 and 20 of your "Meal Planning" booklet.

(Patient's Copy)

Questions re Diet

There may still be a number of small questions which worry you about your diet. Let's clear them up here and now.

1. What about food shopping?

It is not necessary to buy special foods because you have diabetes. You can eat the same food as the rest of your family. When buying canned or frozen foods (especially fruits and fruit juices), look for the words "no sugar added" on the label. You may wish to buy some dietetic foods, such as non-caloric soft drinks or dietetic jam and jelly. Some of these are indeed allowed. But be careful. Some artificial sweeteners do contain carbohydrates. Check with your "Meal Planning" booklet or the Canadian Diabetic Association Diet Counselling Service whenever you are in doubt.

2. What about liquor?

Generally speaking, wine, beer and other alcoholic beverages are not permitted on a diabetic diet. However, if you enjoy a drink, it would be wise to discuss the matter with your doctor. He might show you how to include an occasional drink in your diet plan.

3. What about eating out?

There is no reason why having diabetes should stop you from eating out. When you are in a restaurant, ask about the way food has been cooked. Try to eat plain foods (i.e. those which have not been breaded, fried or cooked in a sauce), since you can judge their exchange value more easily.

If you take a lunch from home, you will find that it is quite easy to prepare. Just follow your meal plan, and choose exchanges which may be wrapped and carried easily.

4. What about entertaining?

As we said before, a diabetic diet is a healthy and tasty diet. There is no reason why you shouldn't cook the same foods for your guests as you would for yourself. If you wish to add extra fat or flour to a given dish, simply remove your own portion before you do so.

5. What about illness?

If you are nauseated or vomiting, or if you have diarrhea or a poor appetite, you may not feel like eating your regular diet. If any of these things happen, you should phone your doctor. He may suggest that you convert your meal plan into fluid exchanges. If he does, turn to pages 20 and 21 of your "Meal Planning" booklet for directions.

6. Canadian Diabetic Association Diet Counselling Service

If you have any questions or problems regarding your diet, the C.D.A. Diet Counselling Service is a good place to turn. This service is offered free of charge to all diabetic patients. Contact your local C.D.A. branch for details.

(Patient's Copy)

Medicine

Some diabetics can keep their condition in balance by just following their diets. Other diabetics require some sort of medicine in addition to their diets to stay healthy.

Diabetic medicine comes in two forms: - insulin and oral antidiabetic pills.

If a diabetic person's pancreas is making little or no insulin, his doctor may wish him to take insulin. Insulin must be injected beneath the skin because, if it is swallowed, it is destroyed by the digestive juices of the stomach.

If a diabetic person's pancreas is making some insulin, but not enough - or if the insulin it makes is not able to do the job it should - his doctor may wish him to take an oral antidiabetic pill. It is called an "oral" pill because it can be swallowed, and it is called an "antidiabetic" pill because it fights against diabetes.

Some diabetic persons can use the antidiabetic pills; others cannot. Don't try to compare your diabetes with that of other people! Each diabetic patient needs special study and care. After careful study, your doctor has decided which medicine you need to care for your diabetes. Follow his advice!

(Patient's Copy)

Antidiabetic Pills

Your doctor has decided that your diabetes will be kept in its best balance if you take an antidiabetic pill in addition to following your diet. This pill will help you manage your diabetes by _____.

_____ . The name of the pill he wishes you to take is _____. Each of these pills contains _____ milligrams of drug.

You are to take _____ milligrams or _____ pill(s) at the following time(s) every day: - _____.

It is most important that you take only this antidiabetic drug, and that you follow your doctor's instructions for taking it exactly. If you do this, your good health balance will stay even. If you don't, the balance will tip, and you may run into serious problems.

Although your diabetes is well managed with your antidiabetic pill, there may be some few times when you will have to take insulin as well. When your body needs more insulin than it can make (even with the help of your pill) - such as when you are sick, when you have a bad infection, or when you have an operation - this extra insulin may need to be supplied from outside your body by an injection. Should you need such an injection at home, your doctor will be able to arrange for it to be given by a visiting nurse.

(NOTE: -As with all kinds of medicine, antidiabetic pills may cause unpleasant side effects in some people. These are very rare. However, should you have any nausea, vomiting, loss of appetite or any other such symptom, report it to your doctor immediately.)

(Patient's Copy)

Insulins

Your doctor has decided that your diabetes will be kept in its best balance if you take insulin as well as following your diet. Insulin helps you manage your diabetes by making it easier for sugar to get from your blood into the cells, where it can be burned for energy. The name of the insulin your doctor wishes you to take is _____. It is a (rapid, medium, prolonged) acting insulin, which will have its strongest effect on your body at the following time: _____. Because of this, it is especially important that you avoid exercising at that time, and that you eat your _____ right on time.

The strength of the insulin which you will use is U _____, which means that there are _____ little bits of insulin in one c.c. (one syringeful). You are to take _____ UNITS of this insulin each time you inject, i.e. at the following time(s) every day: _____.

It is most important that you take only this kind of insulin, and that you follow your doctor's instructions for taking it exactly. If you do this, your good health balance will stay even. If you don't the balance will tip, and you may run into serious problems.

Two quick and sure ways of checking that you have the correct insulin for you are the following:

1. Name on the label: yours should be _____.
2. Colour of the print on the label: yours should be _____, which indicates U _____.

(Patient's Copy)

Equipment

There is certain equipment which you will need to give your insulin injections. It would probably be a good idea to keep all of this equipment together in one place (such as on a tray or in a special cupboard). Here are the things you will need:

1. Syringes:

You should buy U _____ syringes. It is important for you to have this size, because that is the strength of insulin you will be using. Your U _____ syringes will have _____ coloured markings on them.

You may wish to use either glass or plastic disposable (throw-away) syringes. If you choose glass, you should buy at least 2 syringes (to allow for sterilizing and breakage). If you choose disposables, buy them by the dozen, as they are less expensive that way. Glass syringes are somewhat less expensive than the disposable ones, but glass must be boiled or soaked in alcohol to make it safe (sterile) for use.

2. Needles:

You should buy _____ gauge, _____ inch long needles. This is the size that the doctor feels is best for you to use.

Here again, you may choose from 2 types of needles: metal hub, reusable OR plastic hub disposable. If you choose reusable needles, you should buy at least two. If you choose disposables, buy them in quantity. Disposable needles have the advantages of being sharper and not needing sterilization.

3. Insulin:

You should use the kind and strength of insulin which we discussed on the last page. It is wise to always have at least 2 bottles of insulin on hand - the one you are using, and an extra.

Each insulin bottle is marked with an expiry date. It is not safe to use that insulin after the date given. If the bottle expires before it is opened, return it to your drug store. If it expires once you have started using it, throw it away.

You may store the bottle of insulin which you are using at room temperature. Extra bottles should be kept in the refrigerator. Don't store your insulin in the freezer! The extreme cold reduces its effectiveness.

(Patient's Copy)

4. Alcohol:

You will need alcohol for cleaning your skin and some of your injecting equipment. You should buy 70% isopropyl alcohol for this purpose. Store your alcohol in a covered glass container, as it evaporates very quickly if left uncovered.

5. Cotton:

Absorbent cotton will be needed to apply the alcohol to your skin. Either bulk cotton or cotton balls will serve this purpose well. Store your cotton in a clean covered container.

(Patient's Copy)

Preparing Your Insulin

Here are the nine steps to follow in preparing your insulin injection:

1. Wash your hands.
2. Mix your insulin, if necessary, by rolling the bottle between your hands.
3. Moisten some cotton with alcohol.
4. Clean off the top of your insulin bottle with the alcohol-soaked cotton.
5. Remove any alcohol or water that may be in your syringe if you use a glass syringe.
6. Draw the right amount of air into the syringe.
7. Push the needle through the rubber top of the insulin bottle.
8. Push the air into the insulin bottle.
9. Pull the plunger back to withdraw the correct amount of insulin. Check for air bubbles in the syringe, and if there are none, pull the needle out of the insulin bottle.

Throughout the preparation and giving of your insulin it is important to keep from touching the following:

- (a) the stem of the plunger,
- (b) the top of the syringe,
- (c) the point of the needle,
- (d) the top of the insulin bottle.

(Patient's Copy - for patients using only one kind of insulin)

Preparing Your Insulin Mixture

Here are the steps to follow in preparing your insulin injection:

1. Wash your hands.
2. Mix your cloudy insulin by rolling the bottle between your hands.
3. Moisten some cotton with alcohol.
4. Clean off the tops of both insulin bottles with the alcohol-soaked cotton.
5. Remove any alcohol or water that may be in your syringe.
6. Draw air equal to the amount of cloudy insulin into your syringe. Push the needle through the rubber stopper of the cloudy insulin bottle. Push the plunger, forcing the air into the bottle. Pull the needle out of the stopper without drawing any insulin.
7. Draw air equal to the amount of regular (Toronto) insulin into your syringe. Push the needle through the rubber stopper of the regular (Toronto) insulin bottle. Push the plunger, forcing the air into the bottle. Leave the needle in place.
8. Turn the bottle of regular (Toronto) insulin upside down. Pull the plunger back to withdraw the correct amount of regular (Toronto) insulin. Check for air bubbles in the syringe, and if there are none, pull the needle out of the regular (Toronto) insulin bottle.
9. Tip the bottle of cloudy insulin upside down. Holding the plunger of the syringe firmly in position - at the dose of Toronto insulin - push the needle through the rubber stopper of the cloudy insulin. Pull the plunger back to withdraw the correct amount of cloudy insulin on top of the Toronto insulin already in the syringe. Pull the needle out of the bottle.

Throughout the preparation and giving of your insulin it is important to keep from touching the following:

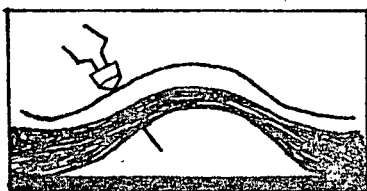
- (a) the stem of the plunger;
- (b) the top of the syringe,
- (c) the point of the needle,
- (d) the top of the insulin bottle.

(Patient's Copy - for patients using a mixture of two insulins)

Giving Your Insulin

Once you have prepared your insulin, most of the work is done. There are only six steps left to finish giving your insulin.

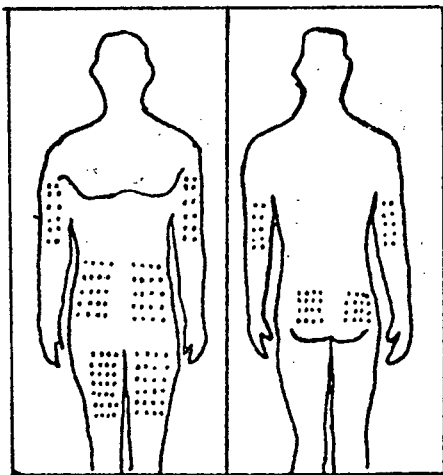
1. Clean the skin at the injection site with alcohol-soaked cotton.
2. Pinch up a large area of skin.
3. Insert the needle quickly into the skin at 60 to 90 degree angle.
4. Remove the hand that was pinching the skin. Using that hand, pull back on the plunger to be sure that the needle is not in a blood vessel. (If blood should come back into your syringe, you must discard that insulin and begin all over again.)
5. Push the plunger in slowly to inject the insulin.
6. Remove the needle quickly at the same angle that it was inserted, bracing your skin with a clean piece of cotton.



Insulin should always be injected to reach the loose space under your skin between your fat and your muscle. If you inject your insulin too close to the surface, it may go into the fat or the skin and cause a painful stretching and swelling.

In time, this may lead to shrinkage of the skin and fat, causing "hollows".

Too frequently injections of insulin in the same site lead to thickening of the skin, causing "lumps". These lumps prevent your insulin from being absorbed by your body at the proper speed. Although it may hurt less to give your injections in these places, you should not do so! Rotate the site



of your injections through as many as possible of the areas shown at left. A chart may be helpful in doing this. You should never give two injections closer than one inch apart in the same month!

(Patient's Copy)

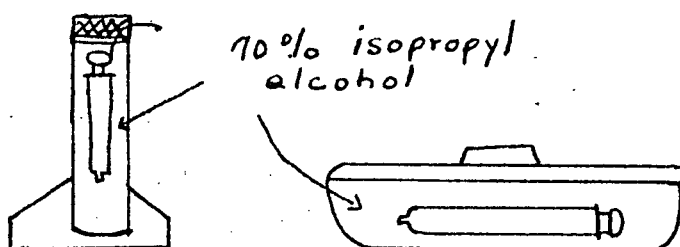
Care of Your Equipment

It is important that you keep your injection equipment sterile (germ-free), in order that it be safe for you to use. This may be done in two ways:

1. Daily Care with Alcohol

Alcohol is quite sufficient to keep your injection equipment sterile between weekly boilings. Here's how to use it:

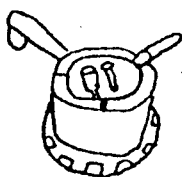
- (a) Pour 70% isopropyl alcohol into a clean covered container or a "steri-tube" (a special tube in a stand which you can buy at your drug store).
- (b) Draw enough alcohol into your syringe to fill it. S squirt it out. Repeat 2 or 3 times.
- (c) Put your syringe into the container. It should be covered with alcohol. Place the lid on the container.



- (d) Leave your syringe in the alcohol until you are ready to use it again. (It must have been soaking in the alcohol at least 20 minutes to be sterile.)
- (e) You will find that after many uses, the alcohol in your container will have evaporated or become discoloured. If it evaporates, just add some more (there should always be enough to cover your equipment). If it becomes discoloured, throw it away and get some fresh alcohol.

2. Weekly Care - Boil in Water

To be very sure that your injecting equipment is absolutely sterile, you should boil it in water once a week. The steps for doing this are quite easy:



- (a) Take your syringe apart. Put the parts into a large strainer.
- (b) Put the strainer in a pot of boiling water. Be sure that the water covers the equipment.
- (c) Boil 10 minutes.

(d) Pick up the strainer, hold it and pour the water out of the pan. Put the strainer back into the pan until everything has cooled.

(e) To reassemble your syringe:

- i. Pick up the outside part of the syringe (the "barrel") with one hand.
- ii. With the other hand grasp the handle end of the plunger.
- iii. Without touching any other part, slide the plunger into the barrel to put the syringe together.

(f) Wrap your equipment in a freshly ironed piece of cloth, or return it to the alcohol container - so it stays sterile until you are ready to use it.

(g) You will find that your syringe will become cloudy after many boilings. To get rid of this either soak it in vinegar or boil it in vinegar and water before sterilizing.

(NOTE: If you have re-usable needles, they too must be sterilized. Treat them exactly the same as your syringe, i.e. soak in alcohol every day and boil once a week. To put re-usable needles onto the syringe: pick up the big part of the needle (the "hub"), put the needle onto the syringe and turn to tighten. Do not touch the point of the needle or the tip of the syringe!)

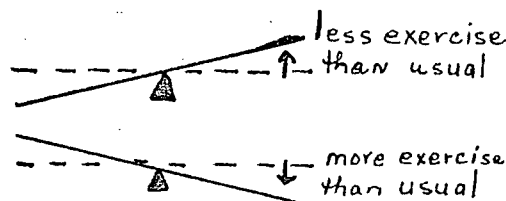
(Patient's Copy)

Exercise

Exercise is good for every one. It helps keep weight down, muscles strong and blood flowing properly. In short, it helps people stay healthy. This is especially true for diabetics.

If you will think back to the good-health balance you will remember that exercise, as well as diet, has an effect on the balance of sugar and insulin in the body. All physical activities (such as walking, swimming, gardening) are kinds of exercise. And all exercise burns up sugar.

Your doctor has planned your diet to give you the amount of food you need to do the activities you usually do. He has planned your medicine to see that you have just enough insulin to use up the sugar in your blood for energy. Therefore, to keep your good-health balance even, you should do about the same amount of exercise every day. The kind of exercise is not nearly as important as the amount. If you do more exercise than usual, it may result in too little sugar in your blood. If you do less exercise than usual, it may result in too much sugar in your blood. Neither one of these conditions is good, because both of them upset your good-health balance.



So plan your activities so that you do about the same amount of activity every day. (For example, if you walk to work on weekdays, take a walk on weekends too.) If, for some reason, your activity has to be more or less than normal (such as working overtime, planning an active vacation, or staying in bed with a cold), get in touch with your doctor. He will tell you how to change your diet and/or medicine to meet this change.

(Patient's Copy)

Personal Hygiene

1. General Care

In managing your diabetes, personal hygiene is very important. All of the things we have talked about so far (diet, medicine and exercise) are aimed at keeping the sugar and insulin in your blood in balance. Infection is another thing which can tip this good-health balance. Cuts and scratches are one source of infection: there are many others as well. To avoid infection, follow these simple rules:

- (a) Be careful with anything sharp or hot.
- (b) Keep your skin and hair clean with regular bathing. Use lukewarm (never hot!) water and mild soaps and shampoos. Dry yourself gently with a soft towel.
- (c) Take good care of your teeth and gums, by brushing after meals and having regular check-ups by your dentist. Be sure to tell your dentist that you are diabetic.
- (d) Treat minor cuts and scrapes as follows: wash with warm, soapy water and put on a clean bandage. Never put iodine on cuts, as it could burn your skin. If cuts, scrapes or bruises do not heal in a reasonable time, tell your doctor.

2. Special Foot Care

In diabetes, the blood supply is often decreased (lessened) to the extremities, especially the legs and feet. This means that foot injuries may start more easily, and be harder to heal. It also means that you may not be able to feel heat, cold or sharp objects that may damage your feet. These simple rules will help you avoid trouble with your feet:

- (a) Wash your feet daily with a soft cloth and warm soapy water. Dry them thoroughly. If your skin tends to be rough or dry, apply a gentle skin cream (such as lanolin). If your skin tends to be moist or sweaty, apply talcum powder. Check with your doctor before using special creams, salves or powders on your skin.
- (b) Wear shoes that fit and are comfortable. Break new shoes in slowly by wearing them a few hours each day at first.
- (c) Don't wear round garters, socks or stockings that are too tight, or anything else that interferes with the blood supply to your legs and feet. Put on clean socks or stockings every day.
- (d) Never go barefoot.

(Patient's Copy)

(e) Cut your toenails (and fingernails too, for that matter) after you bathe when they are soft. Cut straight across the nail (not too short!) and don't dig into the corners.

(f) Don't try to cut corns and callouses by yourself. Get them treated by your doctor.

(g) If your feet are cold at night, wear clean socks to bed. Never use a heating pad or hot water bottle because these may cause burns on your feet.

(h) Check your feet carefully every day, and report any skin changes which do not go away to your doctor.

3. Smoking

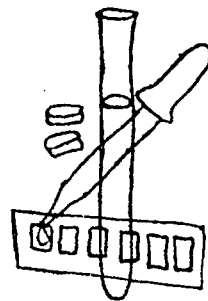
As we said, in diabetes blood circulation may be lessened. The chemicals that get into your system when you smoke tend to make your blood vessels contract (or tighten). This interferes with your blood circulation even more. Whether or not you may smoke (and if so, how much) is something you should talk to your doctor about.

4. Eye Care

Changes in vision may take place in diabetes. Therefore, you should have a yearly check-up by an eye specialist.

Urine Testing

One of the most accurate ways of checking that your good-health balance is even -- rather than tipped to one side or the other -- is by testing your urine. Your urine test results will tell the doctor whether all the things you are doing to manage your diabetes are working O.K. Based on the results of your tests, he may make a change in your diet, medicine or exercise which will help you feel better and keep a better balance.



You should know how to make two tests on your urine: one for sugar and one for acetone. Whichever urine test you are making you should always use a "double-voided" specimen of urine. Here's how to get one:

- (a) About ½-hour before your time to test, urinate as much as you can. Don't save any of this urine.
- (b) Drink a glass of water and wait about ½-hour.
- (c) Urinate again and use this specimen for testing (this second urine is called a "double-voided specimen").

1. Testing for Sugar

If you eat more food than is allowed, forget to take your medicine or do less exercise than usual, sugar will build up in your blood. (The same thing may happen if you are very upset about something or if you have an infection.) As the amount of sugar in the blood builds up, some of it will overflow into your urine. An unusual amount of sugar in the urine is a sure sign that your good-health balance is tipped.

One of the most accurate means of testing your urine for sugar is with the Clinitest tablets. Here's how:

- (a) Collect your urine in a clean container. With the dropper in an upright position place 5 drops of urine in the test tube. Rinse the dropper and add 10 drops of water.
- (b) Drop 1 Clinitest tablet into the test tube (be careful not to touch it with damp fingers). Watch while the complete reaction takes place. Do not shake the tube during the reaction nor for 15 seconds after the boiling has stopped.
- (c) After the 15-second waiting period, shake the test tube gently and compare it with the colour chart.

Note: Careful observation of the solution in the test tube while reaction takes place and during the 15-second waiting period is necessary to detect rapid "pass through" colour changes caused by

amounts of sugar over 2%. Should the colour rapidly "pass-through" green, tan and orange to a dark greenish-brown, record as over 2% sugar without comparing final colour development with colour chart.

Your doctor wishes you to test your urine for sugar at the following time: _____

2. Testing for Acetone

Generally speaking, your body uses sugar for energy. However, it can also get energy from fat. When your cells are not getting enough sugar to provide the energy they need, your body breaks down its own fat for energy. This process makes a substance called acetone, which will spill over into your urine in the same way that sugar does when it gets too high.

Moderate amounts of acetone in your blood will cause nausea, vomiting, flushed and dry skin, sleepiness, and deep rapid breathing. Large amounts of acetone cause unconsciousness. So you can see that it is important to know when you are building up acetone. The way to do this is by testing.

One simple and accurate test for acetone can be done with Acetest tablets. Just follow these steps:

- (a) Collect your urine in a clean container. Place one Acetest tablet on a clean piece of white paper.
- (b) Put one drop of urine on the tablet.
- (c) Wait 30 seconds and compare the colour of the tablet with the colour chart.

Your doctor wishes you to test your urine for acetone at the following times: _____

- NOTES:
- 1. If your urine tests greater than 1% for sugar on several tests in a row, or if you get a positive acetone test, notify your doctor.
 - 2. There are many other tests for urine sugar and acetone available. If you wish to use these, discuss the matter with your doctor. If he approves, be sure to read and follow the package directions carefully. This is essential if your test is to be accurate.

3. Keeping a Record

In order for your doctor to get an overall picture of how well balanced your diabetes is, he will have to have an on-going record of your urine tests. Such a record is easy to keep. Here's a sample.

<u>Date</u>	<u>Times</u>							
	7:30 a.m.		11:30 a.m.		4:30 p.m.		8:30 p.m.	
	<u>S</u>	<u>A</u>	<u>S</u>	<u>A</u>	<u>S</u>	<u>A</u>	<u>S</u>	<u>A</u>
April 10	neg	neg	+1	neg	+2	tr	+2	tr

Problems

As we have said, you will usually be able to keep the sugar and insulin in your blood in balance by following your doctor's orders about diet and medicine, and by getting the same amount of exercise every day. There are, however, some other things -- things you can't help -- which may tip your good-health balance. Some of these things are illness, infection, and severe emotional upset.

Whenever one of these things happens to you, or whenever you 'cheat' on your diet, medicine or exercise, you are in danger of developing a problem with your diabetes. It is important that you should be aware of these problems (what causes them and how to know you have them) so that you can treat them when they occur and avoid them in the future.

(Patient's Copy)

Diabetic Coma



Diabetic coma is the problem which results when your sugar-insulin balance is tipped to the sugar side. As we mentioned when we were discussing urine testing, your body can make energy from fat as well as from sugar. It does this when there's not enough insulin around to use your blood sugar in the way it ordinarily should. When your body burns fat for energy, it produces fatty acids like acetone. Too much acetone is bad for your body. It causes a condition called acidosis, which can lead to a diabetic coma. You may hear diabetic coma called other names, such as "diabetic acidosis", "diabetic ketosis" or "hyperglycemia" (which means extra blood sugar). Whatever name you use, it is important to remember that diabetic coma is a very serious diabetic problem!

1. Causes

There are several things which might cause you to have a diabetic coma. Here are the most usual causes:

- (a) eating too much food;
- (b) not taking enough diabetic medicine (that is, less insulin or antidiabetic pill than you are supposed to);
- (c) taking much less than your usual amount of exercise;
- (d) a fever or an infection;
- (e) a severe emotional upset.

2. Symptoms

How will you know you are going into a diabetic coma? Here are some of the most common symptoms:

- (a) dry skin and tongue;
- (b) severe thirst;
- (c) weakness, drowsiness or tiredness;
- (d) nausea, vomiting or loss of appetite;
- (e) deep rapid breathing and a "fruity" smelling breath.

3. Treatment

Here's what to do if you feel you might be going into a diabetic coma:

- (a) Test your urine: - it will probably be 2% or greater for sugar and positive for acetone.
- (b) Phone the doctor: - tell him how you feel and what your urine tests said. He will tell you what to do next.

4. Prevention

How can you keep from having a diabetic coma? Here are some useful suggestions:

- (a) Follow your diet carefully - never omit foods or meals and never take more than you should.
- (b) Never skip your diabetes medicine. Always measure it carefully and take it right on time.
- (c) Do the same amount of exercise every day.
- (d) Avoid infections and emotionally upsetting situations whenever you can.
- (e) Test your urine regularly and report high sugars to your doctor.

(Patient's Copy)

Insulin Shock



Diabetic coma is sometimes confused with insulin shock. Don't let this happen to you! These two diabetes problems are complete opposites. Insulin reaction is the problem which results when your sugar-insulin balance is tipped to the insulin side. That is to say you have either too much insulin or not enough sugar in your blood. Other names for insulin shock are "insulin reaction" and "hypoglycemia" (meaning not enough blood sugar).

When your sugar-insulin balance is tipped to the insulin side, the result is that your blood has more insulin in it than it has sugar for the insulin to work on. This state of affairs is quite harmful for your body. Thus, insulin shock is a serious diabetic problem, and one which must be dealt with at once!

1. Causes

There are several things which might cause you to go into insulin shock. Here are the most usual causes:

- (a) not eating enough food (e.g. delaying or skipping meals, or leaving out foods you are supposed to eat);
- (b) taking more than the correct amount of diabetes medicine;
- (c) taking more than the usual amount of daily exercise.

2. Symptoms

How will you know you are going into insulin shock? Here are some of the most common warning signs and symptoms:

- (a) feeling nervous, excited, faint or irritable;
- (b) sweating;
- (c) hunger;
- (d) headache;
- (e) trembling;
- (f) trouble seeing clearly.

3. Treatment

Although insulin shock is a serious problem, it is a very easy one to treat. Here's what to do if you are feeling the symptoms of insulin shock:

(Patient's Copy)

(a) Eat or drink something immediately. (If you have something sweet right on hand, take it. If not, don't waste time looking for sweets; just eat something!)

(b) Wait 15 minutes.

(c) THEN - if you don't feel better - eat or drink some more and phone the doctor. He will tell you what to do next.

4. Prevention

How can you keep from having insulin reactions? Follow these suggestions:

(a) Never skip or delay your meals. Always eat exactly what your meal plan says, at the time it says.

(b) Always measure your diabetic medicine carefully and take it on time.

(c) Eat or drink something extra beforehand if you know you are going to do more exercise than usual. OR, if there wasn't time for that, eat or drink something immediately afterwards.

(d) Always carry something sweet with you.

(Patient's copy)

Infection



As we mentioned in our discussion of diabetic coma, an infection is one of the things which may cause you to go into a diabetic coma. This is because the fever that comes with many infections acts to tip the sugar-insulin balance toward the sugar side. Thus, if you have an infection (such as a severe cold or the flu), you should be on the lookout for the symptoms of a diabetic coma. In addition to those warning signs, if you take your temperature you will find that it is above normal.

Because an infection has much the same effect on your body as a diabetic coma, you would expect to treat it the same way - and you do!

(a) Test your urine (once again, it will probably be positive for both sugar and acetone).

(b) Phone your doctor. Tell him how you feel, what your temperature is, and what your urine tests said. He will give you specific instructions about your diabetes medicine and diet.

(c) Go to bed - you'll need rest to allow your body to fight that infection.

Now that you know that infections can be serious problems for you, you'll want to avoid them whenever you can. Here are some hints for doing just that:

(a) Stay away from people who you know already have infections of one sort or another.

(b) Follow the rules we discussed under "Personal Hygiene".

(c) Treat simple injuries right away so that they don't have a chance to become infected.

(Patient's Copy)

Protect Yourself

There are two very simple things you should do to protect yourself:

1. Wear and/or carry identification

Both diabetic coma and insulin shock are serious problems which call for quick treatment. When they are severe, the diabetic person can faint. That's why it's very important to wear or carry diabetic identification. This identification will help you get the treatment you need quickly. Medic Alert is one very good source of diabetic identification. There are others. Talk to your doctor about which kind of identification you should use.

2. Carry something sweet

Insulin shock may come on very suddenly - almost without warning. When it does, you want to be able to treat it promptly. That is why it would be wise for you to get into the habit of always carrying something sweet (like candy) in your pocket or purse.

(Patient's Copy)

Where to get help

There are many people and organizations who are ready to help you keep your good-health balance even. Here's a quick reference of who they are and what they will do for you.

SOURCE	WHAT THEY CAN DO FOR YOU
1. Doctor <u>(phone number)</u>	1. Get you started with a good balance of diet, exercise and diabetes medicine. 2. Change this plan if it isn't working for you. 3. Advise you what to do when your good-health balance is in danger of tipping.
2. The Canadian Diabetic Association <u>(branch phone number)</u>	<p>The Canadian Diabetic Association is a non-profit organization dedicated to helping diabetics live a fuller and healthier life. You may join the C.D.A. through the national office or any one of its local branches. The benefits of membership in the C.D.A. broadly include:</p> <ol style="list-style-type: none"> 1. <u>Services</u>. Free diet counselling and operation of holiday camps which provide regulated diets for children and adults are some of the services you can enjoy as a member of C.D.A. 2. <u>Education</u>. At every local C.D.A. meeting, part of the program is devoted to either demonstrations by doctors and dieticians, lectures, open forums, or instructive films designed to help you and your family live a better and more normal life. 3. <u>"The Newsletter"</u>. The C.D.A. publication "The Newsletter" is mailed to all members four times a year. Information and prices on other publications on diabetes are available from the national office. 4. <u>Encouragement</u>. You and your fellow members of the C.D.A. have common problems and objectives. In group meetings you have the opportunity of seeing how others have overcome certain difficulties. Then, too, you may be able to help someone. Many have found encouragement and benefited by participating in these meetings.

SOURCE	WHAT THEY CAN DO FOR YOU
3. Public Health or Victorian Order of Nurses visiting nurses.	1. Do home teaching. 2. Give insulin injections at home. 3. Help with your food care if you can't manage it alone.
(phone numbers)	
4. Dial-a-Dietician (phone number)	<p>Various provincial dietetic associations have organized Dial-a-Dietician programs to answer the questions about food and nutrition which arise in day-to-day living. Information is available on such topics as:</p> <ul style="list-style-type: none">- every day nutrition- foods and food values- budgeting and purchasing- meal planning and preparation- food additives- labelling- food fads and fallacies- therapeutic diet modifications <p>If you have questions about any of these subjects, you should call the Dial-a-Dietician number. Your questions will be recorded, and a professional dietitian will call you back - within 48 hours - with the answers.</p>

(Patient's Copy)

Books for Diabetics

1. Danowski, Thaddeus S. Diabetes as a Way of Life. New York: Coward-McCann, 1964 [reviewed in Diabetes, XIII, No. 6 (November-December 1964), 655-656].

The book's outstanding qualities are its dispassionate, objective way of looking at the problems of diabetes and the articulate, adult manner in which the information is presentedIn addition to the carefully presented practical information, especially valuable chapters deal with "Social Aspects of Diabetes", and "Living with Diabetes: Attitudes and Expectations"....The only drawback of the book is that it occasionally reaches above the level of even the rather sophisticated layman.

2. Dolger, Henry and Seeman, Bernard. How to Live with Diabetes. New York: W.W. Norton and Company, 1959 and 1965 [reviewed in Diabetes X, No. 1 (January-February 1961), 69].

This book is well written and should be of interest to patients and physicians alike....The authors show an excellent understanding of the psychology and emotional problems confronting the juvenile diabetic, and the section on special problems for women is interesting and instructive.

3. Duncan, Garfield B. A Modern Pilgrim's Progress with Further Revelations for Diabetics. Philadelphia: W. B. Saunders Company, 1967 [reviewed in Diabetes, XVII, No. 8 (August 1968), 523].

This book is written in the form of a story about the experiences of a social worker with diabetes, assigned to the diabetes clinic and wards of a Philadelphia hospital. With this technique, Dr. Duncan is able to discuss a variety of problems presented by different patients....A 67 page appendix briefly outlines the various types of insulin, its administration including mixtures, the recognition of insulin reactions and diabetic coma, urine testing, foot care and the exchange system of diets....A glossary is included and a useful index.

4. Joslin, Elliott P. Diabetic Manual. Philadelphia: Lea and Febiger, 1959 [reviewed in Diabetes, X, No. 1 (January-February 1961) 68].

Throughout the book the author's conviction is frequently reiterated, namely that if the individual with diabetes follows treatments wisely, he will live long and happily....The young diabetic will be interested to read of Dr. Joslin's opinion regarding marriage....From the dietary standpoint, some of the data....can be challenged.

5. Rosenthal, Helen, and Rosenthal, Joseph. Diabetic Care in Pictures. Philadelphia: Lippincott, 1968 [reviewed in Diabetes, XVII, No. 11 (November 1968), 709].

The authors are to be congratulated for a clear, descriptive, verbal and graphic presentation of diabetic diets; insulin preparations and the equipment available for their injection; urine testing; personal hygiene; foot care and Buerger-Allen exercise....Questions which the diabetic or his family may ask regarding obesity, heredity, marriage, pregnancy, exercise and alcoholic beverages are briefly but adequately answered by the authors.

6. Schmitt, George F. Diabetes for Diabetics. Miami: Diabetes Press of America, 1966 [reviewed in Diabetes, XVI, No. 9 (September 1967), 671].

To the extent that a manual can supplement personal instruction, Dr. Schmitt's book does a satisfactory job. It includes most of the reference data and technical facts required concerning diet, insulin, oral drugs and testing methods. An unusual feature is a collection of colour photos which will be useful to the newly instructed patient. But there are pictures of retinopathy and arterial occlusion which might not, however, be appropriate for the apprehensive patient.

7. Sindoni, Anthony M. The Diabetic's Handbook. New York: The Ronald Press Company, 1959 [reviewed in Diabetes, IX, No. 6 (November-December 1960), 506].

Dr. Sindoni's handbook includes a large amount of useful data concerning diabetes, its complications and its treatment....Its faults are overinclusiveness and failure to confine itself to the diabetic patient. Much of the material is more appropriate to nurses, dieticians or semi-professional personnel having some background of medical knowledge.

Pamphlets for Diabetics

TITLE	SOURCE	COST
1. A Guide for the Canadian Diabetic on Oral Therapy	Eli Lilly & Co., Toronto, Ont.	Nil
2. Care of the Child with Diabetes	Ames Co., Rexdale, Ont.	Nil
3. Care of the Feet	Toronto Dept. Public Health	Nil
4. Diabetes: A Question and Answer Book for Canadians	Canadian Diabetic Association	Nil
5. Diabetes Check Facts	Canadian Diabetic Association	Nil
6. Dietetic Foods Without Cyclamate	Canadian Diabetic Association	Nil
7. Exchange Lists for Meal Planning for Diabetics in Canada	Canadian Diabetic Association	50¢
8. Sample Diets for Use in Conjunction with #7	Connaught Labs., Willowdale, Ont.	Nil
9. Guidebook for the Diabetic Patient	Ames Co., Rexdale, Ont.	Nil
10. I am a Diabetic - Identification Card	Canadian Diabetic Association	Nil
11. If You Have Diabetes	Chas. Pfizer & Co., Montreal, Que.	Nil
12. Instructions to Teachers with Diabetic Children in their Classes	Canadian Diabetic Association	Nil
13. Insulin Use Information Kit, containing: "Questions and Answers" folder, "Hospital Instruction Program" folder, "Techniques for Self In- jection" chart and folder, "Tips on Filling Insulin Syringe" booklet, list of refer- ences, "Know Your Insulin Syringe" chart and site selector	Becton-Dickinson and Co., Clarkson, Ont.	Nil
14. Insulin and Insulin Preparations	Connaught Labs., Willowdale	75¢
15. Manual for Diabetics in Canada	Canadian Diabetic Association	Nil
16. One Out of Every 50 Canadians may be a Diabetic	Canadian Diabetic Association	Nil
17. Right From the Start - Complimentary Clinitest Instruction Kit	Ames Co., Rexdale, Ont.	Nil
18. Some Thoughts for Young Diabetics and their Parents	Canadian Diabetic Association	Nil
19. Stop, Read and Understand Food Labels	Canadian Diabetic Association	Nil
20. This Could Save Your Life - Application Form and Message	Canadian Medic-Alert, Toronto, Ont.	Nil
21. Travelling with Diabetes	Canadian Diabetic Association	Nil

APPENDIX G

OUTLINE OF DIABETIC TEACHING PROGRAM

DAY 1Film: What is Diabetes?

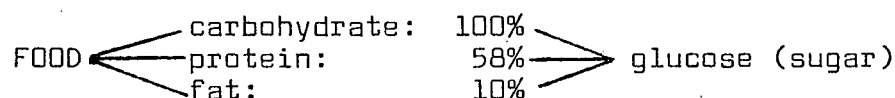
The patients watch a twenty minute Trainex film titled "What is Diabetes". This film deals briefly with topics such as (a) incidence of diabetes, (b) symptoms of diabetes, (c) characteristics of maturity onset diabetes, (d) some aspects of treatment, and (e) some aspects of pathophysiology of diabetes. After the film the dietician conducts a question period.

DAY 2: Lecture by DieticianDietary Control of Diabetes

Review of information the film gave about diet:

The most important single factor in the treatment of most diabetics is maintaining a proper diet. When a person has diabetes, his body cannot handle a simple sugar, called glucose, because of inadequate insulin production or activity. Glucose comes from the foods we eat. The diabetic must eat controlled amounts of food. By eating the correct amounts and kinds of foods, the diabetic can control the amount of glucose going into the blood.

A certain part of all the foods we eat is changed into glucose or sugar in the body. The foods we eat are made of three main substances. These are carbohydrate, protein, and fat. Some of these food substances produce more sugar than others. Carbohydrate, protein, and fat change to sugar and provide the fuel for our energy needs. We will find out now what foods are carbohydrate foods, what foods are high in protein and fat, and how much sugar these foods produce in the body.

Carbohydrate foodsProtein FoodsFat

- | | | |
|--|---|---|
| 1. Starches - bread, potatoes, cereal, corn, parsnips, flour and foods made with flour, spaghetti, noodles, rice, dried beans and peas, etc. | Meat
Fish
Poultry
Eggs
Cheese

Milk | Butter/Margarine
Oil
Fats used in cooking
Salad dressing
Cream
Cream cheese
Nuts, olives
Avocado
Side Bacon |
| 2. Fruits and fruit juices | | |
| 3. Vegetables - more starchy (mainly root vegetables)
carrots, beets, onions, turnips, peas, squash, etc.
- less starchy (salads and greens)
lettuce, radishes, green beans, spinach, cauliflower, etc. | | |
| 4. Sweets - sugar, pie, cake, icing, candy, ordinary soft drinks, syrup from ordinary canned fruit, jam, jelly, honey, marmalade, etc. | | |

It is important for a diabetic to avoid this fourth group of carbohydrate-containing foods - viz. sugar and foods concentrated in sugar. Reasons:

1. Sugar is a concentrated form of carbohydrate which requires little digestion and enters the blood stream quickly, elevating the blood sugar because there is too little insulin activity to handle it.
2. It is easy to make mistakes in measuring sugar or concentrated sweets, with greater harm resulting than from mistaken measurements of less concentrated foods.
3. Use of sweets reduces the allowance of starches, fruits, and vegetables. This cuts down on the bulk of the diet and the person may become hungry later.
4. These foods are "empty calorie" foods with few vitamins or minerals - they are the foods that used to excess, make people without diabetes gain weight.

Because carbohydrate foods are really just complex forms of sugar (all carbohydrate is converted to sugar in the body), these carbohydrate foods require a lot of insulin so that the body can make good use of the sugar they supply. Controlled amounts of all foods are important so that the diabetic will have a controlled amount of sugar in the blood to balance the amount of insulin his own body is producing, or the insulin he is taking by injection.

Explanation of Exchange

You have seen how foods are classified as carbohydrate, protein, and fat foods. From these three groups, foods are further subdivided into 6 basic food groups:

- | | | | | |
|---------------|---|---------|---|---------|
| 1. bread |) | 4. meat |) | |
| 2. fruit |) | 5. milk |) | protein |
| 3. vegetables |) | 6. fat |) | fat |

To make your meal planning as simple as possible, you are given a meal plan sheet telling how many servings to take from each food group at each meal. Because all the foods within a group have about the same amount of sugar, you can substitute or "exchange" foods from within the same group for each other in the portion sizes stated. Remember - substitute foods from within the same group but not between groups, because foods in different groups produce different amounts of sugar. Think of an exchange as a serving, e.g. 1 fruit exchange is one serving of fruit in the amount given in the fruit list. Two fruit exchanges are 2 servings of fruit or juice, or double of any one serving.

Two Meal Planning Booklets

The booklets contain the 6 food lists. The booklet most suitable for you has been prescribed for you by your doctor.

C.D.A. - Canadian Diabetic Association

A.D.A. - American Diabetic Association.

(These are similar in principle. The A.D.A. food lists are simpler and more easily learned; they are therefore suited to many maturity-onset diabetics controlled by diet alone or diet and hypoglycemic agents. The C.D.A. food lists are more extensive and better suited to younger diabetics and patients who can approach a new learning situation with ease.)

Basic Principles of All Diabetic Diets

1. Eat meals at regular times.
2. Eat three meals a day and snacks as outlined on your meal plan sheet.

Reasons:

(a) to provide the body with a steady amount of food throughout the day (body can't handle a large amount of sugar at one time).

(b) to provide the body with food at the time that injected insulin is most effective in its action, e.g. NPH - most active in later afternoon and evening - have afternoon and evening snacks, dinner on time.

Measuring

Measuring your food at home is important. It is the only accurate way of knowing you are getting the correct amounts of food. The household measurement of one serving or exchange of each food is stated in the food lists in the booklet. With practice, you will learn to visualize the correct amount of each food according to your own individual meal plan. However, measure your food (a) when you are a new diabetic and just learning, (b) when you receive a new diet copy, (c) when your diabetes is not under good control, (d) periodically as a checkup against your visual estimation of serving sizes.

Your tools are:

- glass measuring cup - for liquids (milk, juice)
- set of four graduated measuring cups (1/4, 1/3, 1/2, 1 cup)
for solids; level, not heaped.
- measuring spoons - for butter, salad dressing, oil, etc.

Study your booklet to become familiar with the food lists:

1. Milk Exchange List (C.D.A., p. 7, A.D.A., p. 5) lists whole, 2%, skim, buttermilk, etc. Difference is the fat content. Your meal plan sheet states what type of milk you are to take. Refer

to your sheet. Measure your total day's milk allowance into a pitcher in the morning and use it throughout the day so that you don't need to measure small amounts for coffee, tea.

2. Vegetable Lists

More Starchy (C.D.A. Group A, p. 8)
(A.D.A. Group B, p. 7)

Ask patients to recall examples. Usually one serving of these vegetables is allowed daily, at main meal. Must measure.

Less Starchy (C.D.A. Group B, p. 10)
(A.D.A. Group A, p. 6)

Contain only a small amount of carbohydrate so may be taken in average amounts at both meals and between meals as snacks, if desired. (Snack ideas - celery sticks, radishes, lettuce/cabbage wedge). Better to take a larger serving of these vegetables when hungry than to take extra servings of some other food.

3. Fruit List (C.D.A. p. 12, A.D.A. p. 8)

Includes fresh, diet canned, unsweetened cooked, frozen, dried fruits and fruit juices. Important - fruit contains natural sugar or carbohydrate, even when raw or unsweetened, so unsweetened fruit cannot be eaten freely in any amount. Some fruits contain more natural sugar than others so the serving size varies with each fruit. Learn by heart the serving sizes for the fruits that you eat. Do not use ordinary canned fruit which has a lot of sugar added. Diet canned fruits available:

1. packed in water only
2. with artificial sweetener, saccharine
3. with a small amount of added sugar. This is not a concentrated sweet and is perfectly safe to use. Read the label carefully for the size serving to be used for one fruit exchange.

4. Bread List (C.D.A. p. 14, A.D.A. p. 10)

Contains all the starchy, high carbohydrate foods which produce a lot of sugar and require a lot of insulin. Correct measurement of these foods is therefore very important. Corn, parsnips and potatoes are bread substitutes. When using unsliced bread or odd-shaped loaves, get 16 slices from a 16 oz. (1 lb.) loaf. Canned soup and biscuits may be used as bread (or bread and fat) substitutes to allow variety in meals and snacks. Lists are available which state the correct substitutions or exchanges for canned soups and biscuits.

5. Meat List (C.D.A.p.16, A.D.A. p. 12)

Contains all the high protein foods, except milk (examples). May use all kinds of meat and fish. Cooking method important - recommend cooking without added fat by:

1. broiling
2. baking
3. using Teflon pan
4. using heavy cast iron pan
5. cooking by moist heat - with stock or vegetable water
- with beef or chicken cubes
- juice from canned tomatoes, etc.
6. pressure cooker

If fat is used, must be part of fat allowance at the meal, not extra. Remove visible fat from meat before cooking, drain well if fat comes out of meat in cooking.

1 lb. meat = 16 ounces = 12 ounces when cooked
for 4 meat exchanges, use 1/3 lb. raw meat
for 3 meat exchanges, use 1/4 lb. raw meat
for 2 meat exchanges, divide 1 lb. meat into 6 portions

6. Fat List (C.D.A. p. 18, A.D.A. p. 14).

Fat foods are high in calories, so if your doctor wants you to lose weight, there may only be a small amount of fat included in your diet. Measure all fat carefully.

Free Foods (C.D.A. p. 19, A.D.A. p. 4)

These are foods which contain little or no food value and may be used as desired.

Examples: clear coffee/tea
artificial sweeteners
clear broth, bouillon cubes
lemon juice, vinegar
spices and seasonings
sugar-free soft drinks (examples) - do not use
diet soft drinks containing reduced amounts
of sugar.

Special Diet Foods

Special diet foods are NOT necessary. A diet planned for a diabetic is a well-balanced food pattern that the whole family can enjoy - all the basic foods for good nutrition are included. Do not usually need to cook separately for a diabetic member of the family (except under certain circumstances). Same foods in measured amounts.

Warning re special diet foods: read labels carefully. Check if label states how many calories are in one serving (if less than 10

calories/serving, may take one serving in addition to those foods listed on your meal plan. Sugar-free does not mean calorie-free or free to take in any amount. The product may contain other forms of carbohydrate (sorbitol, lactose, etc.) or protein and fat which provide some sugar and also provide calories. Special diet chocolate bars contain about the same calories as ordinary chocolate bars and should not be used unless the correct substitution is made on the diet.

Show Cookbooks

If interested in a cookbook, get the one published by C.D.A. or A.D.A. whichever exchange system has been prescribed for you.

Eating Out

Diabetics can eat away from home as easily as anyone else. Main considerations are that you must -

- (a) know your meal pattern by heart
- (b) select wisely
- (c) be able to visualize the correct amounts of food according to your own meal pattern.

Foods selected should be plain foods of known composition. Sauces, casseroles, deep-fried foods and desserts should be avoided.

Meat choice - roast, steak, chops, meat patty, baked fish.

From bread exchange list - baked/whole potato, small roll.

Vegetables - without sauce, salad, plain or with lemon.

Fat exchange - probably some fat used in cooking, butter: 1 pat = 1 tsp. cream for coffee; if enough fat exchanges for salad dressing or sour cream, serve your own. Ask that meat be served without gravy.

Fruit - eat fruit serving later at home if fresh fruit or unsweetened juice not available.

Ice cream may be chosen for dessert if substituted correctly, as indicated on the food lists.

(Could discuss eating at drive-ins, quick lunches, on holiday trips, if time allows.)

Eating dinner out often means eating at a later hour than usual. If taking insulin, it is important to eat some food, e.g. your evening snack, at your regular dinner time or may risk a low blood sugar reaction.

Illness

If you cannot tolerate ordinary solid foods, it is important to get a comparable intake of soft or liquid foods. Examples of foods from the food lists which are often tolerated when ill:

Fruit list - juices

Bread - canned soup from soup list, soda crackers or biscuits
from biscuit list, cooked cereal, milk toast

Meat list - eggs; scrambled, with milk as eggnog or custard,
with orange juice as fruit eggnog; cottage cheese

Milk - as beverage, in soup, on cereal, in tea or coffee

Vegetable list - mixed vegetable juice or tomato juice, if
desired

Fat - omit until tolerated

C.D.A. booklet pp. 20-22 give suggestions for fluid diet on day
of illness.

Clear broth and tea are usually well tolerated, but have no calorie
value. Warm fluids taken frequently in small amounts are best
tolerated. Consult your doctor early if you cannot take your meals.

Exercise:

The importance of eating extra food before doing unusual
exercise will be discussed on Wednesday.

Importance of Not Changing the Diet

A diabetic person should not change his diet without con-
sulting his doctor because:

(a) the amount of food prescribed for you has been carefully
balance with your medication and amount of activity.

(b) if not enough food is eaten, a low blood sugar reaction
may occur (in diabetics who are taking insulin).

(c) if too much food or the wrong type of food is eaten,
urine tests will show sugar and the diabetes may go out of control.

(d) undesirable weight gain or loss could result and make
the diabetes more difficult to treat.

DAY 3: Lecture by NurseUrine Testing, Skin Care and ExerciseUrine Testing

The urine testing tells how controlled the diabetes is in relation to diet, exercise and medication. Sugar does not spill into urine unless the blood sugar is approximately twice the normal, 180 - 200 mgm.

Testing materials for testing for sugar

Testape is a paper which is very specially treated and extremely sensitive. It will pick up small amounts of sugar. Make certain fingers are dry as reading will be inaccurate if wet or damp. Wet portion of tape should not touch fingers and should be held down. Storage is important so the package should be kept in a cool, dry place and out of the sunlight. Timing is very important. Test for one minute and if +3 wait one more minute and record the darkest portion.

Clinitest tablets are more accurate and are best for insulin users. Put five drops of urine and ten drops of water in test tube. Add the tablet. Do not shake while bubbling. After bubbling ceases shake gently and read. Test takes 15 seconds. Pass through phenonema. Careful observance of test during 15 second waiting period is necessary to detect rapid pass-through color changes caused by amounts of sugar over 2%. Should the color rapidly "pass through" green, tan and orange to a dark greenish-brown record as over 2% sugar.

The patient should understand his condition well enough to ask himself these questions when spilling sugar:

- (a) Diet - Too much? Change of hours?
- (b) Exercise - Change from active days to much less active days?
- (c) Insulin - Incorrect dosage? Change of site because if the same site is used too frequently it leads to thickening of the skin which prevents the insulin from being absorbed by the system at a constant speed.
- (d) Infection or illness such as cough, fever, nausea, vomiting or inflamed wound?

Urine testing and frequency of testing depends upon the doctor and severity of diabetes. If testing once a day, test at different times during the day. Explain double or second voided specimen. This is important especially for the before breakfast test. Those on oral medication may be required to test two or three hours after meals.

	<u>Negative</u>	<u>Trace</u>	<u>+1</u>	<u>+2</u>	<u>+3</u>	<u>+4</u>
<u>Clinitest</u>		¼%	½%	2/3%	1%	2%
<u>Testape</u>			1/10%	1/4%	1/2%	2%

Acetest is a test for Ketones and acetone.

Method for testing for acetone.

Place one drop of urine on an acetest tablet. In 30 seconds compare color of tablet with color chart. Tablets are expensive so do not use indiscriminately. Ketostix are very sensitive and are not used very much.

Acetone bodies are only produced when there is insufficient insulin to use blood sugar for heat and energy. Body turns to the abnormal process of fat metabolism. The biproduct is acetone which is a toxic or poisonous acid. The build-up of these products leads to acidosis or diabetic coma. There is no need to test for acetone every time one tests for sugar.

Criteria for testing for acetone.

- (a) Sugar test shows +3 to +4 regularly for three to four consecutive tests.
- (b) Increased thirst or voiding.
- (c) Feeling ill and when definitely suffering from an illness or infection.

Skin Care

Reason for special precautions is arteriosclerosis which is a normal aging process but diabetics are more prone and should be aware of how to prevent trouble from it. Diabetics are more prone to infections. Special reference should be given to feet as they are farthest away from the blood supply and are more prone to small vessel disease.

Wash the feet daily with warm water and mild soap and dry carefully, particularly between the toes. If feet perspire try mild foot powder. If the skin is dry use lanolin but never between the toes. Trim toe nails after bath but straight across. Do not use scissors or razor on corns or calluses. Wear clean socks or nylons daily. Do not wear garters or tight girdle as it interferes with circulation. Wear proper fitting shoes and break in gradually to avoid blisters. Do not go barefooted. Do not cross legs or at ankles. Do not use hot water bottles or heating pads. Wear socks to bed if feet are cold. If legs are tired elevate even with the hips. Any abrasion, blister, or small cut or bruise should be carefully cleaned with alcohol or diluted Dettol solution and a dry sterile dressing applied. Use scotch tape instead of adhesive tape. Avoid iodine or strong antiseptics. If not improving or getting worse in two or three days see the doctor. Hand cuts are not a problem.

When having dental work done make certain the dentist knows and have the work done in small amounts to avoid missing a meal.

Go to an ophthamologist instead of an optometrist for an eye examination. Glasses should not be fitted for two months after insulin is started as during this period the vision will change. This applies also when out of control.

Exercise

Muscles on exercise burn blood sugar without insulin being required. Doctors never restrict activity because of diabetes but will tell you to try and keep your activity constant from day to day. As this is not always possible the easiest thing to adjust in your routine is your diet.

On the days when you will be more active than usual eat more food. As an example before hiking, swimming or any form of more strenuous exercise have an extra snack to prevent a reaction in the middle of an activity. When you return home test urine and if negative, trace or +1 you probably ate the right amount. If +4 you ate too much. There isn't anything to worry about providing you go back to your regular diet the next day. This is a guide for future activities.

DAY 4: Lecture by NurseInsulin

If your pancreas is not able to produce enough insulin for your daily needs then it has to be given by injection which is usually once a day but sometimes twice. Insulin is made from either beef or pork pancreas. It comes in two concentrations and is measured in units per c.c. Example: 40 units strength or 80 units strength. When doses are over 35 units the 80 unit/cc insulin is used to reduce to half the amount of solution being injected. The Doctor states which you are to use on the prescription. Insulin in use may be kept at room temperature. The extra bottle should be in the refrigerator away from freezing department.

Equipment

Syringes are either 40 units or 80 unit scales. N.B. Buy syringes with one scale only to correspond with your insulin so that there is no chance for confusion and use of incorrect scale which may result in either giving yourself a double dose or half the dose. Glass syringes are reusable. Disposable syringes are convenient for travelling and as an extra in cases of emergency. If using disposable equipment the most economical way to buy is in quantity. There is a newer type of disposable syringe on the market that has vertical labelling, wider scale and a smaller needle. If one has a small hand and on a high dose of insulin there may be difficulty plunging the barrel. Stainless steel needles can be purchased which are reusable until dull. Disposable needles are always sharp and convenient.

Sterilizing Methods

1. Place separated syringe and metal needle (if used) in sieve in sauce pan. Cover with water and boil for five minutes. Lift sieve, pour out water and allow to sit until cool enough to handle. Demonstrate.

2. Keep syringe and needle in 70% alcohol. Tie string around barrel and lower into container which has cotton baton in bottom to protect point of needle.

Change alcohol once a month or more often. Add more alcohol if it evaporates below level of plunger.

Rinse syringe after using and reassemble before returning to alcohol.

Injection Sites

1. Mid thigh in front to mid thigh in back.
2. Above, below and to either side of naval.
3. Upper arm - inner and outer aspect.
4. Hips if able to manage.

Young diabetics are encouraged to use abdomen more often.

N.B. Important to rotate sites from day to day to prevent tissue damage and atrophy of muscle. Areas suggested relatively free of major blood vessels and nerves. When returning to same injection area after two to three days leave at least 1 - 2" between new and old sites.

Irritation if not deep enough.

Types of Insulin

Time actions of insulin, assuming it was given before breakfast. (Shown by X)

<u>Quick Acting</u>	Breakfast	Dinner	Supper	Bed
Toronto)		X lasts approx-		
Regular)		imately 4 hours		
Semi - Lente		X lasts longer		

Medium Acting

N.P.H.			X lasts 24 hrs.	
Lente				
Globin - rarely used				

Long Acting

Protamine Zinc			lasts 36 hrs	X
Ultra Lente				

Mixes Possible

1. N.P.H. and Regular
2. Semi Lente and Lente
3. Semi Lente and Ultra Lente
4. Semi Lente, Lente, and Ultra Lente
5. Lente and Regular

Do not mix Regular and Protomine Zinc. It must be given as two separate injections.

Important to know individual insulin and when it is at its peak of action, because this is when they must eat. i.e. N.P.H. - supper is the largest meal of the day and must be eaten on time or may have reaction.

Injection

Demonstrate holding syringe - different parts. Preparation of Insulin bottle - mixing and cleansing.

Give at right angles to skin.

Cotton used to cleanse skin and bottle top. Buy roll of cotton baton rather than individual balls as it is cheaper.

Mixing - Two Insulins i.e. Regular and N.P.H.

1. Air into N.P.H.
2. Air into Regular)
3. Withdraw Regular) one step.
4. Withdraw N.P.H.

There are two different theories on mixing insulins. Some authorities suggest N.P.H. to be withdrawn first.

N.B. Must be same strength i.e. both 40 units or 80 units.

Oral Tablets

Oral tablets are hypoglycaemic agents. These tablets are not insulin but antidiabetic agents. Two different types are sulfonylureas and biguanides.

Sulfonylurea

- 1) Tolbutamide (trade names Orinase and Mobenol)
- 2) Acetohexamide (trade name Dimelor)
- 3) Chlorpropamide (trade name Diabinese)

Action - stimulates pancreas to produce more insulin. Dosage depends upon the individual.

Biguanides

- 1) DBI (Phenformin)
- 2) DBI-TD

Action - have blood sugar lowering effect independent of insulin. Not used as frequently.

DAY 5: Lecture by NurseDistinguishing Reaction or ComaLow Blood Sugar Reaction

1. Too much insulin
2. Not enough food
3. Unusual amount of exercise
4. Illness - sudden nausea and vomiting
5. New injection site

High Blood Sugar Reaction

1. Omitting or reducing medication
2. Too much food
3. Not enough exercise
4. Infections

SymptomsInsulin Reaction

Onset - sudden

skin - pale, moist, cold

Thirst - absent. Can experience trembling, weakness, headache, numbness, tingling of mouth and fingers

Breathing - normal or rapid and shallow

Behaviour - Excited, confused, loss of memory, belligerent

Vomiting - absent

Vision - impaired

Can become unconscious and have convulsions

Diabetic Acidosis or Coma

- gradual

- flushed, dry often warm

- present, passing urine frequently

- breath, acetone, fruity smell

- drowsy

- present

- impaired

- can drift into coma

TreatmentInsulin Reaction

Food - take something that requires little digestion and will be quickly absorbed into the blood sugar such as sugar, regular pop, sweetened fruit juices, honey, 4-5 lifesavers, chocolate bar, etc.

This is temporary and should be followed by a meal if at mealtime or snack if between meals, e.g. bread, butter and piece of bologna.

Diabetic Acidosis or Coma

If suspected contact your doctor. If alone have somebody stay. To prevent dehydration take fluids - low calorie or no calorie. If nauseated take small amounts of fluid often. Continue usual insulin orders or tablets according to doctor's orders.

Controlled?

How to tell if controlled.

1. How do you feel? If well and not tired, hungry, thirsty, passing urine frequently.

2. Most urine tests should be negative or +1 and at same time not having a lot of reactions.

3. Are you maintaining your weight on a well balanced diet? If on a reducing diet, you should only lose 1-2 pounds a week. If underweight you should only gain 1-2 pounds a week.

4. On a regular doctor's visit your blood sugar should be within a normal range.