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AN EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS
OF A DIABETIC TEACHING TOOL

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by

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B.S.N. McMaster University, 1969

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF
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ABSTRACT

AN EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS
OF A DIABETIC TEACHING TOOL

Judith Mary Skelton

The purpose of this study was to answer the question, 'Will diabetic patients taught by means of a "Diabetic Teaching Tool" demonstrate a higher level of learning about self-care, than patients taught in the institution's usual manner?' The answer to the question was sought by comparing the self-care knowledge and skills of two groups of diabetic patients admitted to a suburban general hospital which, prior to the study, offered no planned programme of diabetic patient education. All diabetic patients admitted to this hospital over a six month period were screened for eligibility to participate in the study according to criteria stated by the researcher. Eligible patients admitted in the first three months were designated as control subjects; those in the last three months as experimental subjects. The twenty subjects in the control group were taught in an unplanned manner, based upon whether and/or what instructions were deemed pertinent by their nurses. A "Diabetic Teaching Tool"--designed by the researcher and administered by each patient's own nurse(s)--was used to instruct the twenty experimental subjects. After discharge, each of the forty subjects was visited by the researcher, at which time a

profile sheet was completed and a test of diabetic learning administered.

Demographic and diabetic characteristics of the subjects--obtained from the patient profile sheets--were analyzed and described in terms of distributions, medians and/or means. The test results were subjected to t-test analyses on several dimensions. And a number of demographic and diabetic traits were compared with their respective test scores by means of the Pearson Product Moment Correlation Coefficient.

The data supported the following conclusions:

1. 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.

2. Statistically significant differences were found between test scores of patients taught with the "Diabetic Teaching Tool" and those receiving unplanned instruction regardless of the duration of their diabetes. Thus 'old' diabetics were able to derive as much benefit from the teaching tool as were 'new' diabetics.

3. The level of learning demonstrated by patients taught with the "Diabetic Teaching Tool" appeared to be independent of the following factors: age at time of teaching and testing, previous education, and age at onset of diabetes; each of these factors was significantly related to the level of learning of patients receiving unplanned instruction.

4. Diabetic patients taught by means of the "Diabetic Teaching Tool" cited the nurse as a valuable source of information regarding diabetic management more than five times as frequently as did patients receiving unplanned instruction.

Based upon these findings, several implications for nursing practice and recommendations for further research were suggested.

(Thesis Chairman)

Other things being equal,
the diabetic who knows
the most will live the
longest.

(Elliott P. Joslin)

TABLE OF CONTENTS

Chapter

I	INTRODUCTION	1
	Significance of the Problem	1
	Statement of the Problem	6
	Specifics of the Study	6
	Hypothesis	6
	Variables	7
	Basic Assumptions.	7
	Limitation	7
	Definition of Terms.	8
II	RESUME OF PRESENT KNOWLEDGE.	9
	Why Should the Diabetic Patient be Taught?	10
	What Should the Diabetic Patient be Taught?	15
	When Should the Diabetic Patient be Taught?	19
	Where Should the Diabetic Patient be Taught?	20
	Who Should Teach the Diabetic Patient?	21
	How Should the Diabetic Patient be Taught?	24
	What variables should be considered?	24
	What diabetic teaching aids are available?	28
	What are the nature and success of current diabetic teaching programmes?	33
III	METHODOLOGY.	40
	The Tools	41
	The Population and the Setting.	43
	The Procedure	44
IV	FINDINGS	48
	Demographic and Diabetic Characteristics of the Population	48

	Age.	49
	Sex.	49
	Marital status	49
	Occupation	49
	Education.	53
	Reason for current hospital admission	53
	Most recent previous hospital admission	53
	Age at onset of diabetes	57
	Duration of diabetes	57
	Type of clinical control	57
	Sources of Information on diabetes management	57
	Scores Achieved on the Test of Diabetic Learning	62
	Correlations between Selected Demographic and Diabetic Characteristics of Subjects and their Respective Test Scores	77
V	SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS.	86
	Summary of the Findings	87
	Demographic and diabetic characteristics	87
	Scores on the test of diabetic learning	88
	Other dimensions	89
	Conclusions	89
	Implications	90
	Recommendations for Further Study	93
	SOURCES CONSULTED.	95
	APPENDIXES	
A	MATERIALS PERTAINING TO THE RESUME OF PRESENT KNOWLEDGE	103
	Instruction of the Patient.	104
	Suggested Topics for Diabetic Teaching	106
	Books for Diabetics	107
	Pamphlets for Diabetics	109
	Diabetic Day Care Centres	110

B	A BASIC COURSE IN DIABETIC SELF- MANAGEMENT	111
	Objectives	112
	Content	115
	Specifications for the Test of Diabetic Learning.	120
C	DATA COLLECTION TOOLS.	121
	Patient Profile Sheet	122
	Test of Diabetic Learning	124
D	DIABETIC TEACHING TOOL	140
	Introduction to the Diabetic Teaching Tool	142
	Contents of the Easel Binder.	144
	Contents of the Carrying Case	245
E	REFERENCES MOST USEFUL IN DEVELOPING THE DIABETIC TEACHING TOOL	290

LIST OF TABLES

Table		Page
I	Comparison of Control and Experimental Patients by Age	50
II	Comparison of Control and Experimental Patients by Sex	51
III	Comparison of Control and Experimental Patients by Marital Status.	52
IV	Comparison of Control and Experimental Patients by Education	54
V	Comparison of Control and Experimental Patients by Reason for Current Admission to Hospital	55
VI	Comparison of Control and Experimental Patients by Most Recent Previous Hospital Admission.	56
VII	Comparison of Control and Experimental Patients by Age at Onset of Diabetes. . .	58
VIII	Comparison of Control and Experimental Patients by Duration of Diabetes.	59
IX	Comparison of Control and Experimental Patients by Type of Diabetic Control. . .	60
X	Comparison of Control and Experimental Pill-users by Score on Knowledge Test . .	63
XI	Comparison of Control and Experimental Insulin-users by Score on Knowledge Test.	64
XII	Comparison of Control and Experimental Patients by Score on Diet Planning Skill Test	65
XIII	Comparison of Control and Experimental Patients by Score on Urine Testing Skill Test.	66

XIV	Comparison of Control and Experimental Insulin-users by Score on Insulin Injecting Skill Test.	68
XV	Comparison of Control and Experimental Patients by Score on Knowledge and Skill Tests regarding Diet.	69
XVI	Comparison of Control and Experimental Patients by Score on Knowledge and Skill Tests regarding Urine Testing . . .	71
XVII	Comparison of Control and Experimental Insulin-users by Score on Insulin Knowledge and Skill Tests	72
XVIII	Comparison of Control and Experimental Pill-users by Total Percentage Score on Test of Diabetic Learning	73
XIX	Comparison of Control and Experimental Insulin-users by Total Percentage Score on Test of Diabetic Learning.	74
XX	Comparison of Control and Experimental Patients by Total Percentage Score on Test of Diabetic Learning	76
XXI	The Relationship between Age at Testing and Total Percentage Score.	78
XXII	The Relationship between Education and Total Percentage Score.	80
XXIII	Comparison of Total Percentage Scores of all Patients by Reason for Current Admission to Hospital	82
XXIV	The Relationship between Age at Onset of Diabetes and Total Percentage Score. .	83
XXV	The Relationship between Duration of Diabetes and Total Percentage Score . . .	85

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CHAPTER I

INTRODUCTION

Significance of the Problem

Diabetes is a common condition, and in Canada it affects an estimated 300,000 people; possibly [an additional] 300,000 are undiscovered . . . When found early, it can be controlled . . . When overlooked, diabetes can smolder, causing serious complications without the patient's knowledge; that is why everyone should learn something about the condition, and why known diabetics should learn everything about it.¹

Throughout the world, morbidity and mortality statistics indicate that the prevalence of diabetes mellitus² is rising.³ A number of reasons have been suggested to explain this trend. Life expectancy in general is increasing. Therefore more diabetics are being diagnosed. Improvements in medical care--not the least of which was the discovery of insulin--not only have lengthened the lifespan of older diabetics, but also have allowed younger diabetics to marry and bear children, thus increasing the number of infants with an inherited predisposition to the disease. Moreover, obesity, an important factor

¹ "Manual for Diabetics in Canada" (Toronto: The Canadian Diabetic Association, 1970), 7.

² Hereafter, the word 'diabetes' will connote 'diabetes mellitus' and not 'diabetes insipidus'.

³ Paul S. Entmacher and Herbert H. Marks, "Diabetes in 1964: A World Survey," Diabetes, XIV, No. 4 (April 1965), 212.

associated with diabetes, is also increasing. In addition, the reported relationships between diabetes and other etiological variables have led to earlier detection of many cases.⁴

Whatever the causes, the result is a situation which is urgent. Success in the treatment of diabetes today depends to a large degree on the instruction of the patient in the management of the disorder under the conditions of his home life, his work and his other activities.⁵ At the same time, there has emerged a trend to centre responsibility for that instruction with the patient rather than with his doctor or nurse. This trend is evidenced by such statements as: "He, himself, will be the helmsman";⁶ "It's up to you";⁷ and, "The future is in your hands."⁸ The ultimate message contained in these statements is unquestionably valid. In the final analysis it is the patient himself who will make or break his treatment regime. However, the onus on health professionals to make a comprehensive job of health teaching is nonetheless profound. That they have been less than successful in this endeavour to date is illustrated by such

⁴ Max Ellenberg and Harold Rifkin, Diabetes Mellitus: Theory and Practice (Toronto: McGraw Hill, 1970), p. 590.

⁵ Editorial, "Teaching Diabetic Self-Care," New England Journal of Medicine, CCLXXVI (January 1967), 182.

⁶ Garfield George Duncan, Diabetes Mellitus: Principles and Treatment (Philadelphia: W. B. Saunders Co., 1951), p. 103.

⁷ Getting Started (Rutherford, New Jersey: Becton-Dickinson Company, n.d.), 5.

⁸ "A Guide for the Canadian Diabetic on Oral Therapy" (Toronto: Eli Lilly and Company (Canada) Ltd., n.d.), 4.

observations as those noted in the next paragraph.

A public health nurse in Toronto described the following two cases of inadequate patient knowledge regarding insulin injections:

1. A patient was injecting her insulin into an orange each day, and eating the orange.
2. Another patient was driving his needle through the metal protector on his insulin bottle when preparing his injections.

Both of these patients had recently been discharged from a hospital which had a diabetic teaching programme.⁹ Stone reported that sixty-two per cent of 160 diabetic patients studied to determine the degree of control and the factors influencing this were poorly regulated. The most common cause for poor control was failure to adhere to diet. Many patients failed to follow their diets simply because they did not understand them. Forty per cent of these patients were able to achieve good control after further instruction.¹⁰ Similar findings were reported by Etzwiler.¹¹

Some more recent studies seem to contradict the above findings by showing an inverse relationship between diabetic

⁹ Anecdotes recounted by a public health nurse to a group of student nurses.

¹⁰ Daniel B. Stone, "A Study of the Incidence and Causes of Poor Control in Patients with Diabetes Mellitus," American Journal of Medical Science, CCXLI (July 1961), 438.

¹¹ Donnell D. Etzwiler, "Who's Teaching the Diabetic?" Diabetes, XVI, No. 2 (February 1967), 111-117.

knowledge and control.^{12, 13, 14} Such studies are initially discouraging, and health professionals are tempted to ask "Why bother?" Some answers to this question are suggested by these same authors:

Biological factors, still insufficiently understood, are probably of great importance in determining control.¹⁵

Although we now think that factors other than 'what they know' and 'what they do' may be important in controlling the disease, we still think that it is important for the patient to apply all available knowledge in the management of his disease.¹⁶

The critical implication of these findings is that to know the facts about diabetes is not in itself the alpha and omega of diabetes patient education . . . the educational needs of these patients extend beyond the point of merely possessing facts. An educated patient . . . is one who is able to make the right decisions on the basis of the facts and is motivated from within to strive toward the best possible use of the facts he possesses.¹⁷

The problem, then, becomes less one of 'should we teach?' and more one of 'how can we better our teaching?' Krysan has

¹² Edward V. Ellis, "A Comparative Analysis of Good, Poor and Very Poor Control in Diabetic Patients as a Basis for Determining Educational Needs" (unpublished Doctoral dissertation, University of North Carolina at Chapel Hill, 1964).

¹³ Julia D. Watkins, "A Study of Diabetic Patients at Home," American Journal of Public Health, LVII, No. 3 (March 1967), 452-459.

¹⁴ T. Franklin Williams and Dan A. Martin, "The Clinical Picture of Diabetic Control Studied in Four Settings," Diabetes, XIV, No. 7 (July 1965), 469.

¹⁵ Ibid.

¹⁶ Watkins, "Diabetic Patients at Home," 453.

¹⁷ Ellis, "Control as a Basis for Educational Needs," 215-216.

stated it this way: "How can we improve and extend the training programs of such great numbers of patients?"¹⁸ In partial response to this question, Krysan identified the following starting place:

First we must decide what teaching services we can provide to persons with diabetes. Generally these services fall into four categories: assessment and counselling; teaching self-care; co-ordinating community services; and follow up.¹⁹

Of these four, the one most clearly within the realm of nursing is the teaching of self care. While it is true that a number of diabetic treatment centres are currently experimenting with having the nurse assume a key role in the assessment, counselling and follow-up of patients,^{20, 21, 22} such programmes are the exception rather than the rule. Similarly, while some nurses might be capable of assuming responsibility for co-ordinating community services for diabetics, most would not. Regardless of whether or not the nurse expands her functions to include assessment, counselling, co-ordination and follow-up of diabetic patients, she will almost certainly retain a primary role in their initial and ongoing health

¹⁸ Germaine S. Krysan, "How do We Teach Four Million Diabetics?" American Journal of Nursing, LXV, No. 11 (November 1965), 105.

¹⁹ Ibid.

²⁰ Diabetic Day Care Centre, Lions Gate Hospital, North Vancouver, B. C.

²¹ Diabetic Clinic, McMaster University Health Sciences Complex, Hamilton, Ont.

²² Judith D. Jordan and Joseph C. Shipp, "The Primary Health Care Professional was a Nurse," American Journal of Nursing, LXXI, No. 5 (May 1971), 922-925.

teaching. For this reason, it was decided to concentrate this study on "teaching self-care," and to attempt to devise one method by which nurses could provide that service to diabetic persons.

Statement of the Problem

The purpose of this study was to answer the question, 'Will diabetic patients taught by means of a "Diabetic Teaching Tool" demonstrate a higher level of learning about self-care than patients taught in the institution's usual manner?' The answer to the question was sought by comparing the self-care knowledge and skills of two groups of diabetic patients. One group, the control group, received whatever teaching the institution normally provided. The second group, the experimental group, was taught by means of a "Diabetic Teaching Tool" which was designed by the author and administered by each patient's own nurse(s). After discharge, each patient was asked to respond to a number of questions and to perform several skills designed to evaluate his learning regarding self care.

Specifics of the Study

Hypothesis

The hypothesis of this study was as follows: 'there is no significant difference in the learning of patients in the experimental group as compared with patients in the control group.'

Variables

The independent variable in this study was the "Diabetic Teaching Tool", which was utilized by each patient's own nurse or nurses, to teach him about self-care.

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

Basic Assumptions

This study rested on two basic assumptions. The first of these--that diabetic patients require special learning to manage their self-care at home--was introduced in the discussion of the significance of the problem. It has been further documented in the resume of present knowledge (Chapter II) under the heading 'Why Should the Diabetic Patient be Taught?' The second assumption--that nurses have a role in the teaching of diabetic patients--was based on the fact that most, if not all, nursing educators include the function of health teaching as part of the nursing role.

Limitation

Because the "Diabetic Teaching Tool" and its use in this study does not take into consideration many of the variables²⁴ which predispose different patients to respond in different ways to different nurses on different occasions, caution must be used in generalizing results of this study to other settings.

²⁴ See discussion of learner, teacher and environmental variables, Chapter II.

Definition of Terms

Diabetic Teaching Tool: refers to that tool designed by the researcher and included in Appendix D of this study.

Patient learning: refers to the score achieved by the patient on the test found in Appendix C of this study.

Graduate nurse: refers to any nurse who has been employed as a graduate by the institution through which this study was conducted.

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

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

Unplanned instruction: refers to teaching which a given graduate nurse may or may not deem pertinent to a given diabetic patient. The decision as to the appropriateness and content of unplanned instruction rests with this nurse.

CHAPTER II

RESUME OF PRESENT KNOWLEDGE

Because literature pertaining to the many facets of diabetes and patient teaching is so abundant, the author has elected to present this information in the following manner:

1. That literature which forms the framework upon which the present study is built is reviewed in the main text of the thesis. This information is organized in response to the questions

- (a) Why should the diabetic patient be taught?
- (b) What should the diabetic patient be taught?
- (c) When should the diabetic patient be taught?
- (d) Where should the diabetic patient be taught?
- (e) Who should teach the diabetic patient?
- (f) How should the diabetic patient be taught?

2. That literature which was utilized in selecting and organizing the content of the "Diabetic Teaching Tool" is credited in a separate bibliography. (The tool and its selected bibliography may be found in Appendix D and Appendix E respectively.)

Why Should the Diabetic Patient be Taught?

Other things being equal, the diabetic who knows the most will live the longest.¹

The above quotation was characteristic of the teachings of Elliott P. Joslin, a world leader in the treatment of diabetes for some 60 years. Throughout his writings, Dr. Joslin's conviction is frequently reiterated, namely, if the diabetic individual "studies the disease and becomes master of his fate"² he will live a long and happy life. Dr. Joslin advocated a rather strict (by current standards) regime for his diabetic patients, and maintained firmly that this regime, in combination with extensive patient education, would lead to good control and absence of complications.³

The study by Stone⁴ in 1961 gave experimental credence to Dr. Joslin's beliefs. Stone studied 160 patients with diabetes in an attempt to determine the degree of their

¹ Quoted in the preface to John William Caldwell, Understand Your Diabetes (Toronto: Oxford University Press, 1949).

² Elliott P. Joslin, Diabetic Manual (Philadelphia: Lea and Febiger, 1959), preface.

³ Ibid.

⁴ Daniel B. Stone, "A Study of the Incidence and Causes of Poor Control in Patients with Diabetes Mellitus," American Journal of Medical Science, CCXLI (July 1961), 439.

control and the factors influencing this control.⁵ He concluded from his research that poor control could not be ascribed to inherently "unstable" diabetes, but was a function of a variety of factors including social difficulties, emotional problems, refusal to attempt regulation, and--most significant--failure to adhere to diet due to inadequate knowledge thereof. Reassessment, followed by appropriate instructions and treatment, brought about the following alteration in degree of control:

	Before Intervention	22-28 months after Intervention
Good Control	21%	53%
Fair Control	17%	11%
Poor Control	62%	36%

More recent studies have, however, resulted in conflicting findings. Perhaps the most controversial of these was a description of "The Clinical Picture of Diabetic Control

⁵ Degree of control in this and other similar studies is determined by
 (a) deviation of the patient's weight from his optimal level;
 (b) frequency of blood sugar levels above normal;
 (c) frequency of urine sugar levels greater than 1%; and
 (d) frequency of episodes of diabetic acidosis.
 Generally speaking, the lower the incidence of these four factors, the better the control.

Studied in Four Settings" by Williams and Martin.⁶ A total of 213 patients were interviewed, their medical records examined and their degree of control judged by objective criteria. Overall, twenty-nine per cent of the subjects were in acceptable control, seventy-one per cent in less than acceptable control. Significant correlations with poor control included: early age at onset, high knowledge about diabetes, large household size, and presence of major social problems. Significant correlations with good control included: patient preference for a strict versus a lenient physician, and satisfaction of the patient with his physician, of whatever type. From these data, the authors concluded that "lack of knowledge about diabetes is infrequently the cause of poor control."⁷

About the same time, in a study conducted in two metabolic clinics, Ellis found a similar pattern.

The view held by some that all the diabetic needs are the facts about diabetes and that this will lead to good control was not substantiated by the findings of this study . . . [among the patients evaluated] there was an inverse relationship between knowledge about diabetes and level of diabetes control.⁸

⁶ T. Franklin Williams and Dan A. Martin, "The Clinical Picture of Diabetic Control Studied in Four Settings," Diabetes, XIV, No. 7 (July 1965), 469.

⁷ Ibid.

⁸ Edward V. Ellis, "A Comparative Analysis of Good, Poor and Very Poor Control Diabetic Patients as a Basis for Determining Their Educational Needs," (unpublished Doctoral dissertation, University of North Carolina at Chapel Hill, 1964), 213.

Ellis discusses this result at some length, and cautions the reader that

Because poor and very poor control patients knew more about diabetes than good control patients, it does not necessarily mean that a little knowledge is a dangerous thing. The findings imply that the educational approach to the patients . . . should be in terms not only of acquiring facts but also developing skilled or intelligent action or behaviour.⁹

Both sides of the coin have been examined. 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. This was dramatically illustrated in a study by Watkins,¹⁰ in which sixty patients were rated on management of insulin, urine tests, diet and foot care. Forty-eight of these patients had "unacceptable" practice in administering insulin; thirty-one made errors in insulin dosage; twenty-seven used urine tests in a way which would probably affect control adversely; forty-four had meals and spacing of meals unacceptable for diabetics; thirty-one carried out poor foot care. In general, those who knew more managed better. Watkins' study stands as a challenge to all health professionals concerned with health teaching.

⁹ Ibid., 215.

¹⁰ Julia D. Watkins, "A Study of Diabetic Patients at Home," American Journal of Public Health, LVII, No. 3 (March 1967), 458.

In 1962 the American Diabetes Association announced its stand on patient health teaching in this statement:

Because of its prevalence and chronicity, diabetes mellitus should be the continuing concern of all physicians, regardless of their types of practice. An essential part of treating the condition is teaching the patient how to live with it.

As in any educational program, a systematic approach should be used. Each physician should have certain specific objectives clearly in mind as he teaches his diabetic patients.

To aid him, the American Diabetes Association has prepared . . . a check list of 9 elements of treatment, which constitutes a minimum program for diabetes management.¹¹

Surely these admonitions have as much relevance for nurses as they have for physicians!

In conclusion, to the question, 'Why teach the diabetic patient?' - the reply is this:

Successful management of a chronic disorder depends not only on the treatment prescribed by the physician, but also on the instruction given the patient to enable him to follow directions and to prepare him to meet changing conditions, including possible emergencies. Education of the patient with diabetes can be vitally important: it not only can ensure success in restoring and maintaining his health but also may be the means of saving his life.¹²

¹¹ George J. Hamwi, "Special Announcement: Treatment of Diabetes," Journal of the American Medical Association, CLXXXI (September 22, 1962), 1064.

¹² Frank N. Allan, "Education of the Diabetic Patient," New England Journal of Medicine, CCLXVIII (January 10, 1963), 93.

What Should the Diabetic Patient be Taught?

Prior to the American Diabetes Association statement in 1962, which outlined a minimum curriculum for diabetes patient education,¹³ very little in the way of concrete guide-lines for the health educator had been written. Certainly, the importance of teaching was recognized, but what (of the limitless knowledge of diabetes) to teach, was left pretty much to the discretion of the individual physician or nurse. One notable exception to this was the section in Duncan's text of diabetes entitled, "Instruction of the Patient."¹⁴

By virtue of their inclusion in various texts for diabetics, a wide range of topics has been suggested as appropriate and/or necessary for diabetic learning.¹⁵

The variety of texts available (both from the point of content, and that of reading-level difficulty) has provided direction for many patients over the years. However, it has left the health educator confused as to where to begin and how far to go. The American Diabetes Association statement provided direction in this matter, by preparing the following checklist of nine elements of treatment which constitute a

¹³ Hamwi, "Announcement," 1064.

¹⁴ Garfield George Duncan, Diabetes Mellitus: Principles and Treatment (Philadelphia: W. B. Saunders Co., 1951), pp. 170-171. A copy of this proposed teaching outline may be found in Appendix A of this study.

¹⁵ These topics have been summarized in a table in Appendix A of this study.

minimum programme for diabetes teaching,¹⁶

1. Diet.
2. Urine testing.
3. Action of insulin and other hypoglycemic agents.
4. Technique of insulin injection and sites for it.
5. Care of syringe and of insulin.
6. Symptoms of hypoglycemia.
7. Symptoms of uncontrolled diabetes.
8. Care of the feet.
9. What to do in case of acute complications.

Shortly after this statement was published, and in direct reference to it, Allan wrote:

The physician who intends to make his instruction thorough should see that the patient has learned about each of these nine points relating to therapeutic measures, techniques of treatment, symptoms resulting from neglect of treatment and from over-treatment, prophylactic precautions and emergencies.¹⁷

He followed this admonition with a clear, yet brief, discussion of what might be covered under each of those nine headings.

Krysan touched on very similar points in an article designed to guide the nurse in choosing 'what' to teach.¹⁸ The main areas she emphasized were: diet, medication, exercise and their interrelationships, urine testing, hypo- and hyper-glycemia, and hygiene.

So far 'what to teach' has been presented from the standpoint of health professionals. How do the patients feel about

¹⁶ Hamwi, "Announcement," 1064.

¹⁷ Allan, "Education," 94.

¹⁸ Germaine S. Krysan, "How do We Teach Four Million Diabetics?" American Journal of Nursing, LXV, No. 11 (November 1965), 105-107.

this? Ellis asked precisely this question in "A Comparative Analysis of Good, Poor and Very Poor Control Diabetic Patients as a Basis for Determining Educational Needs." In order to assess whether or not there was agreement between diabetic patients and health authorities on content areas that should be included in patient education, Ellis asked his subjects to check which of twelve given items they felt were important for them to know in order to control their diabetes.¹⁹ The seven content areas generally considered to be essential to good management, in contrast to the other five which were not felt to be as important, are indicated by asterisks:

- * 1. When it is important to see the doctor.
- 2. Effect of glands on diabetes.
- * 3. How to measure and give insulin.
- 4. Kinds of people most likely to get diabetes.
- * 5. How to take care of feet.
- 6. Historical facts about diabetes.
- 7. The hereditary nature of diabetes.
- * 8. How to recognize and avoid insulin reactions.
- * 9. When and how to test urine for sugar.
- *10. Kinds of foods to eat and not to eat.
- 11. Community agencies to help diabetics.
- *12. How to balance exercise and activity with insulin.

Thus it is apparent that there is fairly high agreement on topics of significance.

But what about the weighting of these items? Watkins and Moss²⁰ attacked this question by attempting to identify those areas of management that patients find most confusing.

¹⁹ Ellis, "Control as a Basis for Educational Needs," 150.

²⁰ Julia D. Watkins and Fay T. Moss, "Confusion in the Management of Diabetes," American Journal of Nursing, LXIX, No. 3 (March 1969), 521-524.

They reported the following sources of confusion:

1. Insulin Administration: the variety of syringes and insulins available; the sterilization process.
2. Urine Testing: which specimen is to be tested; how to use the prescribed test; how to read the test.
3. Diet: converting a meal plan into day-to-day eating habits; exchange lists.

It would seem reasonable, therefore, to weight these three items more heavily than others in both the planning and execution of patient teaching.

Briefly, then, one might answer the question 'What should the diabetic patient be taught?' by stating that a minimal basic course should be constructed around the nine elements outlined by the American Diabetes Association. Serious consideration should be given to two additional items which diabetic patients have indicated are important:

1. When it is important to see the doctor or other health professional; and
2. How to balance exercise and activity with insulin.

Weighting of the programme should be such that principles of insulin administration, urine testing and diet receive sufficient attention to minimize confusion in their application.

When Should the Diabetic Patient be Taught?

Much has been written on the importance of beginning diabetic teaching at the earliest opportunity. Hamwi stated:

The optimum time for the education of the patient in relation to a chronic illness, such as diabetes mellitus, is when it is originally diagnosed. At this time the patient will be far more receptive than if the same information is presented to him after several years, during which period he has been uninformed about many of the basic principles of control.²¹

Allan²² and Ricketts²³ both supported Hamwi's stand.

As commendable as these directives are, initial teaching is not enough. The diabetic patient is struggling daily with an unnatural regimen of prescribed meals, hypodermic needles, urine tests, and all of the other restrictions implied by his disease. The tendency to grow careless and take liberties increases as time goes on.²⁴ This was clearly illustrated in Watkins' study of diabetic patients at home in which she found the longer patients had had their disease, the more insulin errors they made.²⁵

²¹ Hamwi, "Announcement," 1064.

²² Allan, "Education," 95.

²³ Henry T. Ricketts, Diabetes Mellitus: Objectives and Methods of Treatment (Springfield: C. C. Thomas, 1955), pp. 21-22.

²⁴ Ibid., p. 42.

²⁵ Watkins, "Diabetic Patients at Home," 458.

Similar findings resulted from a survey, conducted by the Diabetes Program of the New Jersey State Health Department, of the educational needs of diabetics. Reports were submitted by public health nurses from twenty-seven agencies. The nurses reported that in one-third of the cases, theirs had been the first instruction which the patients had received. Moreover, of the two-thirds who had had previous teaching, a distressingly high percentage had forgotten or had not understood clearly, and required retraining.²⁶ This study clearly pointed up the need for an on-going programme of follow-up, reassessment, and continuing education.

Etzwiler has summarized this problem:

All too frequently patient education is regarded as the in-patient training provided during the initial hospitalization. During this admission the patient and his family may be so overwrought by the discovery of this chronic disease that they may comprehend very little in the teaching sessions. Older adults may have difficulty understanding the nature of their disease and, once learned, many quickly forget. Thus diabetic education must not be considered a one-shot program carried out in the hospital. It must be a continued review and teaching program . . .²⁷

Where Should the Diabetic Patient be Taught?

If, as the above studies indicate, in-hospital teaching is falling short of meeting diabetic patients' learning needs,

²⁶ Arthur Krosnick and Edward T. Harris, "There Must be Follow-Up," Public Health News (New Jersey), XLIII (November 1962), 348-350.

²⁷ Donnell D. Etzwiler, "Who's Teaching the Diabetic?" Diabetes, XVI, No. 2 (February 1967), 117.

where should this instruction take place? The answer to this question seems to be, 'wherever it can be arranged.' Krysan²⁸ has suggested that nurses may be involved in diabetic instruction in any of the following settings: hospital, nursing home, clinic, physician's office, school, industry and/or patients' homes.

In addition, diabetic day care centres²⁹ are becoming increasingly popular. Although they are usually based in hospitals, most diabetic day care centres are designed to provide the service of diabetic education to all members of the community, whether they be in-patients or out-patients, 'new' or 'old' diabetics, or merely concerned individuals. Such centres show real promise as one answer to the question, 'where should the diabetic be taught?'

Who Should Teach the Diabetic Patient?

Historically, the three major categories of personnel involved in diabetic teaching have been physicians, nurses and dietitians. Various studies have indicated that none of these groups is fulfilling this responsibility as effectively as it might. One might ask 'why not?' Regarding physicians Hamwi suggested that:

Contributing to the inadequate education of the individual with diabetes mellitus is the fact that

²⁸ Krysan, "How do We Teach?" 105-107.

²⁹ Diabetic Day Care Centres: Current Concepts (Rexdale, Ontario: Ames Company, Division Miles Laboratories Limited, 1969).

many physicians see few if any patients each year in whom the diagnosis has been established. It is obvious that, under these circumstances, much of the basic knowledge required to provide adequate education will have been forgotten by these physicians through lack of utilization.³⁰

Furthermore, Etzwiler reported that follow-up studies of diabetes detection drives indicated that not all physicians knew what steps ought to be taken when a patient was reported to be a "suspected diabetic":

If these responses are indicative of these physicians' general knowledge of diabetes, [Etzwiler suggests] it would seem prudent that doctors who are not well informed about diabetes or are unwilling to spend the necessary time participating in patient education should refer these patients whenever possible.³¹

Unfortunately, nurses and dietitians did not fare any better than physicians in Etzwiler's investigation. A thirty-five item multiple choice test administered to 289 graduating senior nursing students revealed a significant lack of information concerning basic concepts of diabetes itself as well as of fundamental nursing procedures related to the disease.³² The basic reason suggested for this outcome is the current trend among nursing schools to move away from disease-oriented instruction in favour of a more generalized approach to nursing care. Nevertheless, Etzwiler emphasizes:

³⁰ Hamwi, "Announcement," 1064.

³¹ Etzwiler, "Who's Teaching the Diabetic?" 116-117.

³² Ibid.

The prevalence of diabetes demands that, regardless of their field of interest, all nursing personnel should be familiar with this condition and its management.³³

Ninety-five members of the American Dietetic Association were asked to complete the same questionnaire. The results suggested that their knowledge also was inadequate to deal effectively with diabetic patients.³⁴

Thus it would seem that the average physician, nurse and dietitian are not qualified to teach diabetic patients. Etzwiler recommended, therefore, that instruction be conducted by a co-ordinated team of interested and knowledgeable personnel from all three fields.³⁵ This proposal is, of course, the foundation upon which diabetic day care centres are being organized.

However, it is important to be realistic about this problem. At present, in North America, the number of diabetic day care centres is not adequate to meet the teaching needs of this continent's five million diabetics.³⁶ Therefore the majority of these people still depend on the staff of our general hospitals to fulfil their learning needs. In these settings, the answer to the question 'who should teach?' must be 'everyone who is able.'

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

³⁶ This figure an approximation based on a 250 million population and a 1:50 incidence of diabetes.

How Should the Diabetic Patient be Taught?

The question of how the diabetic patient ought to be taught is a many-faceted one. In order to attempt an answer, one must examine not only the variables which interplay in any teaching-learning situation, but also the teaching aids and variety of programmes available for diabetic instruction. Hence each of these facets has been considered separately in the following discussion.

What variables should be considered?

The variables to be considered in a given teaching-learning situation are of three types: learner variables, teacher variables, and environmental variables.

Learner variables.--Ellis has done what is probably the single most exhaustive investigation of learner variables. In his study extensive research was carried out regarding cultural and psycho-social factors as well as the perceptions held by diabetic patients regarding their own needs.³⁷ A definite pattern emerged. Patients in poor or very poor clinical control were likely to have had their diagnosis of diabetes established before thirty years of age. They were, moreover, likely to be young, male and white, with a high level of formal education and a high level of living. These patients, surprisingly, usually had a high level of knowledge

³⁷ Ellis, "Control as a Basis for Educational Needs," 9.

about diabetes, a high level of knowledge about diabetic problem situations, and high agreement with health authorities on the content areas that should be taught to diabetic patients. And finally, the poor or very poor control patients tended to express independent attitudes toward life situations in general.³⁸ Quite a different pattern characterized the good control patients in this study.

Several authors have suggested that poorer clinical control in diabetics is positively related to pathological psychiatric classifications in such areas as dependence-independence balance, self-percept, and manifest and latent anxiety. While the majority of these studies were of child diabetics, ^{39, 40, 41, 42} Murawski's research indicated that such findings might also be applicable to the adult. In order to describe the personality patterns of patients with diabetes of long duration, Murawski administered the Minnesota Multiphasic Personality Inventory to 112 patients who had been diabetic for 25 to 48 years. Of these subjects, 67 had been

³⁸ Ibid., 189-190.

³⁹ Charles R. Swift et al., "Adjustment Problems in Juvenile Diabetes," Psychosomatic Medicine, XXIX (November-December 1967), 555-571.

⁴⁰ Arthur Krosnick et al., "Adjustment Problems and Quality of Control in Juvenile Diabetes," Diabetes, XV, No. 7 (July 1966), 538.

⁴¹ John Birkbeck et al., "Emotional Disturbances in Juvenile Diabetics," Diabetes, XVII, No. 5 (June 1968), 317-318.

⁴² Maija-Liisa Koski, "The Coping Processes in Childhood Diabetes," ACTA Paediatrica Scandinavica (1969), Supplement 198.

awarded the Quarter Century Victory Medal, having been found free of vascular complications after twenty-five years or more of diabetes. The data showed that significantly more non-medal patients had abnormal scale scores than did the medal winners.⁴³

These results would seem to suggest that labile diabetes, manifested in poor clinical control, often results in psychiatric pathology. However Groen--in a discussion of the psychosomatic aspects of diabetes--cautioned against such a conclusion, pointing out that certain psycho-traumatic life situations, leading to feelings of depression, loneliness and/or not being understood, may play a part in the multifactorial etiology of the condition.⁴⁴ Therefore it cannot be said that one is cause and the other effect but rather only that the two factors--poor clinical control and psychological instability--are related.

Regarding social variables, the Diabetes Supplement of the National Health Survey conducted in the United States in the fiscal year 1964-65 showed considerably lower income and lower educational levels for diabetic patients than for the general population.⁴⁵

⁴³ Benjamin J. Murawski et al., "Personality Patterns in Patients with Diabetes of Long Duration," Diabetes, XIX, No. 4 (April 1970), 259-263.

⁴⁴ Johannes J. Groen, "Psychosomatic Aspects of Diabetes Mellitus," Diabetologia, IV, No. 6 (November-December 1968), 391.

⁴⁵ Glen W. McDonald, "The Diabetes Supplement of the National Health Survey," Journal of the American Dietetic Association, LII, No. 2 (February 1968), 119.

The above survey of the literature indicates that there are many learner variables--abilities, capacities, physical limitations, attitudes, interests, previous learning and class or group characteristics--which should be considered in deciding 'how' to teach the diabetic patient.

Teacher variables.--Each teacher has a unique social, psychological, emotional and cultural profile which will influence his/her ability to interact with a given diabetic patient. Included in this profile are such variables as abilities, motivation, physical limitations, self-concept adjustment, attitudes, values and interests.⁴⁶ While there is ample research pertaining to these factors in the general education literature, none was found relating specifically to the teacher of diabetic patients.

Environmental variables.--On the other hand, environmental variables embrace such things as the teaching-learning community (or setting), aims and content of the instruction, teaching resources or aids employed, and teaching methods and techniques.⁴⁷ The setting has already been discussed in answer to the question 'where should the diabetic patient be taught?' Aims and content of instruction were treated under the heading 'what should the diabetic be taught?' Ellis' study shed some light on the matter of teaching techniques. Patients in this study identified the following as preferred instructional procedures for

⁴⁶ Professional Teacher Education (Washington, D. C.: American Association of Colleges for Teacher Education, 1968), 8.

⁴⁷ Ibid.

teachers:

1. Use of non-medical words;
2. Stating exactly what to do and what not to do;
3. Allowing more time for instructions;
4. Providing opportunity to practice instructions;
5. Teaching one thing at a time;
6. Adjusting instructions to personal needs; and
7. Making special considerations for those who have other physical problems.⁴⁸

What diabetic teaching aids are available?

As noted in the preceding section, teaching aids and resources may be considered to be one of the environmental variables affecting learning. However, such a variety of assistance is available for diabetic teaching that it will be treated here in a separate discussion.

Books and pamphlets.--Perhaps the most traditional of diabetic teaching aids are a number of books written for diabetics.⁴⁹ Supplementing these publications are several pamphlets distributed by diabetic associations and drug companies.⁵⁰ There can be little doubt that these and other printed materials, used in conjunction with personal teaching,

⁴⁸ Ellis, "Control as a Basis for Educational Needs," 238-239.

⁴⁹ The best known books for diabetics are listed in Appendix A, together with excerpts from book reviews about them.

⁵⁰ A chart summarizing titles, sources and costs of several diabetic pamphlets may be found in Appendix A.

are important factors in diabetic education. But they have their limitations.

If the patient is to benefit from printed aids, he must be able to understand them. Unfortunately, all too often this is not the case. Instructional material is misinterpreted, misunderstood, or confused because authors fail to write understandably and readers are unable to read with adequate comprehension.⁵¹

Thrush and Lanese investigated that aspect of the problem relating to authors' failure to write understandably. Sampling the diabetic literature of twenty-one teaching hospitals across the United States, they computed the median grade level and found it to be slightly above a ninth grade reading difficulty. They compared this finding with United States census data, which showed that over half of the national diabetic population above forty-five years of age has not completed nine years of schooling.⁵² Further investigation indicated that a small number (198) of unfamiliar words contributed disproportionately to raising the reading difficulty of the literature. The authors suggest that familiarity with or deletion of these words would lower the reading score some four school grades.⁵³ Mohammed added to these suggestions those of

⁵¹ Rudolph S. Thrush and Richard R. Lanese, "The Use of Printed Material in Diabetes Education," Diabetes, XI, No. 2 (March-April 1962), 132.

⁵² U. S. Bureau of the Census, Statistical Abstract of the U.S., 1955 (Seventy-sixth Edition) (Washington, D.C., 1955), p. 112.

⁵³ Richard R. Lanese and Rudolph S. Thrush, "Measuring Readability of Health Education Literature," Journal of the American Dietetic Association, XLII, No. 3 (March 1963), 217.

keeping sentence length short, and avoiding subtlety and symbolism.⁵⁴

It is apparent from these studies that much effort is yet required to render diabetic books and pamphlets truly valuable to their consumers. Fortunately, some progress has been made with other teaching aids.

Recordings.--In 1957 Schmitt described advantages of taped lectures for diabetic instruction.⁵⁵ Today, several tape recorded speeches may be borrowed from the Canadian Diabetic Association library for use in rural areas where it is difficult to secure competent speakers. Becton-Dickinson Company has co-ordinated a cassette tape and graphic book in Getting Started, an orientation programme for the diabetic patient.⁵⁶ While this programme is not a replacement for personal-contact education, it does offer distinct advantages:

1. It is easy to use anywhere;
2. The patient regulates his own intake;
3. The material is uncomplicated;
4. It is time-saving for staff; and
5. Extra teaching aids may be used in conjunction with it.⁵⁷

Similar advantages attend "What is Diabetes?" a film strip and record programme put out by Trainex Company of California.

⁵⁴ Mary F. Bucklin Mohammed, "Patients Understanding of Written Health Information," Nursing Research, XIII (Spring 1964), 100-103.

⁵⁵ George Frederick Schmitt, "Method of Teaching Diabetic Patients," Journal of the Florida Medical Association, XLIII (March 1957), 894.

⁵⁶ Getting Started (Rutherford, New Jersey, 1971).

⁵⁷ Ibid., guide to the kit.

Films.--More sophisticated audio-visual materials are available in the form of 16 mm. films from the Canadian Diabetic Association film library. These films are produced by the Association itself, and by various pharmaceutical companies. One of the best films currently available for patient teaching is "Four in a Crowd," a film produced through the Nova Foundation for World Health Year, 1971. This film focuses on the diabetic management of four people: a secretary, a child, a teenager, and an elderly male labourer. It has the distinct advantage that almost all viewers can identify with one of these characters, thus helping to overcome their feelings of hardship and/or isolation.

Programmed learning.--A teaching aid which has received much publicity in the last several years is programmed learning. Although there are many ways of programming information, one which has been tested for its diabetes educational value utilizes a teaching machine (the Auto Tutor Mark II).⁵⁸ The effectiveness of this programme was tested in 1962 under the auspices of the Diabetes and Arthritis Program, Division of Chronic Disease, United States Public Health Service. A random sample of 184 patients from four diabetic clinics in Boston, Massachusetts worked through the programme. McDonald and Kaufman reported that this preliminary study:

⁵⁸ Taking Care of Diabetes (Skokie, Illinois: The Welch Scientific Company, n.d.)

revealed that the machine was effective in teaching patients, was generally well received by subjects of all ages and levels of intellectual ability, and on the average required two hours for completion of testing.⁵⁹

Several authors reported the same study in other journals, and added their praise of the programme.^{60, 61, 62} Closer examination of the study however reveals some distinct weaknesses:

1. The median education of the subjects was grade 10, which can hardly be considered representative of the diabetic population at large;
2. Forty per cent of the subjects did not complete the course. The reason for lack of completion was not given.
3. Of those subjects who did complete the course, a significant number complained that they had difficulty with one or more of:
 - (a) the instructions; (b) the size of print;
 - (c) the illumination; (d) the language of the text;
 - (e) extreme eye fatigue; (f) minor tiredness.⁶³

⁵⁹ Glen W. McDonald and Mildred B. Kaufman, "Teaching Machines for Patients with Diabetes," Journal of the American Dietetic Association, XLII (March 1963), 211.

⁶⁰ Allan D. Spiegel, "Teaching Diabetic Patients through Automation," Hospital Topics, XLII (August 1964), 54-60.

⁶¹ Anna W. Skiff, "Programmed Instruction and Patient Teaching," American Journal of Public Health, LV, No. 3 (March 1965), 409-415.

⁶² Allan D. Spiegel, "Programmed Instruction Materials for Patient Education," Journal of Medical Education, XLII (October 1967), 958-962.

⁶³ Ibid.

Thus it seems that this aid has distinct limitations as well. Another type of programmed learning is exemplified by Learning About Diabetes, a diabetic management course put out in booklet form by the American Diabetes Association. During its development, this programme was field tested with several groups of diabetic patients across the United States.⁶⁴ This may account for the fact that it appears to have at least the following advantages over the Auto Tutor programme: simpler language and instructions, extensive illustration, lower cost.

Thus one can see that although a multitude of diabetic teaching aids is available, many of them do not meet the learning needs of the target population.

What are the nature and success of current diabetic teaching programmes?

The final questions to consider in determining 'how' the diabetic patient should be taught are, 'What is currently being done?' and 'How successful is it?' Types of diabetic programmes may be roughly divided into six categories: day care centres, clinics, institutes, home-care programmes, classes within general hospitals, and 'unplanned teaching.'

Diabetic day care centres.--These centres are a relatively new development in diabetic programmes and offer possibly the most promise for comprehensive instruction and follow-through, particularly in urban centres. Ames Company has compiled a

⁶⁴ Learning about Diabetes (New York: American Diabetes Association, 1969), acknowledgments.

sixty-one page publication to assist interested persons in establishing and operating diabetic day care centres.⁶⁵

Included in this booklet is a description of such centres: what they are, what services they provide, and what activities occur there.⁶⁶ Ehrenfeld⁶⁷ and Etzwiler⁶⁸ have reported on two American programmes which might be classified as diabetic day care centres. But, unfortunately, no longitudinal studies have yet been published which might indicate objectively the success of these centres compared to other teaching programmes.

Diabetic clinics.--Closely related to diabetic day care centres are diabetic clinics. 'Clinic' is a rather broad term, which has been applied to a wide spectrum of teaching facilities. One of the most outstanding diabetic clinics is the one at Boston's New England Deaconess Hospital.⁶⁹ Up to forty ambulatory diabetics can be accommodated at a time, the average length of stay varying from three to seven days. Formal classes are given by a doctor in the morning, and by

⁶⁵ Diabetic Day Care Centres.

⁶⁶ Some of this material has been reproduced in Appendix A of this study.

⁶⁷ Irving Ehrenfeld and Joseph A. Mattson, "A Hospital Sponsored Diabetic Instruction Program," Hospitals, XXXIX (March 1, 1965), 67-68.

⁶⁸ Donnell D. Etzwiler, "Developing a Regional Program to Help Patients with Diabetes," Journal of the American Dietetic Association, LII (May 1968), 394-400.

⁶⁹ Marguerite M. Martin, "A Teaching Centre for Diabetics," American Journal of Nursing, LVIII, No. 3 (March 1958), 390-391.

the teaching nurse in the afternoon. Provision is also made for small group and individual teaching where applicable.

Not all diabetic clinics are as sophisticated as this one. A second type of clinic is the one which operates much like a private practice, utilizing the services of physician, nurse and dietitian to follow a group of patients over time.^{70, 71} A third type of clinic is one which offers classes on a regular basis to out-patients and their families and friends.⁷² And finally, it is necessary to acknowledge the out-patient clinics of general hospitals which serve diabetics on the basis of meeting problems as they arise.

Institutes.--Recognition of the need for education of patients with diabetes led to the presentation of a "community diabetic diet institute" at the United States Public Health Service Hospital on Staten Island, New York, in 1969. The programme was in three parts, lasting a total of two hours, and comprising physician's and dietitian's talks, meal planning discussions in small groups, and a refreshment period. Such institutes⁷³ show the feasibility of hospital-community partnerships in health education programmes.

⁷⁰ Diabetic Clinic conducted by Dr. J. Birkbeck and associates at Children's Hospital, Vancouver, B. C.

⁷¹ Diabetic Clinic conducted by Dr. J. Hunt and associates at Lions' Gate Hospital, North Vancouver, B. C.

⁷² Diabetic Clinic conducted at St. Paul's Hospital, Vancouver, B. C.

⁷³ Kenneth N. Alston, "Hospital and Community Join in Diabetic Education," Hospital Topics, XLVII (September 1969), 38-40.

Home care programmes.--What of those patients who cannot or will not attend agency-sponsored centres, clinics or institutes? Gould and Golden described, as early as 1957, a teaching team of student nurse, instructor and dietitian in Albany County, Wyoming, which:

makes sure that the patient with diabetes and his family know what care he will need at home, what precautions he must observe and what general health measures should be followed.⁷⁴

Similar services are provided by many public health nursing agencies.⁷⁵

Classes.--The fifth type of diabetic programme is one in which organized classes are conducted in a general hospital setting. In 1961 Bowen, Rich and Schlotfeldt conducted a noteworthy experimental study⁷⁶ to determine whether improvement in patient well-being could be demonstrated in a group of diabetic patients who participated in a planned programme of organized instruction by registered professional nurses. Two comparable groups of patients received initial assessment of:

1. their knowledge of diabetes;

⁷⁴ Gertrude Gould and Jean Golden, "Teaching the Diabetic Patient at Home," American Journal of Nursing, LVII, No. 9 (September 1957), 1170-1171.

⁷⁵ Mildred Kaufman, "Newer Programs for Patients with Diabetes," Journal of the American Dietetic Association, XLIV (April 1964), 277-279.

⁷⁶ Rhoda G. Bowen et al., "Effects of Organized Instruction for Patients with the Diagnosis of Diabetes Mellitus," Nursing Research, X (September 1961), 151-157.

2. their skill in administering insulin;
3. their use of Clinitest equipment;
4. their attitudes toward diabetes; and
5. clinical indices of their well-being.

After this, the experimental group was exposed to five instructional sessions, one hour and 15 minutes each in length. Finally, both groups were reassessed on the same five indices as initially. The findings indicated that patients in the experimental group demonstrated significantly greater knowledge about their disease and skill in carrying out required procedures. No significant differences were found in the two groups with respect to either attitudes toward diabetes or clinical manifestations of well-being.

Advocates of classes for diabetic instruction point out that "in addition to practicality . . . group sessions have the advantage of group interaction and communication among persons with the same condition."⁷⁷ One wonders, however, whether other variables--such as the size of the class, the interest and expertise of the health professionals doing the teaching, and the fact that a patient may miss one in the series of classes due to some other hospital procedure--may not be significant in judging the relative merits of class-type instruction.

⁷⁷ Donna Nickerson, "Teaching the Hospitalized Diabetic," American Journal of Nursing, LXXII, No. 5 (May 1972), 938.

Unplanned instruction. --Whatever weaknesses and/or limitations the first five categories of diabetic programmes may present, they are nevertheless far superior to the unplanned teaching which still occurs in the majority of hospital settings. The following is a very graphic description of one such programme.

Unfortunately, I could not get one of the "kits" to send to you - so I did the next best thing and wrote down all the contents and pamphlets handed out to the new diabetic.⁷⁸

. . . By the way, I said 'new' diabetics because so far as I can tell no health teaching follow-up is given to 'old' diabetics admitted to the general wards - unless of course they are admitted specifically for problems re their diabetes. As far as any organized time table for teaching the new diabetic - there is none! It figures doesn't it?!!! There's the old syringe and orange bit and then the supervised self-injection of course - but most other aspects like skin care, cutting nails, respiratory infection, etc. etc., are more or less left to chance. There is no organized or even suggested pattern of introducing these to the patient - or I might add, of ensuring that they are even mentioned before discharge.⁷⁹

Summary

In summary, the pertinent questions regarding diabetes education may be answered as follows:

WHY? - because the day-to-day nature of diabetes management requires that the patient learn how to assume primary responsibility for his care at home.

⁷⁸ Similar to list of pamphlets given in Appendix A of this study.

⁷⁹ Excerpt from letter written to the author, in response to a request for a description of the diabetic teaching programme of a hospital.

- WHAT? - the knowledge, skills and attitudes which he needs to care for himself adequately.
- WHEN? - whenever needs, problems and/or questions arise.
Diabetes patient education is a continuous process.
- WHERE? - wherever there are diabetic patients who could benefit from instruction.
- WHO? - ideally, a teaching team of physician, nurse and dietitian. However, each of these professionals must be prepared to carry the full weight if the others are unavailable.
- HOW? - "Programs . . . that appear to have the greatest value to the person with diabetes [are those which] provide practical and continuing education, guidance and support."⁸⁰

⁸⁰ Kaufman, "Programs for Diabetes," 277.

CHAPTER III

METHODOLOGY

Introduction

This study was primarily concerned with the unplanned type of diabetic patient education described at the end of Chapter II. In an attempt to improve this situation, the author designed a "Diabetic Teaching Tool" which could be utilized by any graduate nurse to guide and facilitate the learning of her diabetic patients. The general objective of the tool was to facilitate change from unplanned instruction to planned instruction in a setting where classes, clinics or day care centres for diabetics were not operating. 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. While the author recognized that many other variables interact to determine the effectiveness of a given teaching programme, it was beyond the scope of this study to control for them. It was hoped that the results of this study might indicate the utility of such a tool for institutions and rural communities where more highly organized diabetic programmes do not exist.

The Tools

Three tools were employed in this study, two of which were based on the materials presented in Appendix B.

The first tool was a profile sheet designed to elicit pertinent demographic and diabetic characteristics of each patient.¹

The second tool was a test of diabetic learning. This test included a number of short-answer questions and a three-part performance test, designed to evaluate the learning outcomes of the instruction given to the patients. Both the test and the profile sheet were pre-tested by administering them to patients attending a local diabetic clinic. On the first pre-test (involving five patients) some ambiguities in directions, wording and scoring became apparent. In addition, it seemed wise to separate the knowledge tests for insulin and anti-diabetic pill users. These changes were made, and the revised forms² pre-tested on five other patients, with satisfactory results.

The third tool used in this study was the "Diabetic Teaching Tool" itself. The basic components of this tool were twofold. The first component was an easel binder, sized for use on an over-bed table. The materials in the binder--posters and nurses' instructions--were designed to deal with the eleven

¹ A copy of the Patient Profile Sheet may be found in Appendix C.

² A copy of the Test of Diabetic Learning may be found in Appendix C.

major content areas of diabetic learning, that is: diet; urine testing; action of insulin and other hypoglycemic agents; technique and sites for insulin injection; care of equipment; symptoms of hypoglycemia; symptoms of uncontrolled diabetes; care of the feet; what to do in case of acute complications; when to consult health professionals; and how to balance exercise and activity with insulin. The second component of the tool was a carrying case containing kardex slips, diabetic supplies lists, consent forms, meal planning booklets, urine testing kits, patient take home folders, and a supply of 8½" x 11" pages with content corresponding to that presented in the easel binder. Prescription-type format was utilized on several of these pages to allow individualization of the information to the patients' interests, needs and level of clinical control.³

Every attempt was made to gear the "Diabetic Teaching Tool" to the learning needs of the average diabetic patient. The Dale-Chall readability formula⁴ was used, in conjunction with Thrush and Lanese's list of unfamiliar words relating to diabetes,⁵ in an attempt to keep the reading level of the material at or about grade six. Abundant use was made of illustrations and diagrams.

³ A copy of the Diabetic Teaching Tool may be found in Appendix D.

⁴ Edgar D. Dale and Jeanne S. Chall, "A Formula for Predicting Readability," Education Research Bulletin, XXVII (1948), 11-28.

⁵ Rudolph S. Thrush and Richard R. Lanese, "The Use of Printed Material in Diabetes Education," Diabetes, XI, No. 2 (March-April 1962), 132.

A printed sheet of instructions⁶ accompanied the tool, to guide nurses in their use of it.

Validity of the "Diabetic Teaching Tool" was established by subjecting it to a critical review and revision by a panel of experts.⁷

The Population and the Setting

This study was carried out on diabetic patients admitted to the following five wards of a suburban general hospital over a six month period: an activation ward, two medical wards, the medical section of a medical-surgical ward, the ante-partum section of an obstetrics and gynecology ward.

Each patient was selected for the study according to the following criteria:

1. has a primary or secondary diagnosis of diabetes mellitus;
2. falls into one of the following classes of admitting diagnosis:
 - (a) newly diagnosed diabetic,
 - (b) diabetes out of control,
 - (c) complication(s) of diabetes,
 - (d) ante-partum,
 - (e) unrelated medical condition;

⁶ The instructions for use of the Diabetic Teaching Tool are included with the tool in Appendix D.

⁷ The panel of experts for this study was made up of the author's consultation committee plus seven individuals having special interest and/or expertise in the field of diabetes: two diabetic patients, two physicians, a dietitian, and two nurses.

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. is free of mental or emotional handicaps;
8. consents to participate; and
9. lives within a 50-mile radius of Vancouver city.

Those patients admitted to the institution during the first three months of the study were assigned to the control group; those in the last three months to the experimental group.

The Procedure

The study was conducted in six stages. The first stage was the development of the test of diabetic learning. This stage was accomplished by following the series of steps suggested by Grondlund⁸ for the planning of tests, that is

1. Identify the learning outcomes to be measured by the test.
2. Define the learning outcomes in terms of specific, observable behavior.⁹
3. Outline the subject-matter content to be measured by the test.¹⁰

⁸ Norman E. Grondlund, Constructing Achievement Tests (Englewood Cliffs, New Jersey: Prentice Hall Inc., 1968), p. 13.

⁹ The learning outcomes are given in Appendix B under the heading "Objectives for a Basic Course in Diabetic Self-Management."

¹⁰ The subject-matter content is given in Appendix B under the heading "Content of a Basic Course in Diabetic Self-Management."

4. Prepare a table of specifications.¹¹
5. Use the table of specifications for preparing the test.

When the test was drawn up it was pretested, revised, and pretested again before it was considered acceptable for use in this study.

The second stage in the study involved administering the test of diabetic learning to a control group of patients. All diabetic patients discharged from the participating institution during the first three months of the data collection period were designated as potential control patients. The nursing staff were not informed that these patients were to be tested; thus no out-of-the-ordinary effort was made regarding their diabetic teaching. From this group, each patient who met the criteria set out for the population in this study was contacted by telephone shortly after his discharge. In order to secure his consent to participate, both the purpose of the study and the requirements of participants were carefully explained. If verbal consent was obtained, arrangements were made for the researcher to visit the subject at his home for the purpose of administering the test. During this visit a written consent was also obtained, and a patient profile completed. A total of twenty subjects constituted the control group.

¹¹ The table of specifications is given in Appendix B under the heading "Specifications for the Test of Diabetic Learning."

The third stage in the study was the development of the "Diabetic Teaching Tool." The major guide utilized in the development of this tool was the course outline--content and objectives--described in Appendix B of this study. In addition, many ideas and suggestions cited in the resume of present knowledge (Chapter II) were utilized. A commercial art student was employed to design the posters. Ongoing consultation with the researcher's thesis committee and selected members of the panel of experts facilitated this task. When the tool was near completion, it was presented to the entire panel of experts for critical review. Several minor changes were suggested during these sessions, most of which were incorporated into the final product.

The fourth stage in the study was the utilization of the "Diabetic Teaching Tool" in instructing an experimental group of patients. Immediately prior to the initiation of this stage, an inservice programme was undertaken in order to familiarize the nursing staff with the tool and to ensure consistent use of it. Each patient in the experimental group was approached shortly after his admission to determine his willingness to participate in the study. If agreement was obtained, a consent form was signed, and arrangements subsequently made to initiate his teaching. Each patient in the experimental group was thus taught by his own nurse(s), using the "Diabetic Teaching Tool," between the time of his admission and his discharge from the institution.

The fifth stage in the study involved administering the test of diabetic learning to the experimental group of patients. Those patients who had been taught and who also met the criteria for this study were contacted by telephone shortly after discharge. Home interviews were then arranged, during which the patient profiles were completed and the tests of diabetic learning administered. This stage and the preceding one were continued until twenty experimental subjects were obtained for the study. At this time the data collection was terminated and the "Diabetic Teaching Tool" withdrawn from the participating institution.

The sixth and final stage in the study was the analysis of the data. The raw data obtained from the patients' profile sheets and test results were compiled and tabulated. Demographic and diabetic characteristics of the subjects were analyzed and described in terms of distributions, medians and/or means. Test results were subjected to t-test analyses on several dimensions. And a number of demographic and diabetic traits were compared with their respective test scores by means of the Pearson-Product Moment Correlation Coefficient. A level of .05 was accepted as statistically significant throughout.

CHAPTER IV

FINDINGS

Introduction

The findings of this study are presented in three sections. The first section--based on data obtained from the patient profile sheets--is devoted to a comparison of the demographic and diabetic characteristics of the control and experimental patient groups. The second section contains analyses of the scores which subjects achieved on the test of diabetic learning, and relates these results to the hypothesis of the study. The third section presents an examination and discussion of the correlations between selected demographic or diabetic characteristics and respective test scores.

Demographic and Diabetic Characteristics of the Population

Demographic and diabetic data were recorded for each patient in relation to the following items: age, sex, marital status, occupation, education, reason for current hospital admission, time elapsed since most recent previous hospital admission, age at onset of diabetes, duration of diabetes, type of clinical control, and most helpful source of diabetic information.

Age

Table I gives the comparative distribution of the subjects by age. The median age in the control group was fifty-four years, while that in the experimental group was fifty years. Thus the control patients were slightly older than were the experimental patients.

Sex

Table II shows the comparative distribution of the subjects by sex. In both the control and experimental groups there was a larger proportion of females than males (seventy-five per cent females in the control group and sixty per cent females in the experimental group).

Marital Status

Marital status of the study subjects is indicated in Table III. The majority of patients in both groups were married (seventy per cent in the control group and eighty-five per cent in the experimental group).

Occupation

The control and experimental groups were quite similar with respect to occupation. Four out of five males in the control group and five out of eight in the experimental group were retired. Similarly, eleven out of fifteen females in the control group and eight out of twelve in the experimental group were housewives. The remaining occupations covered a wide range.

TABLE I
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY AGE

Age (Years)	Control Patients	Experimental Patients
15-24	0	1
25-34	2	1
35-44	2	5
45-54	6	6
55-64	1	3
65-74	2	2
75-84	5	2
85 and over	2	0
Total	20	20

TABLE II
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY SEX

Sex	Control Patients	Experimental Patients
Male	5	8
Female	15	12
Total	20	20

TABLE III
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY MARITAL STATUS

Marital Status	Control Patients	Experimental Patients
Single	--	1
Married	14	17
Widowed	4	2
Divorced/Separated	2	--
Total	20	20

Education

In education the two study groups were also very similar, as is illustrated in Table IV. The median education in the control group was nine and one half years, in the experimental group ten years. Moreover, the proportions of subjects having elementary, secondary and post-secondary education respectively were very close for the two groups.

Reason for current hospital admission

Table V shows the comparative distribution of reasons for current hospital admission of all subjects in the study. It should be noted that although there was a larger proportion of new diabetics in the experimental group than in the control group, the numbers of admissions directly related to diabetes were very similar in both groups, that is, ten and twelve.

Most recent previous hospital admission

As Table VI indicates, the data related to the most recent previous hospital admissions of subjects were highly similar for the two study groups. Six control and five experimental patients had had their most recent previous admission within one year of the test date; nine control and twelve experimental patients had last been hospitalized one to ten years prior to the test date, and five control and three experimental patients had not been in hospital for over ten years. Moreover, eight out of twenty subjects (forty per cent) in each group were not diabetic at the time of their most recent previous admission; twelve out of twenty (sixty per cent) were diabetic at that time.

TABLE IV
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY EDUCATION

Schooling Completed	Control Patients	Experimental Patients
0-4 years	3	--
5-8 years	4	8
(public school) ^a	(7) ^a	(8) ^a
9-10 years	4	4
11-13 years	5	6
(high school) ^a	(9) ^a	(10) ^a
post-secondary	4	2
Total	20	20

^a These are sub-totals.

TABLE V
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY REASON FOR CURRENT
ADMISSION TO HOSPITAL

Reason for Current Admission to Hospital	Control Patients	Experimental Patients
New diabetic	2	7
Regulation of diabetes	5	2
Complication of diabetes	3	3
Unrelated condition	10	8
Total	20	20

TABLE VI
COMPARISON OF CONTROL AND EXPERIMENTAL PATIENTS
BY MOST RECENT PREVIOUS HOSPITAL ADMISSION

Time of Most Recent Previous Hospital Admission	Control Patients		Experimental Patients	
	# Diabetic at the time	# not Diabetic at the time	# Diabetic at the time	# not Diabetic at the time
6 weeks ago or less	2	--	--	--
over 6 wk.-under 1 yr.	4	--	4	1
1-5 years ago	5	3	7	4
6-10 years ago	--	1	1	--
over 10 years ago	1	4	--	3
Total	12	8	12	8

Age at onset of diabetes

Table VII shows the comparative distribution of control and experimental patients by age at onset of their diabetes. For both groups the median age at onset was in the forty-five to fifty-four year range, the control being slightly higher than the experimental.

Duration of diabetes

Table VIII gives the comparative distribution of the subjects by duration of their diabetes. The distributions were again quite similar, with the median duration for the control group being eight years and that for the experimental group five and one half years.

Type of clinical control

Table IX indicates the numbers of subjects whose diabetes was controlled by antidiabetic pills, less than thirty units of insulin and thirty or more units of insulin respectively. There were ten pill-users and ten insulin-users in each group of the study. In the control group six out of the ten insulin-users were taking thirty or more units of insulin daily; in the experimental group five out of the ten insulin-users fell into this classification.

Sources of information on diabetes management

The data related to sources of information for diabetic self-management proved difficult to tabulate for two reasons. First, subjects often stated that only a small number of the ten resources suggested had served them in any way; thus they

TABLE VII
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY AGE AT ONSET OF DIABETES

Age at Onset of Diabetes (Years)	Control Patients	Experimental Patients
0-14	2	1
15-24	--	2
25-34	1	5
35-44	4	1
45-54	4	5
55-64	2	3
65-74	6	3
75 and over	1	--
Total	20	20

TABLE VIII
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY DURATION OF DIABETES

Duration of Diabetes	Control Patients	Experimental Patients
0-6 days	--	--
1-5 weeks	1	3
6 wk.-11 mos.	3	5
1-5 years	5	2
6-10 years	2	2
over 10 years	9	8
Total	20	20

TABLE IX
COMPARISON OF CONTROL AND EXPERIMENTAL PATIENTS
BY TYPE OF DIABETIC CONTROL

Type of Diabetic Control	Control Patients	Experimental Patients
Diet and antidiabetic pill	10	10
Diet and less than 30 u insulin	4	5
Diet and 30 u or more insulin	6	5
Total	20	20

were unable to complete the assigned task of ranking all ten. And second, subjects frequently were unable to decide which of two given resources was the more helpful; thus they would assign both the same rank. For these reasons, the data for this section reflect only the frequency with which resources were reported as useful, and not their rank. In the control group those sources of information most frequently mentioned as being helpful were doctors, pamphlets, friends or relatives and dietitians; in the experimental group they were nurses, the "Diabetic Teaching Tool," doctors and dietitians. Nurses were seen as useful learning resources by only three (fifteen per cent) of the control patients. In the experimental group, by contrast, nurses were cited as helpful by sixteen (eighty per cent) of the subjects. This finding would seem to indicate that the "Diabetic Teaching Tool"--by virtue of the directed interaction it specified between patient and nurse--helped to increase the nurse's usefulness to the patient as a resource for learning about home management.

In summary, one may say that there was a high degree of similarity between control and experimental patients in the study with respect to both demographic and diabetic characteristics.

Scores Achieved on the Test of
Diabetic Learning

Scores achieved by subjects on the test of diabetic learning were subjected to t-test analysis on several dimensions. First, scores achieved on the knowledge section of the test were examined. Tables X and XI provide a comparison of control and experimental scores for antidiabetic pill-users and insulin-users respectively. In both sub-groups, the experimental patients scored better on the average than did the control patients. The difference between the scores was statistically significant (at the .005 level) for the pill-users; it was not statistically significant for the insulin-users. Two factors may have influenced the latter result. In the first place, there was a much wider distribution of scores among the control insulin-users than among their experimental counterparts. Added to this is the fact that one control subject was a registered nurse; this subject scored higher on the knowledge test than did any other subject in the entire study.

Next, scores of all subjects on the diet planning skill sub-test were compared. Table XII shows the marked difference between the control and experimental patients on this item, a difference which is statistically significant at all known levels.

Then scores of all subjects on the urine testing skill sub-test were reviewed. Here again, a statistically significant difference between control and experimental subjects was evidenced. These data are presented on Table XIII.

TABLE X
COMPARISON OF CONTROL AND EXPERIMENTAL
PILL-USERS BY SCORE ON
KNOWLEDGE TEST

Scores of Control Patients (70 max.)	Scores of Experimental Patients (70 max.)
13.5	40.0
15.5	44.0
18.5	47.0
19.5	51.5
21.0	52.5
38.0	53.0
42.5	54.0
43.5	56.5
44.0	60.5
57.0	62.5
$\bar{C} = 31.30$	$\bar{E} = 52.15$

$t = 3.911$ (significant at the .005 level)

TABLE XI
COMPARISON OF CONTROL AND EXPERIMENTAL
INSULIN-USERS BY SCORE ON
KNOWLEDGE TEST

Scores of Control Patients (75 max.)	Scores of Experimental Patients (75 max.)
30.0	44.0
33.5	48.5
44.0	54.0
46.0	56.5
53.5	57.0
57.5	57.5
58.0	61.0
62.5	62.5
63.0	64.0
69.5	64.5
$\bar{C} = 51.75$	$\bar{E} = 56.95$

$t = 1.121$ (not significant)

TABLE XII
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY SCORE ON DIET PLANNING
SKILL TEST

Scores (20 max.)		Scores (20 max.)	
Control Patients	Experimental Patients	Control Patients	Experimental Patients
3.0	13.5	11.0	17.0
4.0	14.0	11.5	17.0
5.0	14.5	12.0	17.0
5.5	14.5	12.5	17.5
6.0	15.0	13.0	18.0
7.0	15.5	14.0	18.0
8.5	15.5	15.5	18.0
8.5	16.0	16.0	18.0
9.0	16.0	16.0	18.5
9.0	16.0		
10.0	16.5	$\bar{C} = 9.85 \quad \bar{E} = 16.30$	

$t = 6.782$ (significant at all known levels)

TABLE XIII
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY SCORE ON URINE TESTING
SKILL TEST

Scores (10 max.)		Scores (10 max.)	
Control Patients	Experimental Patients	Control Patients	Experimental Patients
0.0	3.5	5.0	7.0
0.0	4.0	5.5	7.0
2.0	4.5	5.5	7.0
2.0	5.0	6.0	8.0
2.0	5.5	6.0	8.5
3.0	5.5	7.0	8.5
4.0	6.0	7.0	9.0
4.0	6.0	8.0	9.0
4.0	7.0	8.0	10.0
4.0	7.0		
5.0	7.0	$\bar{C} = 4.40$	$\bar{E} = 6.75$

$t = 3.560$ (significant at all known levels)

Scores achieved by insulin-users on the insulin procedures skill sub-test were also studied. Since a clear majority of patients in the study (eighty per cent of the control group, and sixty per cent of the experimental group) used disposable needles and syringes, the data pertaining to care of equipment was not sufficient to permit statistical analysis. Table XIV gives a comparison of control and experimental scores on the injecting section of the sub-test. Experimental subjects performed this skill significantly better than did control subjects.

After scores on the various sub-tests had been analysed, a number of combined scores were examined. The first of these data analyses was a comparison of control and experimental patients' combined scores showing both knowledge and skill in relation to diet. On the knowledge test, a total of sixteen points regarding diet could be attained. This together with the twenty points for the diet planning skill test made a total possible score of thirty-six points related to learning about diet. The results of this correlation are tabulated in Table XV. The analysis showed a highly significant difference between the scores of control and experimental subjects, a difference which indicates that the experimental subjects were better able to understand and use their diabetic diets than were their counterparts in the control group.

A similar analysis was done on the combined scores indicating knowledge and skill related to urine testing. In this case the total possible combined score was twenty points, ten

TABLE XIV
COMPARISON OF CONTROL AND EXPERIMENTAL
INSULIN-USERS BY SCORE ON
INSULIN INJECTING SKILL TEST

Scores of Control Patients (11 max.)	Scores of Experimental Patients (11 max.)
3.5	8.0
6.0	9.0
7.0	9.0
7.5	9.0
7.5	9.0
7.5	9.5
8.0	10.0
8.0	10.0
8.0	10.5
9.0	11.0
$\bar{C} = 7.20$	$\bar{E} = 9.50$

$t = 2.853$ (significant at the .01 level)

TABLE XV
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY SCORE ON KNOWLEDGE AND SKILL
TESTS REGARDING DIET

Score (36 max.)		Score (36 max.)	
Control Patients	Experimental Patients	Control Patients	Experimental Patients
6.0	21.0	22.5	29.0
9.0	23.0	23.0	29.0
9.5	24.5	23.5	30.0
10.0	26.0	24.5	31.0
10.5	27.0	26.0	31.5
11.0	27.0	28.0	32.0
12.0	27.0	28.5	32.5
12.5	27.5	30.0	33.0
16.0	27.5	30.0	34.0
19.5	28.0		
21.0	28.0	$\bar{C} = 18.65 \quad \bar{E} = 28.42$	

$t = 5.033$ (significant at all known levels)

for knowledge and ten for skill. Table XVI shows that the experimental group scored significantly higher than did the control group on all aspects of urine testing.

The next analysis was of the same type as the preceding two, combining the scores of insulin-users showing knowledge and skill relating to their medication. The ten points for knowledge about medication and the eleven points for skill in the insulin injection procedure were summed to make a total possible score of twenty-one points. As Table XVII indicates, the experimental patients demonstrated significantly better knowledge and skill regarding their medication than did the control patients.

The final three data analyses performed on the test scores concerned the total percentage scores achieved by subjects on all aspects of the testing. To achieve these scores, each patient's sub-scores on the knowledge and three skill tests were summed, and a percentage score calculated. Table XVIII presents a comparison of control and experimental pill-users by their total percentage scores. A highly significant difference emerged between these two groups, thus indicating that diabetic pill-users taught by means of the "Diabetic Teaching Tool" demonstrated a higher level of learning about their diabetic management than did those taught in the institution's usual manner.

Table XIX gives a similar comparison of the scores of insulin-users. Here again, the experimental subjects achieved significantly better total percentage scores than did their

TABLE XVI
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY SCORE ON KNOWLEDGE AND SKILL
TESTS REGARDING URINE TESTING

Score (20 max.)		Score (20 max.)	
Control Patients	Experimental Patients	Control Patients	Experimental Patients
2.0	9.5	12.0	16.0
2.0	10.0	14.0	16.0
4.0	11.0	14.5	17.0
5.0	12.0	15.0	17.0
7.0	13.5	15.0	17.0
10.0	14.0	16.0	17.5
11.0	14.0	17.0	18.0
11.0	14.5	18.0	20.0
11.0	15.0		
12.0	15.0	$\bar{C} = 10.95 \quad \bar{E} = 14.9$	

$t = 3.110$ (significant at the .005 level)

TABLE XVII
COMPARISON OF CONTROL AND EXPERIMENTAL
INSULIN-USERS BY SCORE ON INSULIN
KNOWLEDGE AND SKILL TESTS

Scores of Control Patients (21 max.)	Scores of Experimental Patients (21 max.)
10.0	15.0
12.0	16.0
13.0	16.5
13.0	17.0
14.5	17.0
14.5	18.0
14.5	18.5
15.0	18.5
16.5	19.0
18.5	20.5
$\bar{C} = 14.15$	$\bar{E} = 17.60$

$t = 3.820$ (significant at the .005 level)

TABLE XVIII
COMPARISON OF CONTROL AND EXPERIMENTAL
PILL-USERS BY TOTAL PERCENTAGE SCORE
ON TEST OF DIABETIC LEARNING

Percentage Score of Control Patients	Percentage Score of Experimental Patients
20.5	57.5
23.5	64.5
24.0	65.5
31.5	71.0
32.0	76.5
50.5	77.0
59.0	79.5
59.5	80.0
62.0	84.5
71.5	84.5
$\bar{C} = 43.40$	$\bar{E} = 74.05$

$t = 4.592$ (significant at all known levels)

TABLE XIX
COMPARISON OF CONTROL AND EXPERIMENTAL
INSULIN-USERS BY TOTAL PERCENTAGE
SCORE ON TEST OF DIABETIC LEARNING

Percentage Score of Control Patients	Percentage Score of Experimental Patients
37.2	65.4
38.8	66.8
54.3	72.4
58.2	76.7
72.4	78.4
72.8	79.6
73.7	82.1
73.7	84.1
80.2	86.2
86.6	87.1
$\bar{C} = 64.79$	$\bar{E} = 77.88$

$t = 2.227$ (significant at the .025 level)

control counterparts. It is worth noting at this point that while the difference between the knowledge scores of the two groups of insulin-users was not statistically significant, the difference between the total percentage scores was statistically significant. Therefore, learning at the application level--demonstrated by performance on the skill tests--must have been considerable, especially when one considers that skills contribute less (forty-one to fifty points) to the total score than does knowledge (seventy-five points). These results show that diabetic insulin-users taught by means of the "Diabetic Teaching Tool" demonstrated a higher level of learning about their diabetic management than did those taught in the institution's usual manner.

The final t-test analysis of the data was performed on the total percentage test scores of all control and experimental subjects. Accordingly, Table XX presents a comparison of these scores. Once again a highly significant difference was found between the scores of the two groups. On the basis of this and the preceding analyses the null hypothesis--"there is no significant difference in the learning of patients in the experimental group as compared with patients in the control group"--was rejected.

TABLE XX
COMPARISON OF CONTROL AND EXPERIMENTAL
PATIENTS BY TOTAL PERCENTAGE SCORE
ON TEST OF DIABETIC LEARNING

Percentage Score		Percentage Score	
Control Patients	Experimental Patients	Control Patients	Experimental Patients
20.5	57.5	59.5	79.5
23.5	64.5	62.0	79.6
24.0	65.4	71.5	80.0
31.5	65.5	72.4	82.1
32.0	66.8	72.8	84.1
37.2	71.0	73.7	84.5
38.8	72.4	73.7	84.5
50.5	76.5	80.2	86.2
54.3	76.7	86.6	87.1
58.2	77.0		
59.0	78.4	$\bar{C} = 54.10$	$\bar{E} = 75.97$

$t = 4.381$ (significant at all known levels)

Correlations Between Selected Demographic
and Diabetic Characteristics of Subjects
and Their Respective Test Scores

Five demographic and/or diabetic characteristics of the study subjects--age at testing, education, reason for current admission, age at onset of diabetes and duration of diabetes--were selected for this section of the data analysis on the basis that there might be a relationship between one or more of these factors and the scores which subjects achieved on the test of diabetic learning.

Table XXI shows the relationship between the subjects' age at testing and their total test scores. Age at testing proved to be a highly significant factor influencing test scores in the control group (the older the patient, the lower his test score); it was not statistically significant in the experimental group. Two possible reasons are suggested for this finding. In the first place, there was a larger proportion of subjects over seventy-five years of age in the control group. This might have accounted for some difference in the correlation coefficients, although it is questionable that the entire difference could be attributed to this fact. In the second place, it is possible that nurses (as many other people¹) have a negative mind-set toward the learning capacities of adults. If that were the case, they would believe

¹ Adult Education: Theory and Method. Psychology of the Adult, (Washington: Adult Education Association of the U.S.A., 1962), p. 5.

TABLE XXI
THE RELATIONSHIP BETWEEN AGE AT TESTING
AND TOTAL PERCENTAGE SCORE

Control Patients		Experimental Patients	
Age	Score	Age	Score
--	--	1 (15-24 years)	79.6
2 (25-34 years)	72.4	2 (25-34 years)	78.4
2	86.6	--	--
3 (35-44 years)	72.8	3 (35-44 years)	57.5
3	73.7	3	76.7
--	--	3	82.1
--	--	3	84.5
--	--	3	86.2
4 (45-54 years)	54.3	4 (45-54 years)	71.0
4	58.2	4	76.5
4	71.5	4	77.0
4	73.7	4	84.1
4	80.2	4	84.5
--	--	4	87.1
5 (55-64 years)	38.8	5 (55-64 years)	64.5
5	50.5	5	66.8
--	--	5	79.5
6 (65-74 years)	23.5	6 (65-74 years)	65.5
6	62.0	6	80.0
7 (75-84 years)	20.5	7 (75-84 years)	65.4
7	31.5	7	72.4
7	32.0	--	--
7	37.2	--	--
7	59.0	--	--
8 (85 yr. or more)	24.0	--	--
8	59.5		
$r_c = -.627$ (significant at all known levels)		$r_E = -.381$ (not significant)	

that their older patients were unable to learn, and thus would not make the same effort to teach them that they would with younger patients. In the experimental phase of the study the nurses were instructed to teach all diabetic patients; thus this effect may have been overcome.

Table XXII is concerned with the relationship between the educational background of the subjects and their test scores. Here again, a highly significant relationship was found between these two factors in the control group (the higher the education the higher the score); but virtually no such relationship existed in the experimental group. Once again, two reasons are suggested. Three subjects in the control group had only three or four years of formal schooling, whereas no experimental subjects fell into this classification. All three of these control subjects had quite low test scores, which undoubtedly influenced the correlation coefficient. Another contributor might be a psychological factor similar to the one just described relating to age, that is: nurses may have a negative mind-set toward the learning capacities of individuals with limited education. Such individuals are often not well-spoken, hence there may be a tendency to assume that they have limited understanding. Diabetic teaching in such instances probably tends to be diluted or omitted. This factor could not act in the experimental phase of the study (since all diabetic patients were to be taught), thus accounting for the considerable difference in the scores of subjects with just six to eight years of schooling.

TABLE XXII
THE RELATIONSHIP BETWEEN EDUCATION
AND TOTAL PERCENTAGE SCORE

Control Patients		Experimental Patients	
Schooling (Years)	Score	Schooling (Years)	Score
3	38.8	--	--
4	24.0	--	--
4	32.0	--	--
6	23.5	6	65.4
6	58.2	--	--
--	--	7	65.5
--	--	7	80.0
8	20.5	8	76.5
8	31.5	8	79.5
8	73.7	8	79.6
--	--	8	82.1
--	--	8	87.1
9	54.3	9	76.7
9	72.8	--	--
10	72.4	10	72.4
--	--	10	84.5
--	--	10	84.5
11	50.5	11	57.5
11	59.5	11	71.0
11	71.5	--	--
12	37.2	12	77.0
12	73.7	12	78.4
--	--	12	84.1
--	--	13	64.5
14	62.0	14	66.8
14	59.0	--	--
14	80.2	--	--
15	86.6	16	86.2
$r_c = .801$ (significant at all known levels)		$r_E = .002$ (not significant)	

Table XXIII examines the relationship between subjects' scores and their reason for current admission to hospital. It was felt that patients admitted for their diabetes (that is, new diabetics, or long-standing diabetics having complications or needing regulation) might receive more teaching and thus score better on the subsequent test of diabetic learning than patients admitted for unrelated conditions. This did not prove to be the case in either the control or the experimental group.

Table XXIV shows the relationship between age at onset of diabetes and subsequent test scores. Once again the results of this correlation were markedly different in the two study groups. There was a highly significant correlation between age at onset and test score in the control group (the later the age at onset, the lower the test score), but no statistically significant relationship in the experimental group. The fact that there were four more control than experimental subjects with an age at onset over sixty-five years might account for part of this difference. A rather complex psychological factor might also have influenced the results. When younger individuals become afflicted with a chronic condition, there may be a tendency for health care personnel to identify with them and thus put forth an extra effort to assist these patients to cope with their altered life style. With older individuals, however, especially if the teaching does not progress easily, there may be a tendency to let matters slide with the rationalization that these people have 'lived good lives' and are 'too old to change anyway.' Complicating this is the etiological fact that when

TABLE XXIII
COMPARISON OF TOTAL PERCENTAGE SCORES
OF ALL PATIENTS BY REASON FOR CURRENT
ADMISSION TO HOSPITAL

Control Patients' Scores		Experimental Patients' Scores	
Diabetes-Related Admissions	Unrelated Admissions	Diabetes-Related Admissions	Unrelated Admissions
20.5	24.0	64.5	57.5
23.5	32.0	65.4	65.5
31.5	37.2	66.8	72.4
50.5	38.8	71.0	76.7
54.3	59.0	76.5	77.0
58.2	59.5	78.4	79.6
72.4	62.0	79.5	84.5
73.7	71.5	80.0	84.5
80.2	72.8	82.1	
86.6	73.7	84.1	
		86.2	
		87.1	
$\bar{C} = 55.14$	$\bar{C}^1 = 53.05$	$\bar{E} = 76.80$	$\bar{E}^1 = 74.71$
$t = .220$ (not significant)		$t = .534$ (not significant)	

TABLE XXIV
THE RELATIONSHIP BETWEEN AGE AT ONSET OF
DIABETES AND TOTAL PERCENTAGE SCORE

Control Patients		Experimental Patients	
Age at Onset	Score	Age at Onset	Score
1 (0-14 years)	72.4	1 (0-14 years)	76.7
1	72.8	--	--
--	--	2 (15-24 years)	79.6
--	--	2	82.1
3 (25-34 years)	86.6	3 (25-34 years)	57.5
--	--	3	78.4
--	--	3	84.1
--	--	3	84.5
--	--	3	86.2
4 (35-44 years)	24.0	4 (35-44 years)	76.5
4	59.5	--	--
4	73.7	--	--
4	80.2	--	--
5 (45-54 years)	54.3	5 (45-54 years)	66.8
5	58.2	5	71.0
5	71.5	5	77.0
5	73.7	5	84.5
--	--	5	87.1
6 (55-64 years)	20.5	6 (55-64 years)	64.5
6	50.5	6	72.4
--	--	6	79.5
7 (65-74 years)	23.5	7 (65-74 years)	65.4
7	31.5	7	65.5
7	32.0	7	80.0
7	37.2	--	--
7	59.0	--	--
7	62.0	--	--
8 (75 yr.or over)	38.8	--	--
$r_c = -.611$ (significant at all known levels)		$r_E = -.344$ (not significant)	

diabetes has its onset early in life it is likely to be more difficult to control. Thus the learning needs of the patient with an early onset would be more apparent, and he would receive more attention on this count as well. The effect of these influences would to some degree have been abated in the experimental group where all patients were to be taught.

Table XXV indicates the relationship between duration of diabetes and test scores. It was suggested that, on the one hand, persons with a longer duration of diabetes would have had more learning opportunities and so would score better. On the other hand, it was felt that the learning needs of long-standing diabetics might not be apparent to their nurses; thus they would receive no review or reinforcement of their learning, and would not achieve good test scores. For both the experimental and control groups the correlation coefficients for this analysis were not significant. This may indicate that duration of diabetes and test scores are simply not related, or it may indicate that both of the above suggestions are valid, but that their effects cancel one another.

In summary, statistically significant relationships were found between the total percentage test scores of control patients and the following factors: age at testing, education, and age at onset of diabetes. No such correlations characterized the experimental group.

TABLE XXV
THE RELATIONSHIP BETWEEN DURATION OF
DIABETES AND TOTAL PERCENTAGE SCORE

Control Patients		Experimental Patients	
Duration	Score	Duration	Score
1 (less than 1 year)	23.5	1 (less than 1 year)	64.5
1	38.8	1	71.0
1	50.5	1	77.0
1	62.0	1	78.4
1	73.7	1	79.5
--	--	1	80.0
--	--	1	86.2
--	--	1	87.1
2 (1-5 years)	31.5	2 (1-5 years)	65.5
2	58.2	2	79.6
2	71.5	--	--
2	73.7	--	--
2	86.6	--	--
3 (6-10 years)	32.0	3 (6-10 years)	84.5
3	54.3	3	84.5
4 (over 10 years)	20.5	4 (over 10 years)	57.5
4	24.0	4	65.4
4	37.2	4	66.8
4	59.0	4	72.4
4	59.5	4	76.5
4	72.4	4	76.7
4	72.8	4	82.1
4	80.2	4	84.1
$r_c = -.028$ (not significant)		$r_E = -.230$ (not significant)	

CHAPTER V
SUMMARY, CONCLUSIONS, IMPLICATIONS
AND RECOMMENDATIONS

The purpose of this study was to answer the question, 'Will diabetic patients taught by means of a "Diabetic Teaching Tool" demonstrate a higher level of learning about self-care than patients taught in the institution's usual manner?' The answer to the question was sought by comparing the self-care knowledge and skills of two groups of diabetic patients admitted to a suburban general hospital which, prior to the study, offered no planned programme of diabetic patient education. The twenty subjects in the control group were taught in an unplanned manner, based upon whether and/or what instructions were deemed pertinent by their nurses. A "Diabetic Teaching Tool"--designed by the researcher and administered by each patient's own nurse(s)--was used to instruct the twenty experimental subjects. After discharge, each of the forty subjects was visited by the researcher, at which time a profile sheet was completed and a test of diabetic learning administered.

Demographic and diabetic characteristics of the subjects--obtained from the patient profile sheets--were analyzed and described in terms of distributions, medians and/or means. The test results were subjected to t-test analyses on several

dimensions. And a number of demographic and diabetic traits were compared with their respective test scores by means of the Pearson Product Moment Correlation Coefficient.

Summary of the Findings

The major findings of the study are presented here in summary form.

Demographic and diabetic characteristics

The typical control patient in this study was a married female fifty-four years of age at the time of testing. She had completed nine and one half years of schooling, and was presently not working outside of her home. She was first diagnosed as having diabetes at fifty-one years of age, and had thus been diabetic for three years. She viewed the doctor, the dietitian, friends or relatives and pamphlets as her most helpful sources of information regarding diabetes management.

The typical experimental patient, on the other hand, was also a married female, but slightly younger (approximately fifty years of age at the time of testing). She had completed ten years of schooling, and was not employed outside of her home. She was forty-six years old when her diagnosis of diabetes was established, and had thus been diabetic for four years at the time of this study. She named the nurse, the "Diabetic Teaching Tool," the doctor and the dietitian as the sources of diabetic information which she found most useful in teaching her home care.

Fifty per cent of the subjects in each study group were controlled by antidiabetic pills, and fifty per cent by insulin. Reason for current hospital admission was related to the diabetic condition for half the control subjects and twelve of the twenty experimental patients.

Scores on the test of diabetic learning

Statistically significant differences were found between control and experimental subjects' scores in the following areas: (1) knowledge sub-test for antidiabetic pill-users, (2) diet planning skill sub-test for both insulin- and pill-users, (3) urine testing skill sub-test for both insulin- and pill-users, and (4) insulin injecting skill sub-test. While experimental subjects did achieve a better mean score on the knowledge sub-test for insulin-users than did their control counterparts, this finding was not statistically significant.

When the knowledge and skill scores for selected areas of diabetic management were combined, statistically significant differences were found between control and experimental subjects on each of the following items: diet planning, urine testing and medications.

Moreover, there was a statistically significant difference between the total percentage test scores achieved by the control subjects and those of the experimental subjects. On the basis of these findings, the null hypothesis--there is no significant difference in the learning of patients in the control group as compared with patients in the experimental group--was rejected.

Other dimensions

Highly significant correlations were found between the total percentage test scores of the control subjects and the following characteristics: age at testing, education, and age at onset of diabetes. However, no such correlations were found for the experimental subjects, a fact which may be attributable, at least in part, to the instructions accompanying the "Diabetic Teaching Tool." Finally, in neither of the study groups was there a statistically significant relationship between total percentage test scores and duration of diabetes or reason for current hospital admission.

Conclusions

From the findings the following conclusions are drawn:

1. 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 which had previously been employed by graduate nurses in the institution studied.
2. Statistically significant differences were found between test scores of patients taught with the "Diabetic Teaching Tool" and those receiving unplanned instruction regardless of the duration of their diabetes. Thus 'old' diabetics were able to derive as much benefit from the teaching tool as were 'new' diabetics.
3. The level of learning demonstrated by patients taught with the "Diabetic Teaching Tool" appeared to be independent of the

following factors: age at time of teaching and testing, previous education, and age at onset of diabetes; whereas each of these factors was significantly related to the level of learning of patients receiving unplanned instruction.

4. Diabetic patients taught by means of the "Diabetic Teaching Tool" cited the nurse as a valuable source of information regarding diabetic management more than five times as frequently as did patients receiving unplanned instruction.

Implications

Success in the treatment of diabetes today depends to a large degree on the instruction of the patient in the management of the disorder under the conditions of his home life, his work and his other activities.¹

Regardless of whether or not the nurse expands her functions to include assessment, counselling, co-ordination and follow-up of diabetic patients, she will almost certainly retain a primary role in their initial and ongoing health teaching.²

The prevalence of diabetes demands that, regardless of their field of interest, all nursing personnel should be familiar with this condition and its management.³

In light of the above statements, the findings of this study have several implications for nurses likely to be interacting with diabetic patients. The following are the major implications drawn from these findings:

¹ See page 2.

² See page 5.

³ Donnell D. Etzwiler, "Who's Teaching the Diabetic?" Diabetes, XVI, No. 2 (February 1967), 116.

1. The low test scores achieved by patients in the control group of this study ($m = 54.15$ per cent) suggest that the unplanned type of diabetic patient instruction provided in many settings does not satisfy patients' learning needs regarding home management. Therefore, nurses currently employed in such settings would do well to consider other means of diabetic patient education.
2. The test scores achieved by patients in the experimental group of this study ($m = 75.97$ per cent) suggest that the "Diabetic Teaching Tool" is a useful aid to nurses providing instructions for diabetic home-management. Therefore, nurses currently employed in settings giving an unplanned type of diabetic instruction might consider this tool as one alternative in their search for more successful methods of diabetic patient education.
3. Patients in this study appeared to benefit from the planned type of instruction provided by the "Diabetic Teaching Tool" regardless of the duration of their diabetes. Therefore, nurses cannot safely assume that patients with long standing diabetes are knowledgeable and/or skilful with respect to home-management. Rather, each contact with a diabetic patient ought to be viewed and utilized by the nurse as a teaching opportunity.
4. The fact that the level of learning demonstrated by patients in the control group showed a high negative correlation with age at the time of teaching and testing (while this was not the case in the experimental group) suggests that nurses may have internalized society's bias against the learning ability of older

individuals. Nurses should be aware of this bias, and of the fact that it has not been substantiated in adult education research.⁴ They should, therefore, make a wholehearted effort to provide instructions in home management to all diabetic patients, regardless of age.

5. The fact that the level of learning demonstrated by patients in the control group showed a high positive correlation with previous education (while this was not the case in the experimental group) suggests that nurses may act on the assumption that patients with little formal education are less able to learn adequate diabetic management than patients with more schooling. Rather than omitting or diluting diabetic teaching for patients with little formal education nurses should attend to alternate ways in which the requisite knowledge and skills can be presented to these patients.

6. The fact that the level of learning demonstrated by patients in the control group showed a high negative correlation with age at onset of diabetes (while this effect was much less marked in the experimental group) suggests that nurses may put forth a greater effort to teach home management to patients whose diabetes is diagnosed at an early age than those diagnosed later in life. Nurses must be aware of this tendency and strive to overcome it by increasing the effort expended on the diabetic teaching of older individuals.

⁴ Adult Education: Theory and Method. Psychology of the Adult, (Washington: Adult Education Association of the U.S.A., 1962), p. 5.

7. The frequency with which patients in the experimental group cited the nurse as a helpful source of information about diabetic management suggests that a planned programme of diabetes patient education (such as that provided for by the "Diabetic Teaching Tool") can significantly affect the success nurses have in filling their role as initial and ongoing diabetic health-teachers.

Recommendations for Further Study

As has been frequently mentioned, current methods, techniques and devices for diabetic patient education are not adequately meeting the learning needs of the target population. The results of this study indicate that the "Diabetic Teaching Tool" designed by the researcher may have potential for improving this situation. However, before these results can be generalized to the diabetic population at large, several other avenues of research need to be pursued. The following recommendations for further study are therefore made:

1. In order to assess the durability of the learning of patients taught by means of the "Diabetic Teaching Tool," repeat testing of their knowledge and skills should be conducted six months to one year after the original test date.
2. In order to assess the transferability of the results of this study to settings other than suburban hospitals which currently have no planned programme of diabetic patient education, the procedures of the study should be replicated in a

variety of other settings (for example, public health units, physicians' offices and the diabetic out-patient departments of urban hospitals).

3. In order to assess the relative merits of the "Diabetic Teaching Tool" as compared with other planned methods of diabetic instruction, studies should be undertaken in which the learning of patients taught with the "Diabetic Teaching Tool" is compared with that of patients taught in diabetic day care centres, in diabetic clinics, in diabetic classes and in diabetic home care programmes which are currently operating.

4. In order that nurses may take into account the teacher, learner and environmental variables which predispose different patients to respond in different ways to different nurses on different occasions, studies should be undertaken in which these variables and their relation to patients' ultimate level of learning are closely examined.

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APPENDIX A

MATERIALS PERTAINING TO THE RESUME OF PRESENT KNOWLEDGE

Instruction of the Patient

Suggested Topics for Diabetic Teaching

Books for Diabetics

Pamphlets for Diabetics

Diabetic Day Care Centres

Instruction of the Patient

[in Garfield George Duncan, Diabetes Mellitus: Principles and Treatment. Philadelphia: W.B. Saunders Co., 1951]

1. General knowledge of diabetes
2. Causes of the symptoms of diabetes
 - Hunger
 - Thirst
 - Loss of weight
 - Polyuria
 - Weakness
3. Sugar in the urine
 - Source and amount
 - Relation to blood sugar
 - Tests for sugar in the urine
 - What urine specimens to test
 - Is sugar in the urine always an indication of diabetes?
4. The blood sugar
 - Normal values
 - Why blood sugar determinations are necessary
 - Range of blood sugar values in untreated diabetes and in controlled diabetes
5. Diet prescription
 - Protein, fat, carbohydrate and total calories
 - Diet menu from diet prescription
 - Selection and preparation of foods
 - Measuring of foods
 - Weighing of foods - rarely necessary
 - Distribution of diet
6. Exercise
 - Effect on patient's weight
 - Effect on blood sugar
 - Effect on need for insulin
 - Adjustment of diet and insulin needs because of exercise
7. Insulin
 - Need for insulin and dosage
 - Commercial brands and their identification
 - Administration
 - Sterilization and maintenance of equipment
 - Measurement, and mixing when indicated
 - Site of injection
 - Timing of injection

Continued . . .

Instruction of the Patient (Continued)

8. Insulin reactions (Hypoglycemia)
 - Definition
 - Symptoms
 - Treatment
 - Cause and prevention
 - Times that reactions are most likely to occur
9. Changes in body weight and diabetes
 - Loss of weight in treatment for diabetes
 - Loss of weight in untreated diabetic patient
 - Gain in weight
10. What to do in case of unretained food - vomiting or diarrhea - and in case of complete loss of appetite with aversion to food
11. Infections and diabetes
 - Sugar in urine
 - Blood sugar
 - Ketosis (coma)
 - What to do in case of infection
12. Diabetic coma (ketosis)
 - Definition
 - Causes
 - Prevention
 - What to do if ketosis is suspected
13. Care of the feet
14. Surgery and diabetes
15. Misbeliefs - especially about the outlook, insulin substitutes - there are none - and insulin addiction.

Suggested Topics for Diabetic Teaching

BOOKS AND AUTHORS			
1. <u>Diabetic Care in Pictures</u> (Rosenthal and Rosenthal) 2. <u>A Modern Pilgrims Progress in Pictures</u> (Duncan) 3. <u>Diabetic Manual</u> (Joslin) 4. <u>How to Live with Diabetes</u> (Dolger and Seeman)		Personal Factors parenthood, travel social, employ & insurance	
		Injuries & infections	
		Hygiene Eyes, teeth, hair foot care	
		Exercise	
		Blood tests	
		Urine tests	
		Insulin Shock	
		Diabetic Acidosis & Coma	
		Oral Hypoglycemics	
		Insulin Kinds of insulins Equipment Injection procedure Rotation of sites Insulin allergy	
		Diabetic Diet Meal plan Food exchanges Dietetic & food fads	
		Normal diet	
		Signs and symptoms	
		Causes of Diabetes	
		What is Diabetes?	
		Complications	
		Community Resources	

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 presented . . . In 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 Injection" chart and folder, "Tips on Filling Insulin Syringe" booklet, list of references, "Know Your Insulin Syringe" chart and site selector.	Becton-Dickinson and Co., Clarkson, Ont.	Nil
14. Insulin and Insulin Preparations	Connaught Labs., Willowdale	
15. Manual for Diabetics in Canada	Canadian Diabetic Association	75¢
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

Diabetic Day Care Centres
[in Diabetic Day Care Centres: Current Concepts.
Rexdale, Ontario: Ames Company, Division
Miles Laboratories Limited, 1969.]

A. Typical Time Table:

- 7:30 a.m. - patients arrive. Test urine for sugar and acetone, under supervision.
- 7:40 a.m. - fasting blood sugar (if required).
- 7:45 a.m. - administration of anti-diabetic drugs or insulin under supervision.
- 8:15 a.m. - breakfast.
- 9:30 a.m. - supervised activity.
- 10:30 a.m. - lecture.
- 11:30 a.m. - test urine for sugar and acetone under supervision.
- 11:45 a.m. - lunch.
- 12:30 p.m. - lecture.
- 1:30 p.m. - end of the Centre day.

B. Lecture Subjects Included:

- Diabetes Mellitus, the disease.
- Techniques of insulin injection and the care of equipment.
- Different types of insulin, and the oral hypoglycemic agents.
- Complications of diabetes, and how to avoid them.
- Diabetic self-care.
- Why and how of testing urine.
- The diet in diabetes.
- Care in special situations, such as travelling.
- Introduction to the Canadian Diabetic Association.

APPENDIX B

A BASIC COURSE IN
DIABETIC SELF-MANAGEMENT

Objectives

Content

Specifications for the Test of
Diabetic Learning

A Basic Course in Diabetic Self-ManagementObjectives

Upon completion of this course each diabetic patient will have the knowledge and skills necessary to assume primary responsibility for managing his self-care at home, that is, he will

- A. Know common terms regarding diabetes.
 - 1. re: diet -
 - a. define an exchange.
 - b. define an exchange group or exchange list.
 - c. name the C.D.A. exchange lists.
 - 2. re: complications -
 - a. define hyperglycemia.
 - b. define hypoglycemia.
- B. Know specific facts regarding diabetes.
 - 1. re: diet -
 - a. identify foods which are not permitted in a diabetic diet.
 - 2. if taking an oral hypoglycemic agent:
 - a. state the name of his drug.
 - b. state the dose of his drug.
 - c. state the time of day he takes his drug.
 - d. describe how his drug helps his diabetes.
 - 3. if taking insulin:
 - a. state the type of insulin he takes.
 - b. state the strength of insulin he uses.
 - c. state the dose of insulin he takes.
 - d. state the time of day he takes his insulin.
 - e. state what time of day he must be most wary of an insulin reaction.
 - f. describe how his insulin helps his diabetes.
 - g. state how he should store his insulin at home.
 - 4. re: exercise -
 - a. state the effect of exercise on the sugar-insulin balance of the body.
 - b. state the effect of taking more exercise than normal.
 - c. state what he would do if he took more exercise than normal.
 - d. state what he would do if he were planning more exercise than normal.
 - 5. re: urine testing -
 - a. state what he would do if his urine-sugar tests were repeatedly positive.
 - b. state what he would do if his urine-acetone were positive.

6. re: foot care -
 - a. identify the importance of careful foot care for diabetics.
7. re: complications -
 - a. match signs and symptoms with the acute complication they are indicative of.
 - b. identify symptoms of hyperglycemia.
 - c. state how his urine would test if he were severely hyperglycemic.
 - d. identify events which might cause hyperglycemia.
 - e. outline what he would do if he had a hyperglycemic reaction.
 - f. identify symptoms of hypoglycemia.
 - g. state how his urine would test if he were hypoglycemic.
 - h. identify events which might cause hypoglycemia.
 - i. outline what he would do if he had a hypoglycemic reaction.
 - j. outline what he would do if he had an acute infection.
8. re: community resources -
 - a. identify events which would merit consultation with his physician.
 - b. list community resources for diabetic assistance.
 - c. recognize how each of these persons or agencies might be helpful to him.

C. Know methods and procedures necessary for optimal diabetic management.

1. re: insulin -
 - a. list the equipment he requires to give his insulin injections.
2. re: urine testing -
 - a. state how often he should test his urine.
3. re: foot care -
 - a. outline acceptable daily foot care.
 - b. state what he would do if his feet were sweaty.
 - c. state what he would do if his feet were dry or scaly.
 - d. describe the correct method for cutting his toenails.
 - e. state what he would do for corns or callouses on his feet.
 - f. state (describe) the dangers of hot water, hot water bottles or heating pads for diabetics.

D. Understand facts and principles regarding diabetes.

1. re: diet -
 - a. explain how he would alter his diet if he were ill.
2. re: insulin injections -
 - a. outline how he decides where to give each injection.
 - b. explain why it is important to rotate the sites of his injections.

3. re: sugar-insulin balance -
 - a. explain why it is important for a diabetic to maintain a regular and balanced life-schedule.
 - b. relate the scheduling of his meals to his type of insulin.
 - c. relate exercise-time to meal-time.
 - d. relate exercise-time to his type of insulin.
4. re: urine testing -
 - a. explain the importance of urine testing.
 - b. infer what sugar in his urine might indicate.
 - c. infer what acetone in his urine might indicate.
5. re: complications -
 - a. relate hyperglycemia to uncontrolled diabetes.
 - b. explain why infection may be an acute complication of diabetes.
 - c. explain why hyperglycemia may be an acute complication of diabetes.
 - d. explain why hypoglycemia is an acute complication of diabetes.
 - e. explain why it is important for a diabetic to wear or carry diabetic identification.

E. Demonstrate correct usage of skills necessary for optimal diabetic management.

1. re: diet -
 - a. given his own meal plan and the C.D.A. exchange lists, plan his total day's menu.
2. re: insulin injections -
 - a. handle his syringe and needle in such a way as not to contaminate them.
 - b. use aseptic technique in preparing and giving his insulin injection.
 - c. demonstrate accuracy in preparing and giving his insulin injection.
 - d. demonstrate adequate daily care of his syringe and needle by disinfection with alcohol.
 - e. demonstrate adequate weekly care of his syringe and needle by sterilization by boiling.
3. re: urine testing -
 - a. following the prescribed procedure for the urine-sugar test he uses, test urine specimens accurately.
 - b. following the prescribed procedure for the urine-acetone test he uses, test urine specimens accurately.

A Basic Course in Diabetic Self-ManagementContentI. INTRODUCTION

- A. What is diabetes?
 - 1. How does a nondiabetic person use the food he eats?
 - 2. What happens when you have diabetes?
- B. How do you find out that you have diabetes?
- C. What will diabetes mean for your life?
 - 1. How many people have diabetes?
 - 2. What kind of work can you do?
 - 3. Can you get life insurance?
 - 4. What about sports and activities?
 - 5. What about marriage and children?
 - 6. How can you be sure to stay healthy?

II. DIET

- A. What makes up a normal healthy diet?
 - 1. Carbohydrate.
 - 2. Fat.
 - 3. Protein.
- B. How is a diabetic diet different?
 - 1. Outline.
 - 2. Foods not allowed.
 - 3. Goals.
- C. How will the doctor figure out the best diet for you?
 - 1. Age.
 - 2. Sex.
 - 3. Weight.
 - 4. Activity.
 - 5. Health.
- D. What will you need to follow your diet?
 - 1. Your own Meal Plan.
 - a. Definition.
 - b. Illustration.
 - 2. Food Exchange Lists.
 - a. Definitions.
 - b. Names of the Exchange Groups.
 - c. Use of the food exchange lists for following the meal plan.
- E. How should you prepare these foods?
 - 1. General rules.
 - 2. Measurement.
 - 3. Mixed dishes.
- F. General Rules About Diabetic Diets.
- G. Other Considerations.
 - 1. Food shopping.
 - 2. Special foods.
 - 3. Alcohol.
 - 4. Restaurant eating.
 - 5. Illness.
 - 6. C.D.A. counselling service.

III. DRUGS

A. Antidiabetic Pills

1. Names and action.
2. How they differ from insulin.
3. Side effects.
4. Rules for taking them.

B. Insulin

1. Review function of insulin.
2. Names and duration of action.
 - a. Short-acting
 - i. regular ii. semi-lente
 - b. Intermediate-acting.
 - i. N.P.H. ii. lente iii. globin
 - c. Long-acting
 - i. P.Z.I. ii. ultra-lente
3. Identification of types of insulin.
4. Peak of action of three groups of insulin.
5. Measurement of insulin.
 - a. Define 'units per cc'.
 - b. Differentiate U40 from U80.
 - i. strength
 - ii. colour of stopper and print
6. Care of insulin.
 - a. temperature.
 - b. expiry date.
7. Cost of insulin.
8. Equipment for insulin injection.
 - a. Insulin syringe.
 - i. U40 vs. U80 ii. cost iii. glass vs. disposable
 - b. Needles.
 - i. size ii. cost iii. reusable vs. disposable
 - c. Container for syringe and needles.
 - d. Alcohol.
 - e. Cotton.
 - f. Hints for buying equipment.
9. Insulin injection procedure.
 - a. Principles.
 - i. accuracy ii. asepsis
 - b. Steps for injecting one type of insulin.
 - i. preparation ii. injection
 - c. Preparation if mixing two insulins.
 - d. Rotation of sites.
 - i. sites available
 - ii. how to
 - iii. reasons for rotation
10. Care of Insulin Injection Equipment.
 - a. Daily care--Storage in Alcohol.
 - i. principles ii. equipment iii. steps
 - b. Weekly care--Boiling.
 - i. principles ii. equipment
 - iii. steps iv. cloudiness
11. Rules for taking insulin.

C. How Diet and Insulin Work Together

1. Importance of balance.
2. Relation of meal times to type of insulin.

IV. EXERCISEA. Exercise is good for everybody.B. What effect does exercise have on diabetes?C. What kinds of exercise can diabetics do?D. Planning for exercise.

1. with doctor.
2. regular routine.

E. Diet, insulin and exercise work together.

1. Importance of balance.
2. Unexpected exercise.
3. Time of exercise in relation to meals.
4. Time of exercise in relation to type of insulin.
5. Importance of carrying sugar.

F. General Rules for ExercisingV. HYGIENEA. Why is good hygiene so important to diabetics?B. General Rules.

1. Care with sharp objects.
2. Care of skin and hair.
3. Care of teeth and gums.
4. Care of eyes.
5. Care of minor cuts and bruises.
6. Smoking.

C. Special Foot Care

1. Importance.
2. Equipment.
3. General rules for foot care.
4. Special considerations.
 - a. sweaty feet.
 - b. dry, scaly feet.
 - c. cutting toenails.
 - d. corns, callouses.
 - e. heating pads, hot water, hot water bottles.

VI. TESTSA. Purpose of testing.B. Kinds of tests.

1. Blood.
 - a. kinds
 - b. where done
 - c. how often
 - d. who done by

2. Urine.
 - a. kinds
 - b. where done
 - c. how often
 - d. who done by
 - e. which urine should be tested
(N.B. double-voided specimen)
 - f. what does each test tell
3. Testing urine for sugar.
 - a. Clinitest tablets.
 - i. equipment
 - ii. 5-drop method
 - iii. "Pass-Through"
 - b. Other tests for sugar.
 - i. names
 - ii. comparison of cost, convenience, accuracy
 - c. Action for repeated positive tests.
4. Testing urine for acetone.
 - a. (Ames) Acetest tablets.
 - i. equipment
 - ii. procedure
 - b. Other tests for acetone.
 - i. names
 - ii. comparison of cost, convenience, accuracy
5. Keeping a record of urine testing.
6. General rules for urine testing.

VII. THE DIABETIC IN TROUBLE

- A. Diabetic Coma
 1. Definition.
 2. Other names for it.
 3. What happens when you get it?
 4. Signs and symptoms.
 - a. physical signs.
 - b. urine tests.
 5. What might cause it?
 6. Treatment of acute hyperglycemia.
 7. How can you keep it from happening?
- B. Insulin Reaction
 1. Definition.
 2. Other names for it.
 3. What happens when you get it?
 4. Signs and symptoms.
 - a. physical signs.
 - b. urine tests.
 5. What might cause it?
 6. Treatment of insulin shock.
 7. How can you keep it from happening?
- C. Comparison of Hypo- and Hyper-glycemia
 1. onset
 2. warning signs
 3. urine sugar
 4. action to take

- D. Infections
 - 1. Definitions.
 - a. simple.
 - b. more serious (acute).
 - 2. Why may infections mean trouble for diabetics?
 - 3. How can you keep from getting infections?
 - 4. What to do if you get an acute infection.
- E. Diabetic Identification
 - 1. Kinds.
 - 2. Importance.
 - 3. Where they can be obtained.

VIII. WHERE THE DIABETIC CAN GET HELP

- A. People and Agencies
 - 1. Physician.
 - 2. Canadian Diabetic Association.
 - 3. Victorian Order of Nurses.
 - 4. Public Health Nurses.
 - 5. Medic Alert Foundation.
 - 6. Health Teaching Clinics for Diabetics.
 - 7. Dial-a-Dietician.
- B. What will these people or agencies do for you?

IX. SUMMARY

Points to remember - re:

- 1. diet.
- 2. insulin.
- 3. exercise.
- 4. records.
- 5. I.D.
- 6. good use of doctor.

A Basic Course in Diabetic Self-Management
Specifications for the Test of Diabetic Learning

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	20	30	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	50	125	70	30	100

APPENDIX C

DATA COLLECTION TOOLS

Patient Profile Sheet

Test of Diabetic Learning

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. OCCUPATION

own _____
spouse's or parent's _____
retired? _____

E. EDUCATION

Highest level of education attained:

F. REASON FOR CURRENT ADMISSION TO HOSPITAL

1. new diabetic
2. regulation of diabetes
3. complication of diabetes
4. unrelated condition

G. MOST RECENT PREVIOUS HOSPITAL ADMISSION

1. less than 6 weeks ago
2. over 6 weeks-under 1 yr.
3. 1-5 years
4. 6-10 years
5. over 10 years

H. AGE AT ONSET OF DIABETES

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

I. DURATION OF DIABETES

1. 0-6 days
2. 1-5 weeks
3. 6 weeks-11 months
4. 1-5 years
5. 6-10 years
6. over 10 years

J. CONTROL OF CONDITION

1. diet and antidiabetic pill
2. diet and less than 30 units insulin
3. diet and more than 30 units insulin

K. BEST SOURCES OF INFORMATION RE: MANAGEMENT OF DIABETES
(Please rank 1, 2, 3, ... 10.)

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

L. ANTIDIABETIC PILLS:

Name _____
Dose _____ (milligrams)
Time _____

M. INSULIN: Name _____
Strength _____
Dose _____ (units)
Time _____

N. URINE TESTING: Reagents _____ & _____
Time(s) _____

O. DIET PLAN: Attached

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?
- insulin reaction.
 - diabetic coma.
 - muscle cramps.
 - an infection.
12. What would you do if you had taken more exercise than normal?
- take only $\frac{1}{2}$ the usual amount of insulin the next day.
 - eat twice as much bread at the next meal.
 - take twice the usual amount of insulin the next day.
 - 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
- soak it in hot water and apply a sterile bandage.
 - soak it in cold water and apply iodine.
 - wash it well with warm water and apply a sterile bandage.
 - 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
- trim them carefully with manicure scissors.
 - treat them with a commercial corn and callous remover.
 - notify your doctor.
 - 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. On the answer sheet write the letter of the complication which each is characteristic of. Each response in Column B may be used once, more than once or not at all.
- | COLUMN A | COLUMN B |
|--------------------------|---------------------|
| (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
- A. take your prescribed insulin.
 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 some extra insulin.
 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 insulin and eat less.
 B. skip your urine tests.
 C. take your regular insulin and eat less.
 D. 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 corn or callous. | 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 by various people or organizations for diabetics. On the answer sheet write 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 A

- (1) adjust your diet prescription
- (2) provide free diet counselling
- (3) adjust your prescription for insulin
- (4) give insulin injections at home

COLUMN B

- A. Victorian Order of Nurses
- B. Canadian Diabetic Association
- C. doctor

TEST OF DIABETIC LEARNING
(for Insulin Users)

PART I: KNOWLEDGE

Patient Number: _____

Answer Sheet

Score: _____

1. (A) True False
(B) True False
(C) True False
(D) True False
(E) True False

2. _____

3. (A) True False
(B) True False
(C) True False
(D) True False

4. True False

5. (A) _____
(B) _____
(C) _____
(D) _____
(E) _____
(F) _____

(G) Yes No

(H) Yes No

(I) A B C D E

6. True False

7. (A) True False

(B) True False

(C) True False

(D) True False

8. (A) True False

(B) True False

(C) True False

(D) True False

(E) True False

9. True False

10. True False

11. A B C D

12. A B C D

13. (A) True False

(B) True False

(C) True False

14. A B C D

15. A B C D

16. (A) True False

(B) True False

(C) True False

(D) True False

17. (A) True False

(B) True False

(C) True False

(D) True False

18. _____ (1)

_____ (2)

_____ (3)

_____ (4)

_____ (5)

_____ (6)

19. A B C D

20. A B C D E

21. A B C D E

22. A B C D

23. (A) True False

(B) True False

(C) True False

(D) True False

(E) True False

(F) True False

(G) True False

(H) True False

24. _____ (1)

_____ (2)

_____ (3)

_____ (4)

TEST OF DIABETIC LEARNING
(for Antidiabetic Pill Users)

PART I: KNOWLEDGE (70 points)

DO NOT WRITE ANYTHING ON THIS PAPER!!

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

1. 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
2. What are the names of the Canadian Diabetic Association Exchange Groups?
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 $\frac{1}{2}$ 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. On the answer sheet write the letter of the complication which each is characteristic of. Each response in Column B may be used once, more than once or not at all.
- | COLUMN A | COLUMN B |
|--------------------------|---------------------|
| (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 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 a corn or callous. | 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 by various people or organizations for diabetics. On the answer sheet write 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 A

- (1) adjust your diet prescription.
- (2) provide free diet counselling.
- (3) adjust your prescription for antidiabetic drug.
- (4) give insulin injections at home.

COLUMN B

- A. Victorian Order of Nurses
- B. Canadian Diabetic Association
- C. Doctor

TEST OF DIABETIC LEARNING
(for Antidiabetic Pill Users)

PART I: KNOWLEDGE

Patient Number: _____

Answer Sheet

Score: _____

1. (A) True False
(B) True False
(C) True False
(D) True False
(E) True False

2. _____

3. (A) True False
(B) True False
(C) True False
(D) True False

4. True False

5. (A) _____
(B) _____
(C) _____
(D) _____

6. True False

7. (A) True False
(B) True False
(C) True False
(D) True False

8. (A) True False
(B) True False
(C) True False
(D) True False
(E) True False

9. True False

10. True False

11. A B C D

12. A B C D

13. (A) True False

(B) True False

(C) True False

14. A B C D

15. A B C D

16. (A) True False

(B) True False

(C) True False

(D) True False

17. (A) True False

(B) True False

(C) True False

(D) True False

18. _____ (1)

_____ (2)

_____ (3)

_____ (4)

_____ (5)

_____ (6)

19. A B C D

20. A B C D E

21. A B C D E

22. A B C D

23. (A) True False

(B) True False

(C) True False

(D) True False

(E) True False

(F) True False

(G) True False

(H) True False

24. _____ (1)

_____ (2)

_____ (3)

_____ (4)

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 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.		
Reads greater than 2% 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: SKILLSC. Insulin Procedures (20 points)

Patient Number: _____

Score: _____

1. Insulin Injection

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)		

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

2. Daily Care of Equipment -- Storage in Alcohol

STEPS	YES	NO
(1) Uses 70% isopropyl or rubbing alcohol.		
(2) Uses clean container.		
(3) EITHER separates parts of syringe (and needle) OR draws alcohol into syringe 2 or more times.		
(4) Covers syringe (and needle) with the alcohol.		
(5) Leaves parts of syringe (and needle) submerged in alcohol for at least 20 minutes.		
(6) Reassembles syringe without contaminating it.		
(7) Attaches needle to syringe without contaminating either.		
(8) EITHER leaves syringe (and needle) in alcohol whenever not in use OR stores syringe (and needle) in such a way that they are not contaminated.		
(9) Knows to replace alcohol (a) if it evaporates; (b) if it becomes discolored.		

SCORE = $\frac{\# \text{Yes}}{2}$ (total possible = 5)

3. Weekly Care of Equipment -- Boiling

STEPS	YES	NO
(1) Separates parts of syringe (and needle).		
(2) EITHER places parts of syringe (and needle) in sieve OR lines pot with cloth to prevent breakage.		
(3) Covers all parts with water.		
(4) Boils all parts in water for at least 10 minutes.		
(5) Removes parts from water without contaminating them.		
(6) Ejects all water from syringe.		
(7) Stores syringe (and needle) in such a way that they do not become contaminated.		
(8) Knows to either soak syringe in vinegar or boil it in vinegar and water before sterilizing to remove scale.		

SCORE = $\frac{\# \text{Yes}}{2}$ (total possible = 4)

SCORING INSULIN TESTS: $\frac{\quad}{11}$ on insulin injection
 $\frac{\quad}{5}$ on daily care of equipment
 $\frac{\quad}{4}$ on weekly care of equipment

APPENDIX D

DIABETIC TEACHING TOOL

Introduction to the Diabetic Teaching Tool

Contents of the Easel Binder

Contents of the Carrying Case

INTRODUCTION TO THE DIABETIC TEACHING TOOL

Philosophy of the Diabetic Teaching Tool

Increased patient knowledge of techniques of diabetic self-care should result through use of the Diabetic Teaching Tool because it offers illustrations, uncomplicated terminology, and the active assistance of nursing personnel.

Purpose of the Diabetic Teaching Tool

To present and clarify the information the diabetic patient needs to assume responsibility for managing his self-care at home.

What is the Diabetic Teaching Tool?

The Diabetic Teaching Tool is a teaching aid designed to assist nurses with the instruction of diabetic patients.

The basic components of the Diabetic Teaching Tool are:

1. An easel binder, sized for use on the patient's overbed table. Specific pages in this binder have been designed to deal with the major content areas of diabetic teaching and learning. The binder is designed in such a way that each poster contains a message, which is conveyed to the patient in a pictorial image. At the same time, on the back of the preceding poster are the "nurse's instructions". These instructions pertain to the poster the patient is currently looking at. They will assist the nurse in her teaching of that particular aspect of diabetic self-care.
2. A carrying case containing:
 - (1) Kardex slips, one to be attached to the Kardex of each diabetic patient.
 - (2) Take-home folders, one to be given to each diabetic patient.
 - (3) An assortment of individual 8½" by 11" pages, each corresponding in content and design to one or more posters in the easel binder. Prescription type format has been utilized on several of these pages, to allow individualization of the information to the patient's own interests, needs and level of clinical control. From this assortment, those pages which apply directly to each patient's care are to be given to him for inclusion in his "Take-home folder".
 - (4) "Meal Planning for Diabetics in Canada" pamphlets, one to be given to each diabetic patient.

- (5) "Right from the Start", Clinitest instruction kits, one to be given to each diabetic patient.
- (6) "Diabetic Supplies" lists, one to be given to each diabetic patient, along with his medical prescription, on discharge.
- (7) Consent Forms (#2) - two to be signed by each patient.

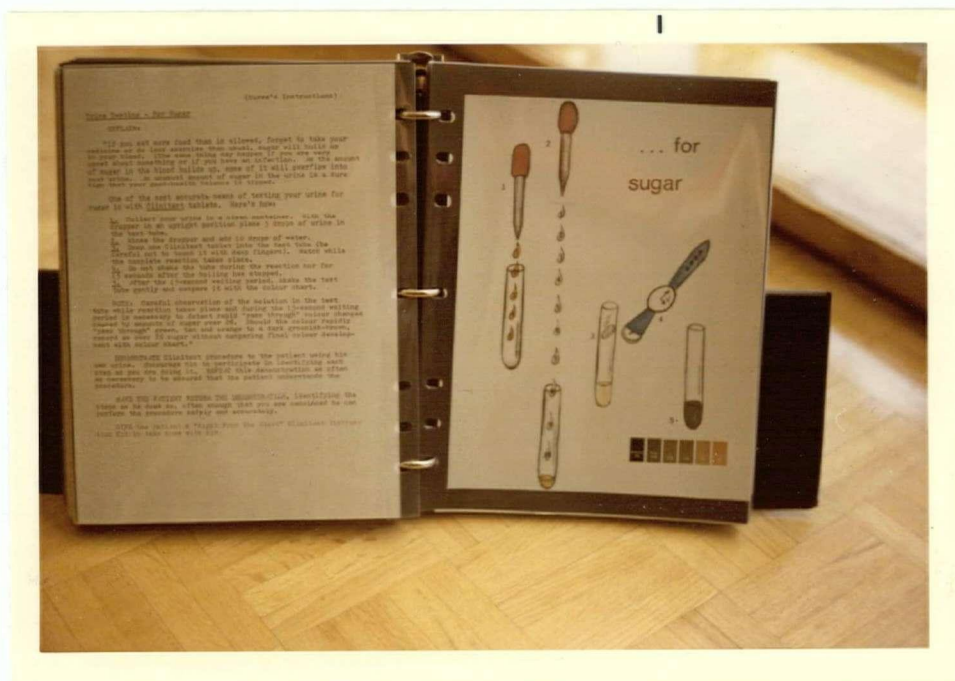
How to Use the Diabetic Teaching Tool

1. Approach each diabetic patient (new or old) who is admitted to your ward. Explain to him that Surrey Memorial Hospital is cooperating with a graduate nursing student in testing a diabetic teaching aid. Would he be willing to participate. If so, review consent form #2 with him, and complete two copies by filling in the body of the consents and having the patient sign them. Leave one copy of the consent at the patient's bedside, and file the other on his chart.
2. Attach one of the Kardex slips to the patient's Kardex. As each section of teaching is completed, it should be initialled on the Kardex slip. In that way, should there be any change of staff, the second nurse would know where to take up the teaching. Moreover, it is good insurance that nothing is omitted.
3. Give the patient one of the Take-home folders. Each of these contains a title page, a brief introduction and a list of the topics which his nurse will discuss with him. As teaching progresses, add the pages indicated in the "Instructions to the Nurse", being sure to complete those which contain blanks. Only those pages which apply directly to the patient's care should be given him to take home (for example, antidiabetic pill users should not receive take-home sheets on insulin; the drug, the injection process, or the care of the equipment).
4. Proceed through the Diabetic Teaching Tool at the patient's own pace. If he is rushed, it is likely that his learning will be limited.
5. Work on only one section at a time, and stay with that topic until the patient seems to have mastered it (for example, if the patient is an insulin-user, teaching should be frozen at the "medicine" section until the patient is able to give his own injections satisfactorily).
6. Once a section has been completed, encourage the patient to take over as much of that aspect of his care as is possible (e.g. (1) Having learned about diet, he should mark his own menus.
(2) Having learned about his medication, he should give his own injections.
(3) Having learned about urine testing, he should take responsibility for doing his own tests and recording the results).

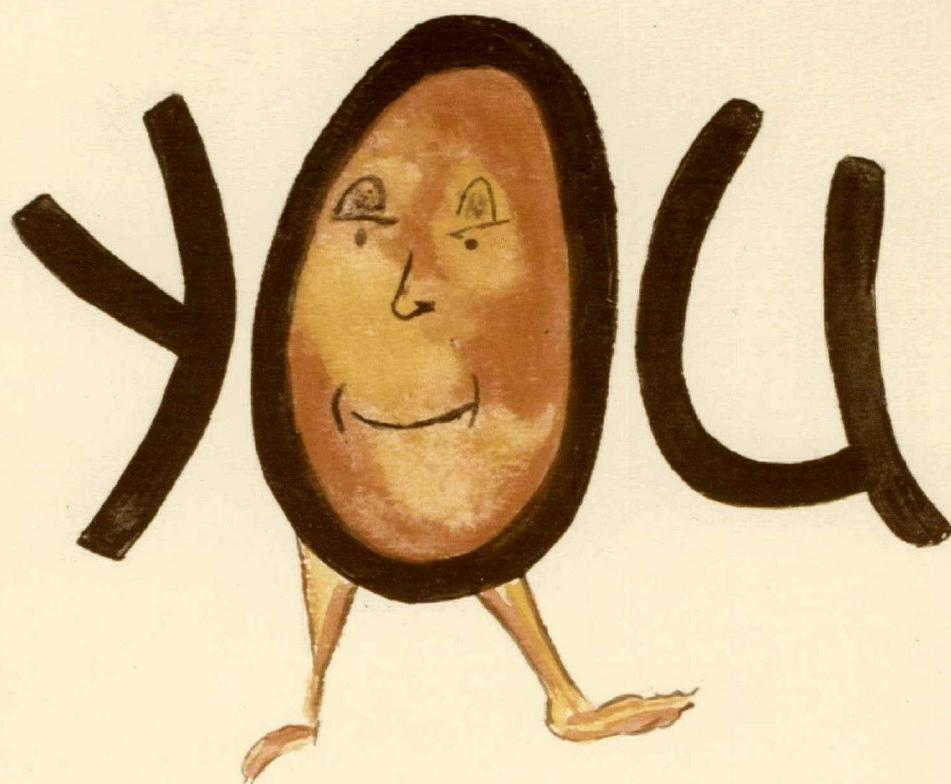
PHOTOGRAPH SHOWING USE OF THE
DIABETIC TEACHING TOOL



PHOTOGRAPH OF THE EASEL BINDER SECTION ^a
OF THE DIABETIC TEACHING TOOL



a. Contents of the easel binder are found on pages 145 to 244, following.



and diabetes

Introduction

EXPLAIN:

"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 six parts:

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

I shall work with you on this course. I shall only go as fast as you want me to. Most of the things I will teach you are things that you will do yourself every day at home. Ask me lots of questions to be sure you understand what I'm talking about. Remember, in the long run, your diabetic care is up to you!

introduction

Food-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.

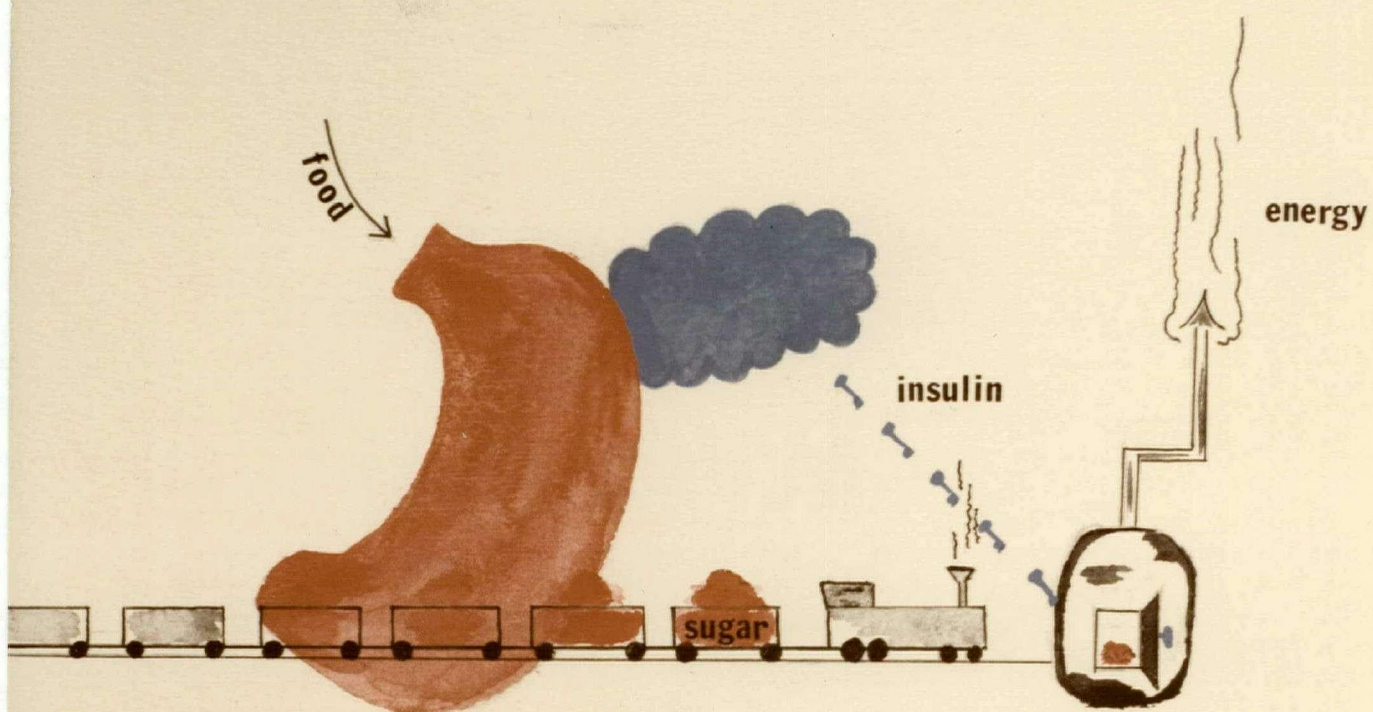
The body's biggest sources of fuel are sweet and starchy foods such as sugar, bread and cereals. However, other foods (such as meat, fruit and vegetables) can provide fuel too. After these foods are swallowed, the body changes them all to a simple form of sugar. It is this sugar which the cells use as 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 poster provided - by pointing out where organs or processes occur - wherever possible.

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



food — energy
cycle

Diabetic Food-Energy Cycle

EXPLAIN:

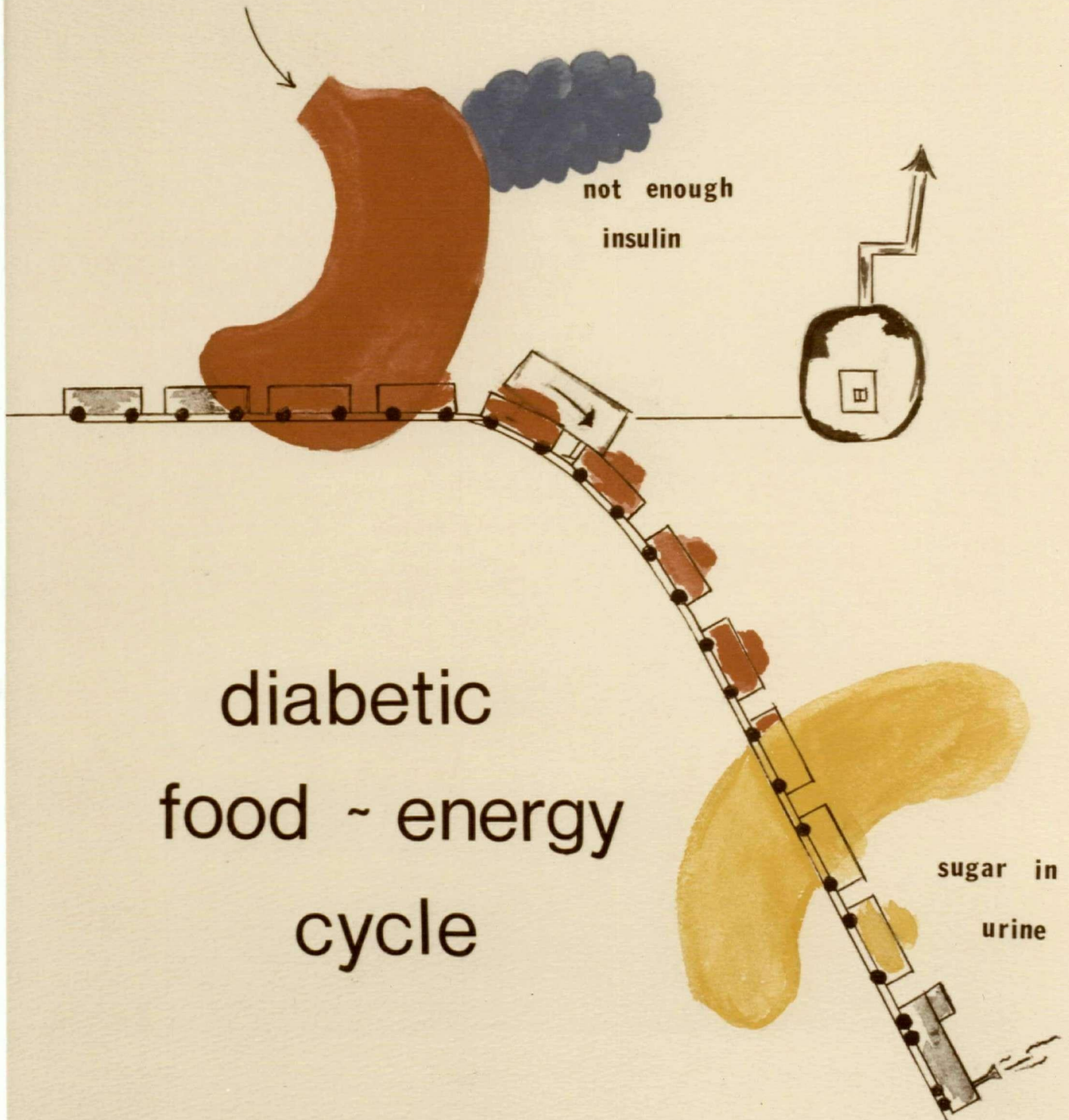
"As we said, insulin may be thought of as the key that opens the cell door to let sugar in. If your body is short of insulin for some reason, sugar won't be able to get into your cells.

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 poster provided - by pointing out where organs or processes occur - wherever possible.

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



Symptoms

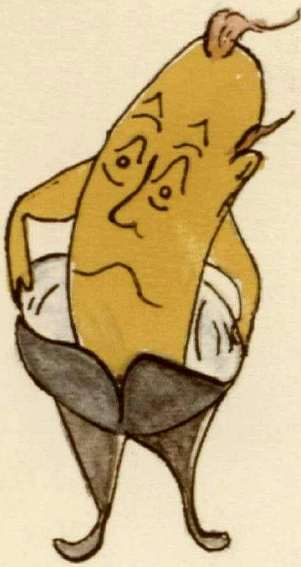
EXPLAIN:

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

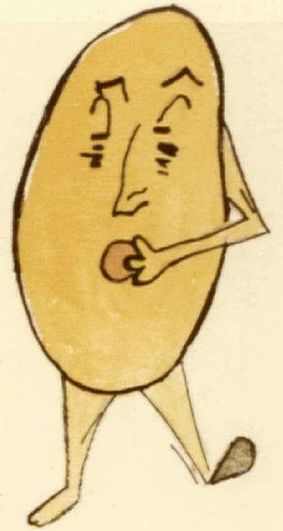
- "1. Because your body wasn't making enough insulin to allow your food-energy cycle to work properly -- therefore the amount of sugar in your blood rose and spilled over into your urine. Your kidneys had to work overtime to get rid of this sugar -- therefore you likely has to pass large amounts of urine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

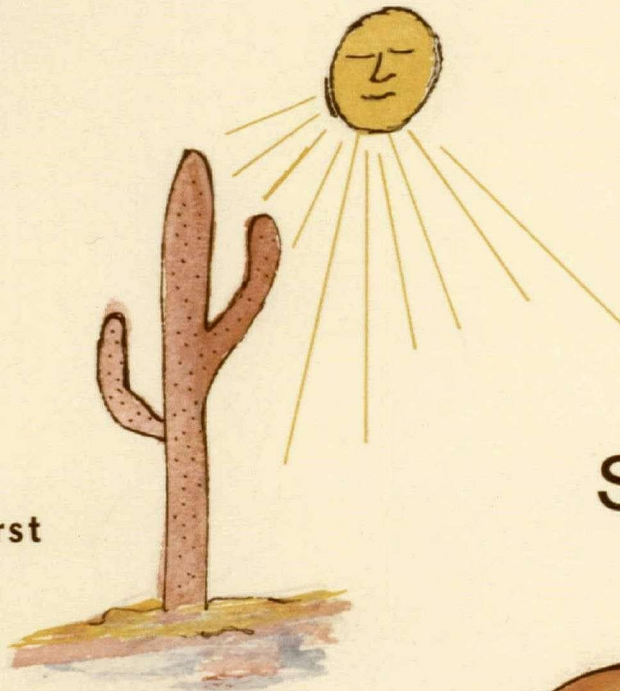
GIVE the patient the sheet titled "Symptoms" for his Take-home folder.



Weight Loss

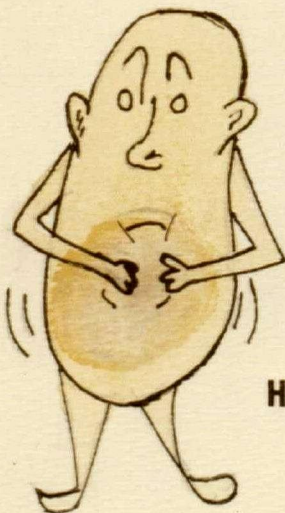


Tired

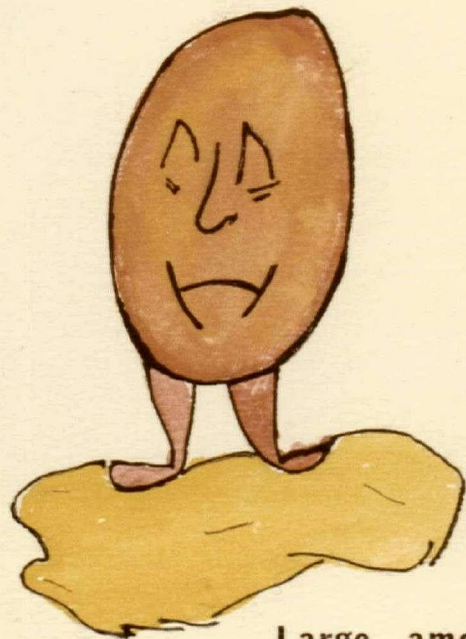


Thirst

symptoms



Hunger



Large amounts
of urine

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

The page features 50 small, stylized faces of men, each with a unique expression and hair color. The faces are scattered across the page, with one face in the upper right quadrant circled in black. The text "one in every fifty" is written in a simple, black, sans-serif font, with "one in every" on the first line and "fifty" on the second line, positioned in the center of the page.

one in every
fifty

canadians

General Questions

DISCUSS any of the following material which is of concern to the patient:

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

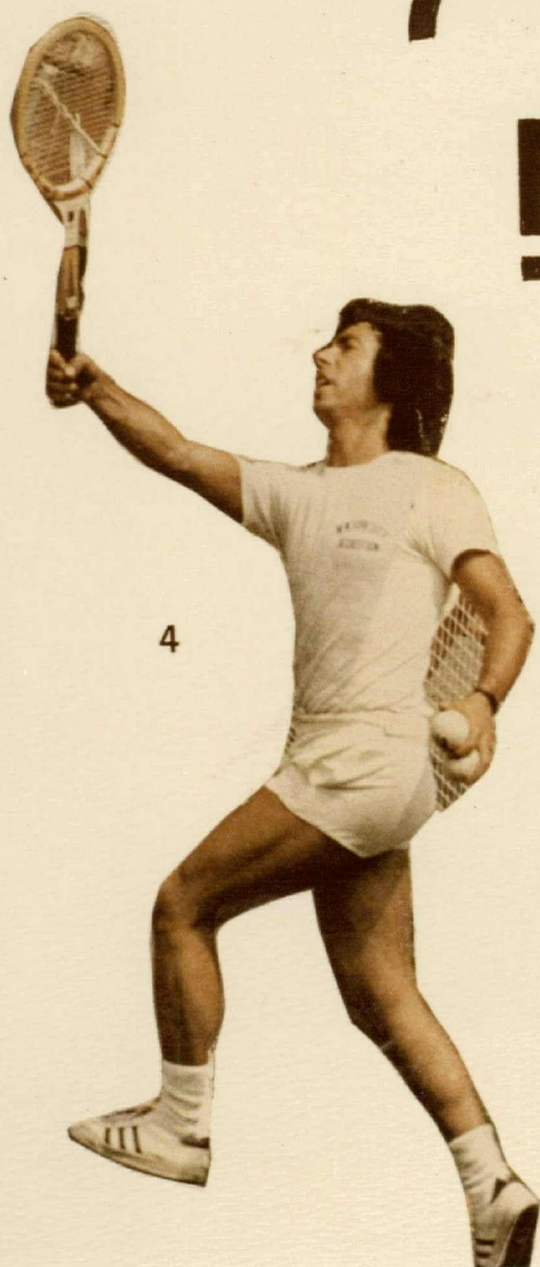
"Diabetes should not stop you from working. Indeed, it probably won't even have much effect on the kind of work you can do. People with diabetes are engaged in almost every kind of work you could name (from desk jobs to labour to housework). Studies have shown that they do as well in their work -- in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



Balance = 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.

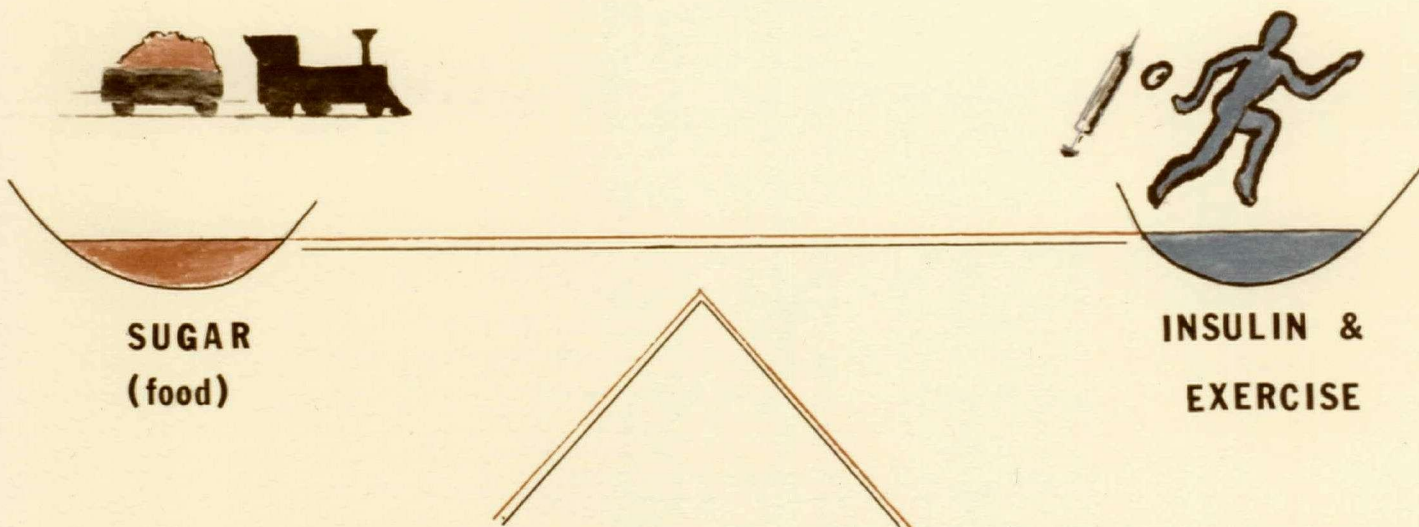
Tipping the balance to either side will result in problems. Keeping it even will result in good health."

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

balance =

good health



Diet

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

diet

Kinds 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.

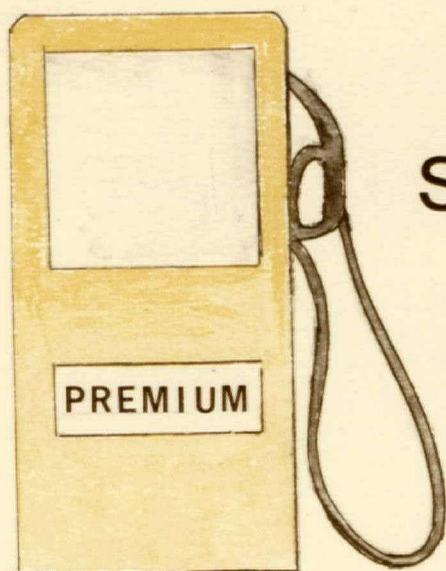
In planning your diet, your doctor will make sure that you eat some carbohydrates, some proteins and some fats at every meal.

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."

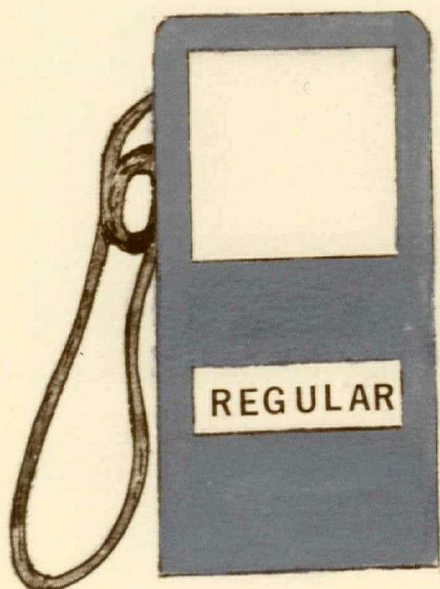
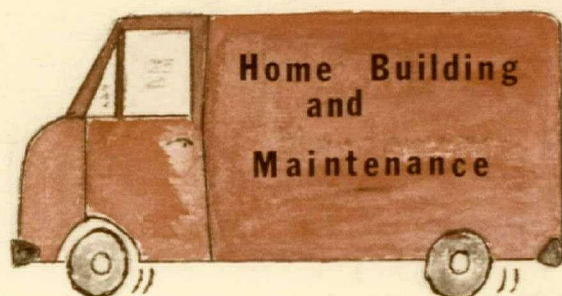
GIVE the patient the sheet titled "Kinds of Food" for his take-home folder.

kinds of food



carbohydrates
sugar, bread, cereals,
fruit, vegetables.

protein
milk, cheese,
eggs, meat, fish.



fat
butter, nuts,
bacon.

How 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.

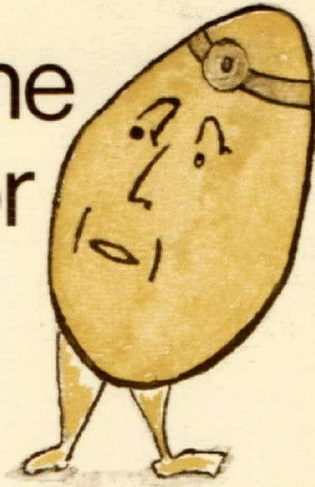
5. Over-all Health

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

how the
doctor



plans your diet . . .

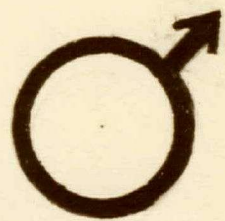
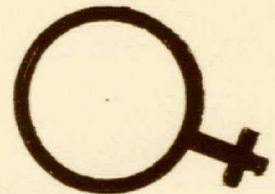
age

weight

sex

activity

over-all health



Things 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 dietitian; 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 the 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 dietitian. REVIEW the patient's own meal plan with him, pointing out how much of the various food types he may have at each meal. Keep this review general, i.e. "one portion of fruit, two portions of meat," etc.

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."

things you need to follow your diet

EXCHANGE LISTS

FOR

meal planning

FOR DIABETICS IN CANADA



BREAKFAST

Fruit	Exchange(s) List 3
Meat	Exchange(s) List 5
Bread	Exchange(s) List 4
Fat	Exchange(s) List 6
Milk	Exchange(s) List 1

MID-MORNING SNACK

LUNCHEON OR SUPPER

Meat	Exchange(s) List 5
Vegetable	Exchange List 2A
Vegetable (if desired)	Exchange List 2B
Bread	Exchange(s) List 4
Fat	Exchange(s) List 6
Fruit	Exchange(s) List 3
Milk	Exchange(s) List 1

MID-AFTERNOON SNACK

DINNER OR MAIN MEAL

Meat	Exchange(s) List 5
Vegetable	Exchange List 2A
Vegetable (if desired)	Exchange List 2B
Bread	Exchange(s) List 4
Fat	Exchange(s) List 6
Fruit	Exchange(s) List 3
Milk	Exchange(s) List 1

EVENING SNACK

Exchange 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."

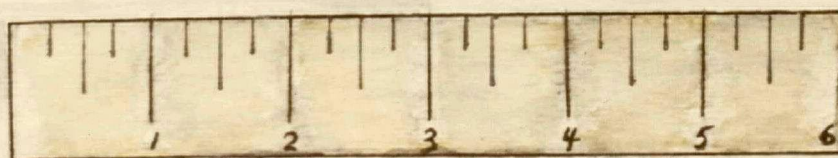
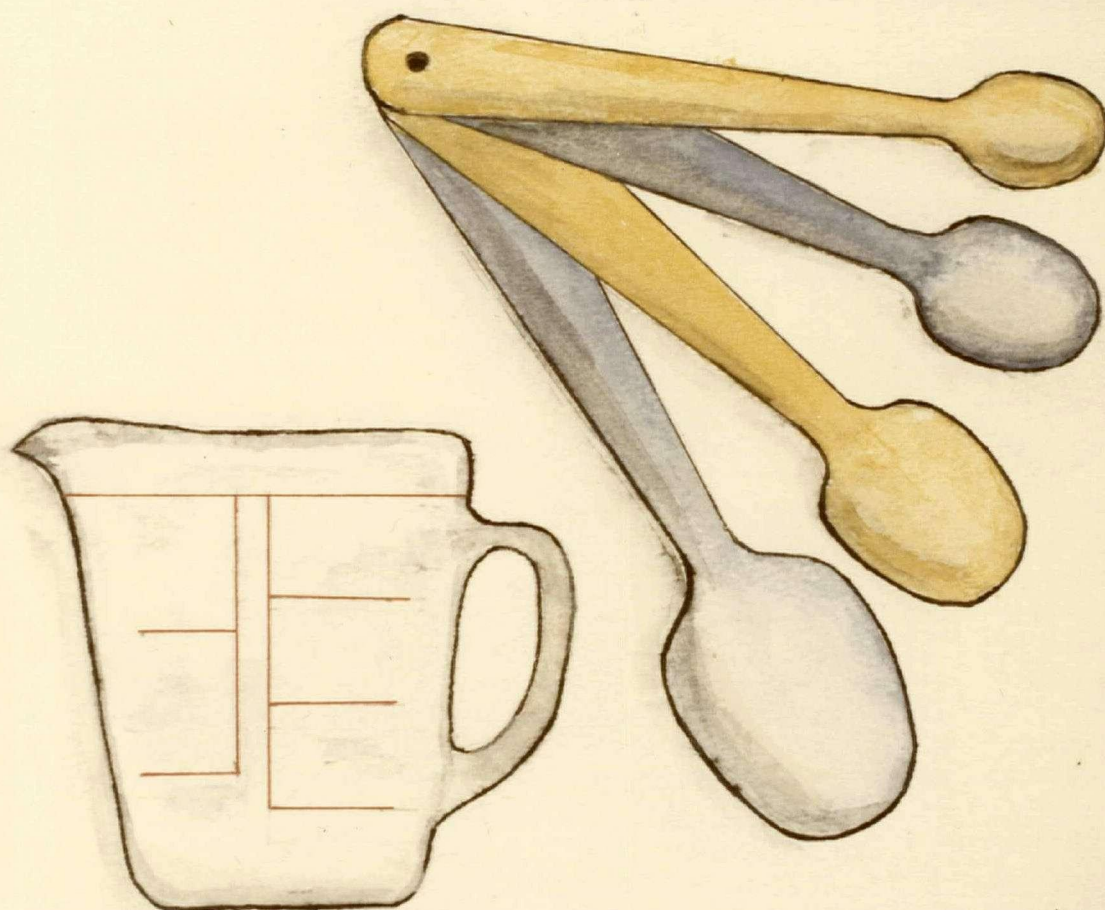
GIVE the patient the sheet titled "Things You Need to Follow Your Diet" and "Exchange System" for his Take-home folder.

BE SURE that the 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 patient by means of the following nine posters.

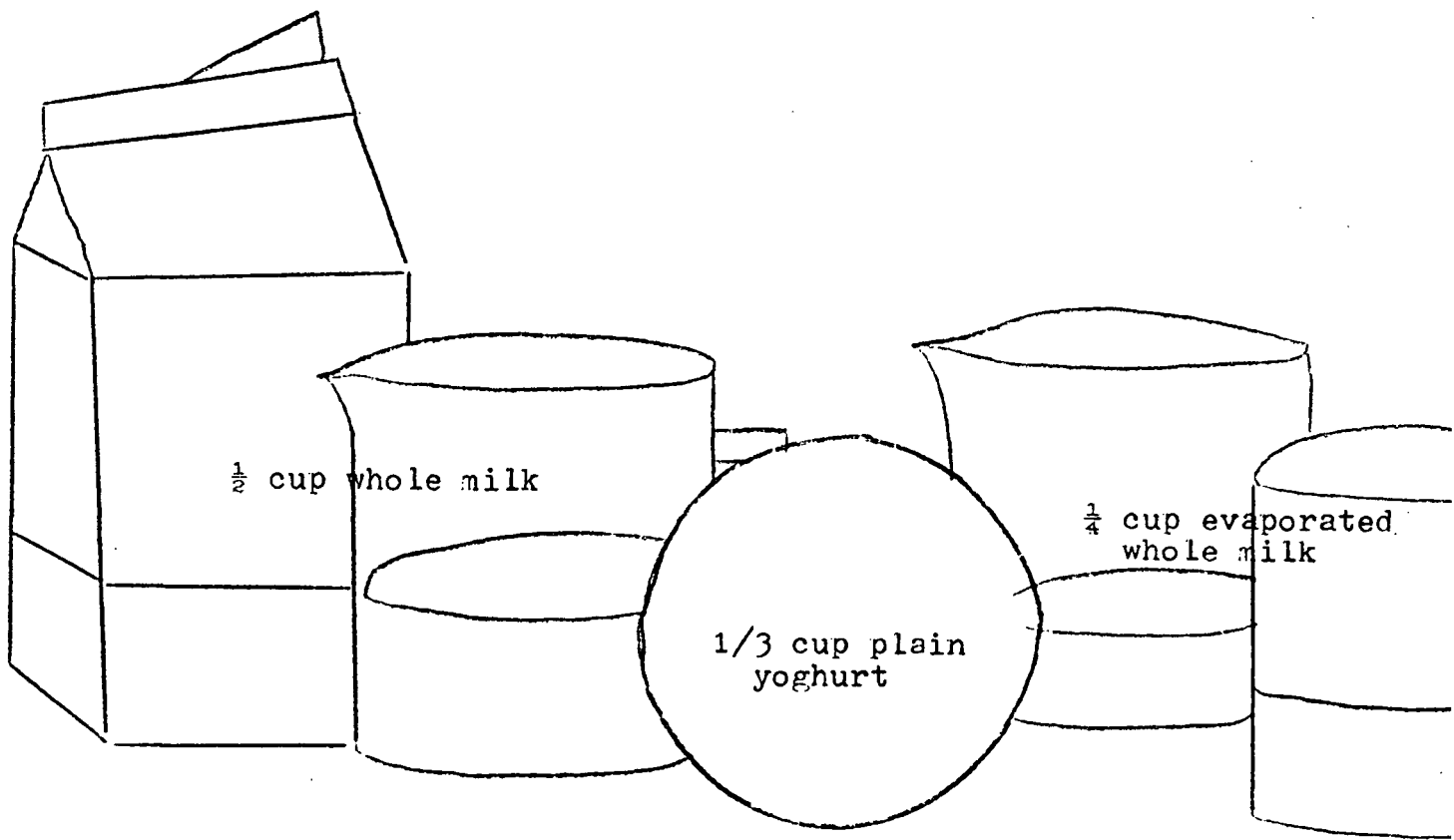
exchange system

1 exchange = 1 measured
serving



Milk Exchanges

REVIEW the milk exchanges shown in this picture with the patient. HELP him to locate each in his "Meal Planning" booklet. EMPHASIZE that any of these milk products in the amount shown is equal to one milk exchange.

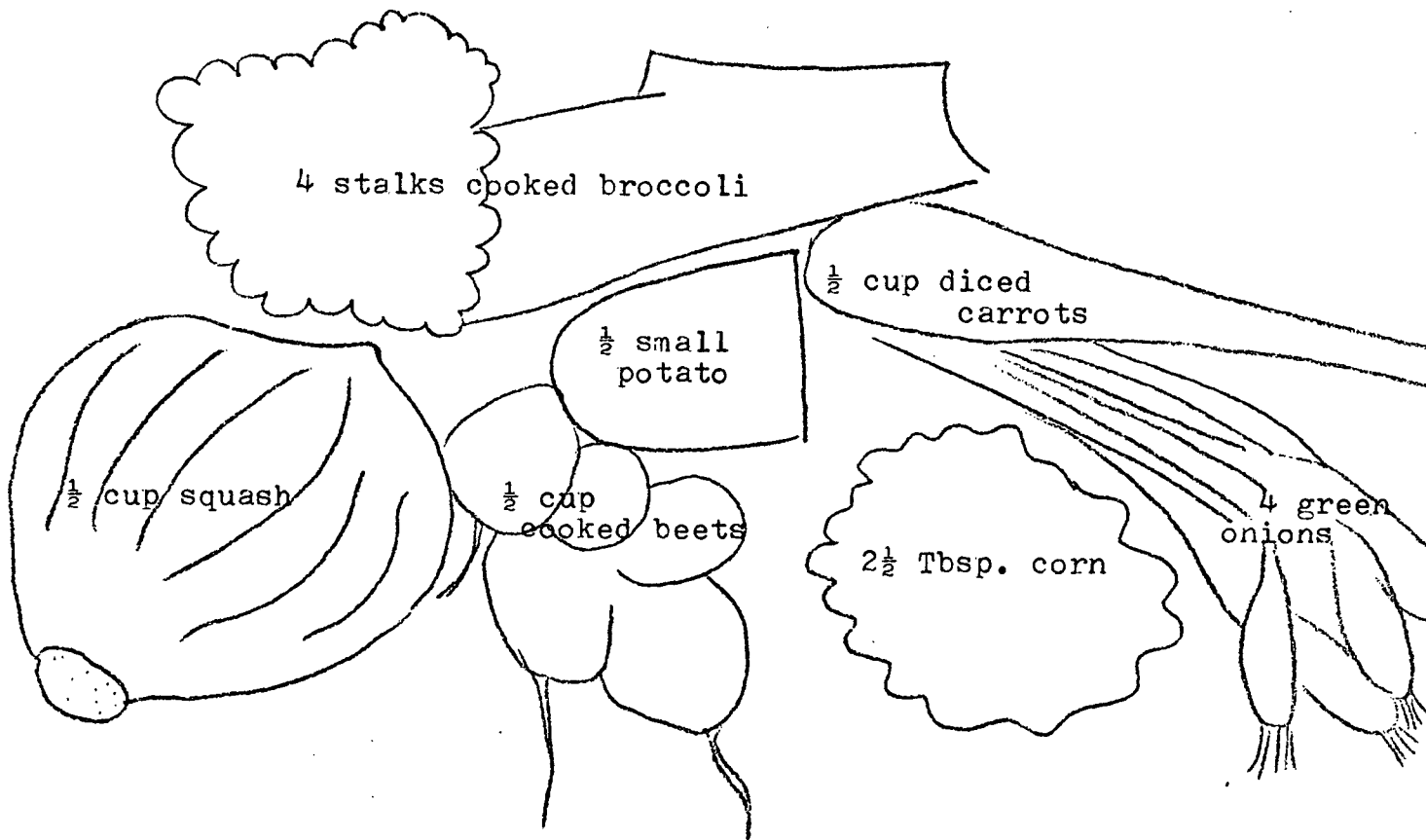




milk

Vegetable A Exchanges

REVIEW the vegetables shown in this picture with the patient. HELP him to locate each in his "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.

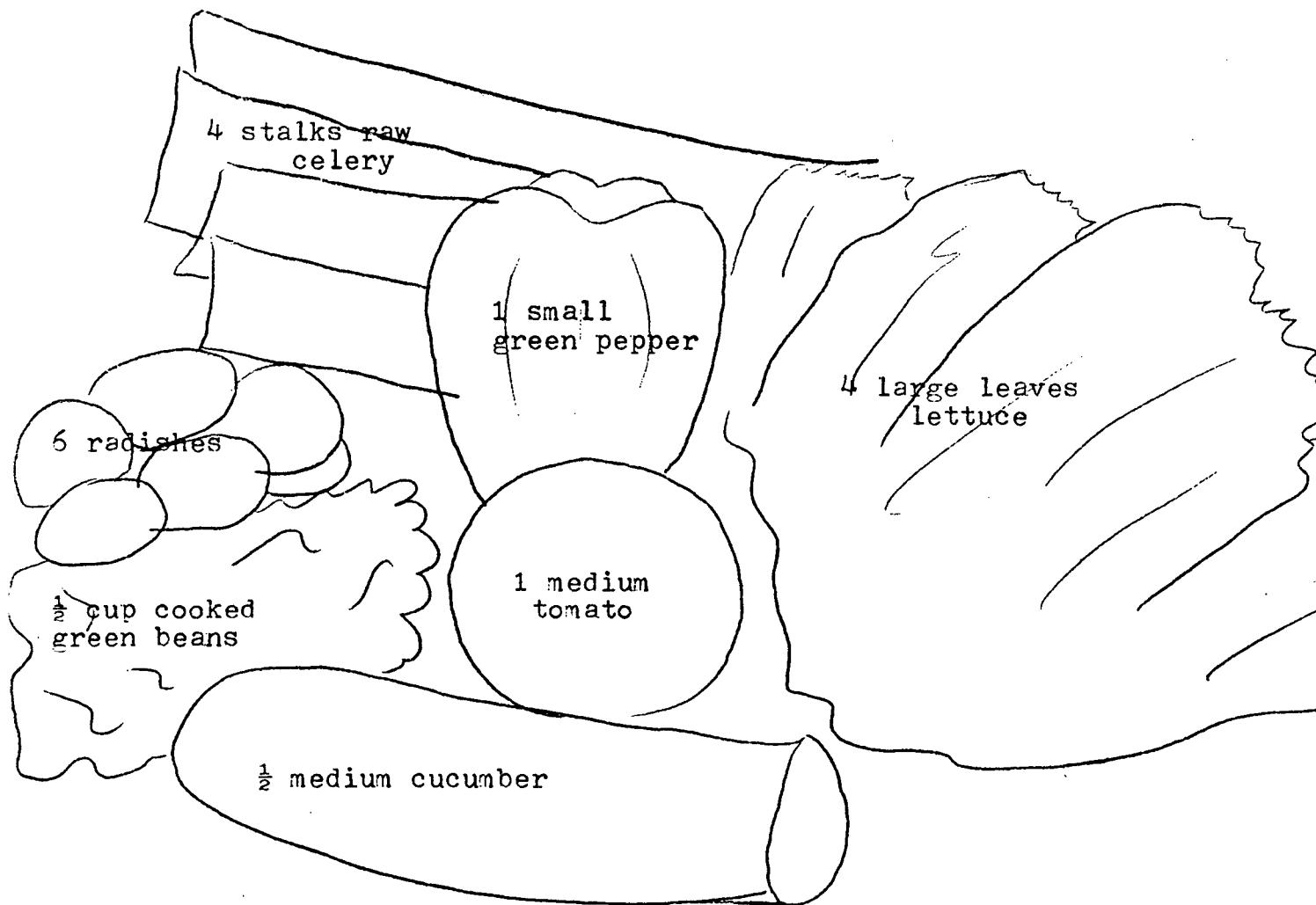




vegetable 'a'

Vegetable B Exchanges

REVIEW the vegetables shown in this picture with the patient. HELP him to locate each in his "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.



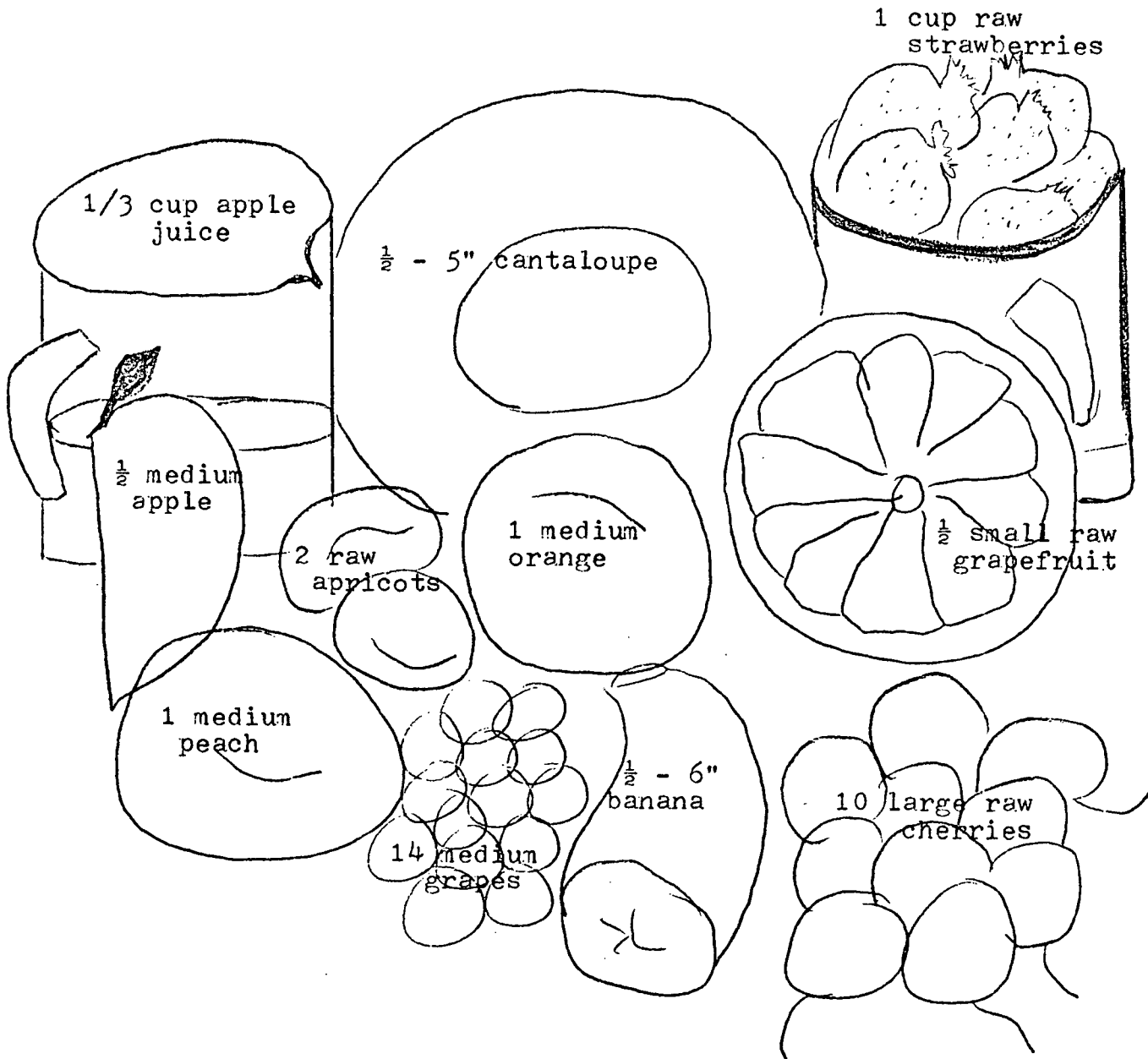
If you feel that it will not confuse the patient, explain to him that he may substitute 2 measured servings of "B" vegetables for one measured serving of "A" vegetables any time "A" vegetables are called for on his meal plan.

vegetable 'b'



Fruit Exchanges

REVIEW the fruits shown in this picture with the patient.
HELP him to locate each in his "Meal Planning" booklet.
EMPHASIZE that any of these fruits in the amount shown is
equal to one fruit exchange.

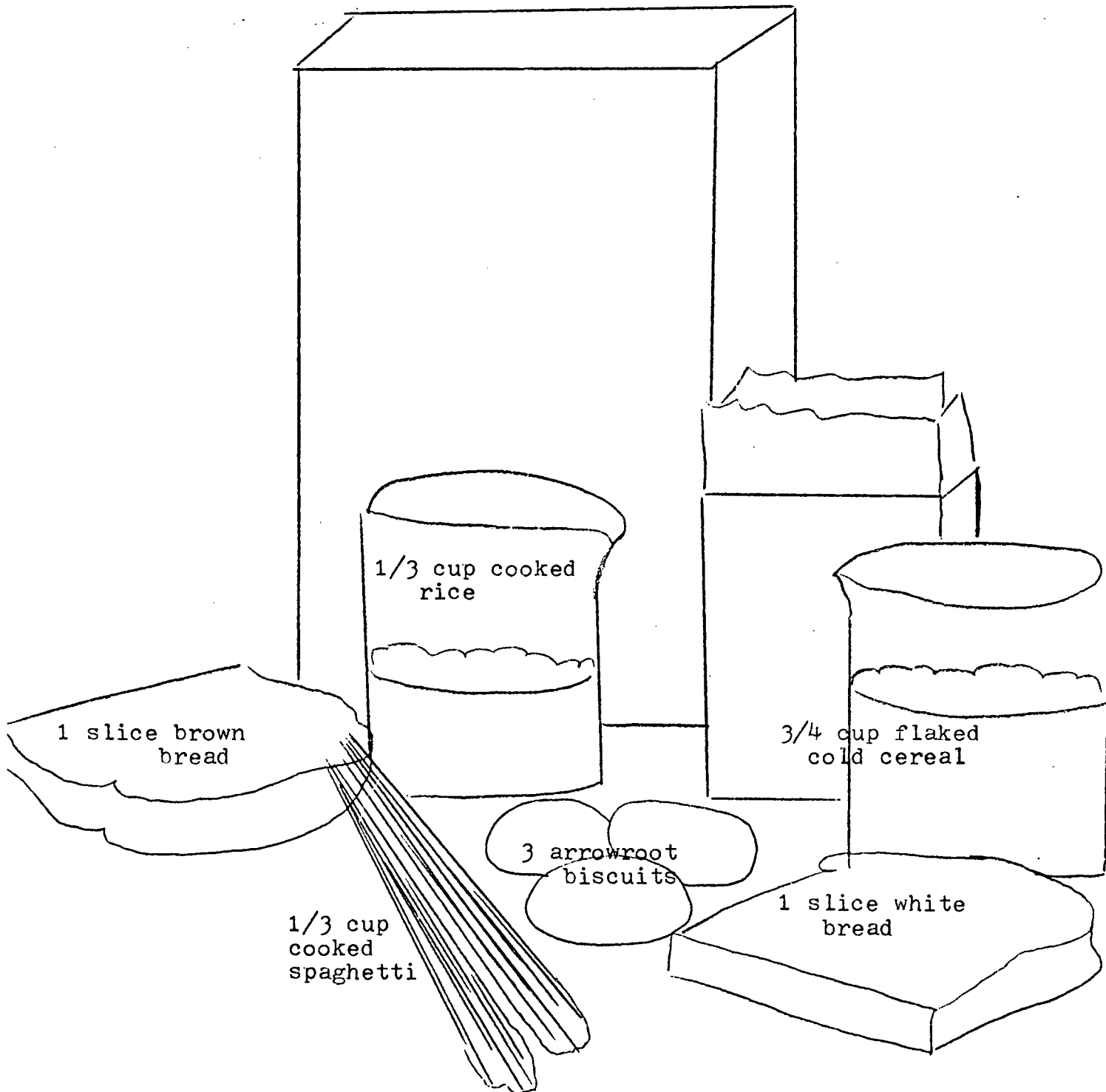


fruit



Bread Exchanges

REVIEW the bread exchanges shown in this picture with the patient. HELP him to locate each in his "Meal Planning" booklet. EMPHASIZE that any of these bread products in the amount shown is equal to one bread exchange.

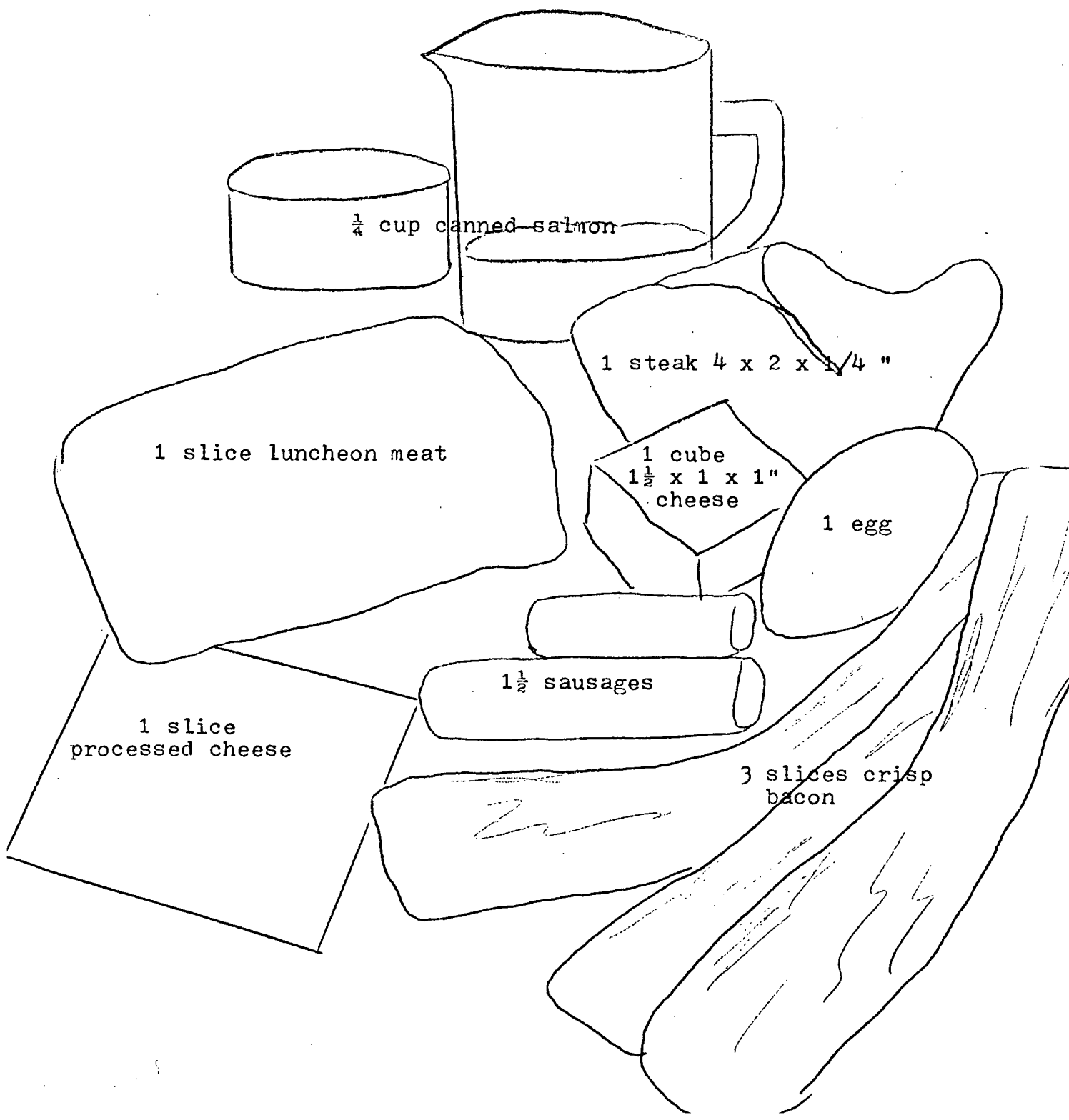




bread

Meat Exchanges

REVIEW the meats shown in this picture with the patient.
HELP him to locate each in his "Meal Planning" booklet.
EMPHASIZE that any of these meat products in the amount
shown is equal to one meat exchange.

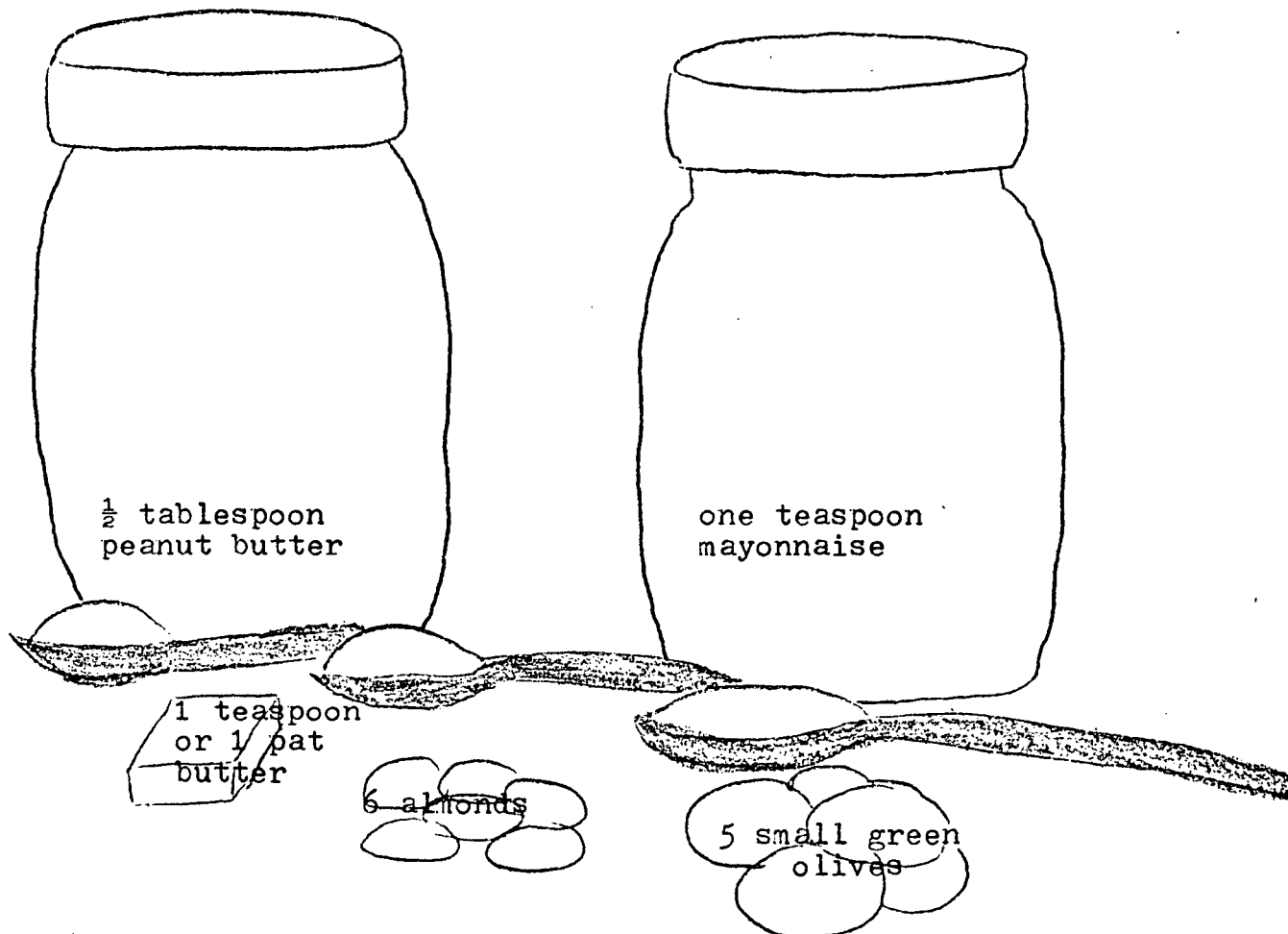




meat

Fat Exchanges

REVIEW the fat exchanges shown in this picture with the patient. HELP him to locate each in his "Meal Planning" booklet. EMPHASIZE that any of these fat products in the amount shown is equal to one fat exchange.



fat



**PEANUT
BUTTER**

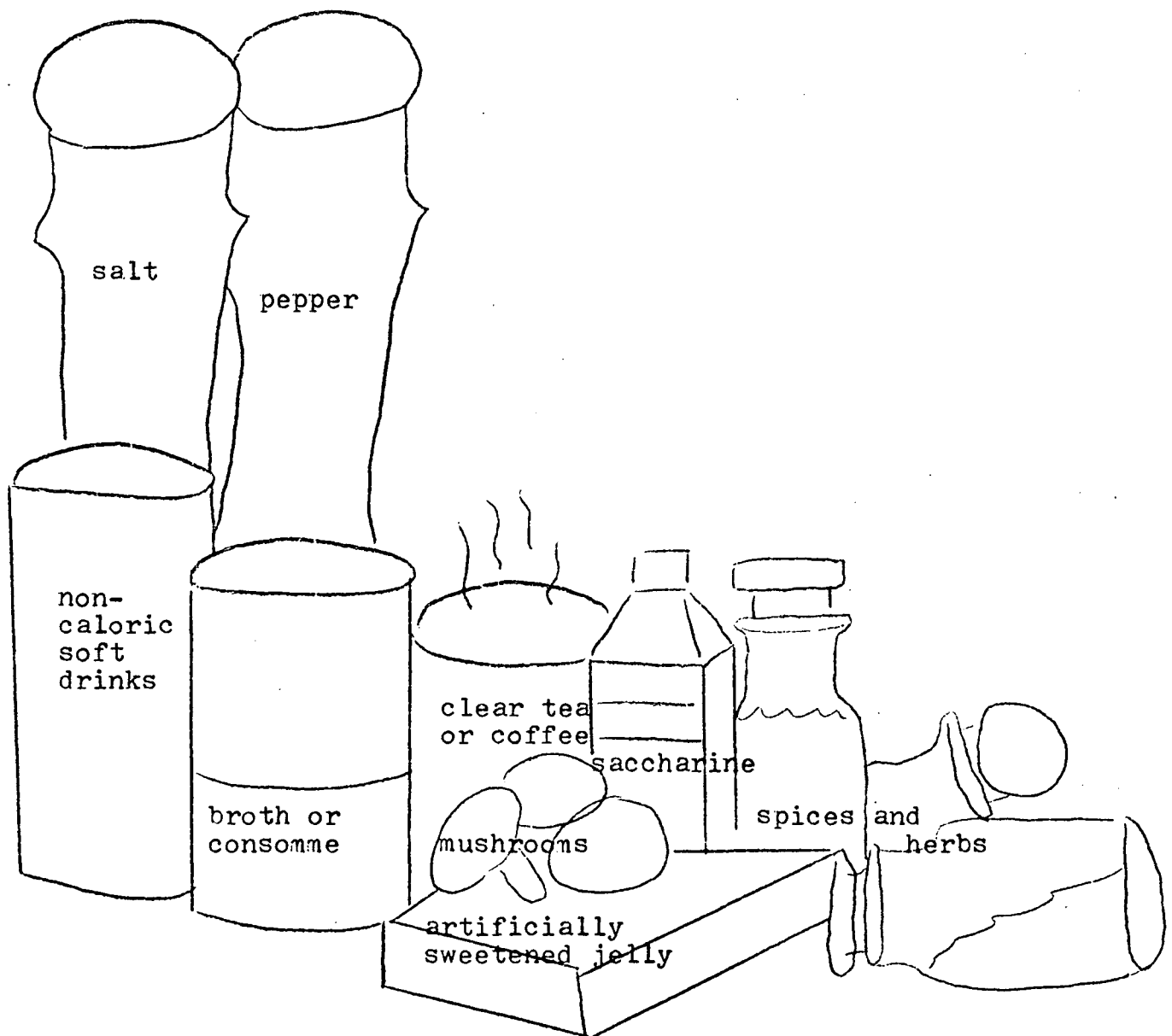


MAYONNAISE



Calorie Free Foods

REVIEW the foods shown in this picture with the patient.
HELP him to locate each in his "Meal Planning" booklet.
EMPHASIZE that any of these foods may be used as desired
to add zest to the diet.

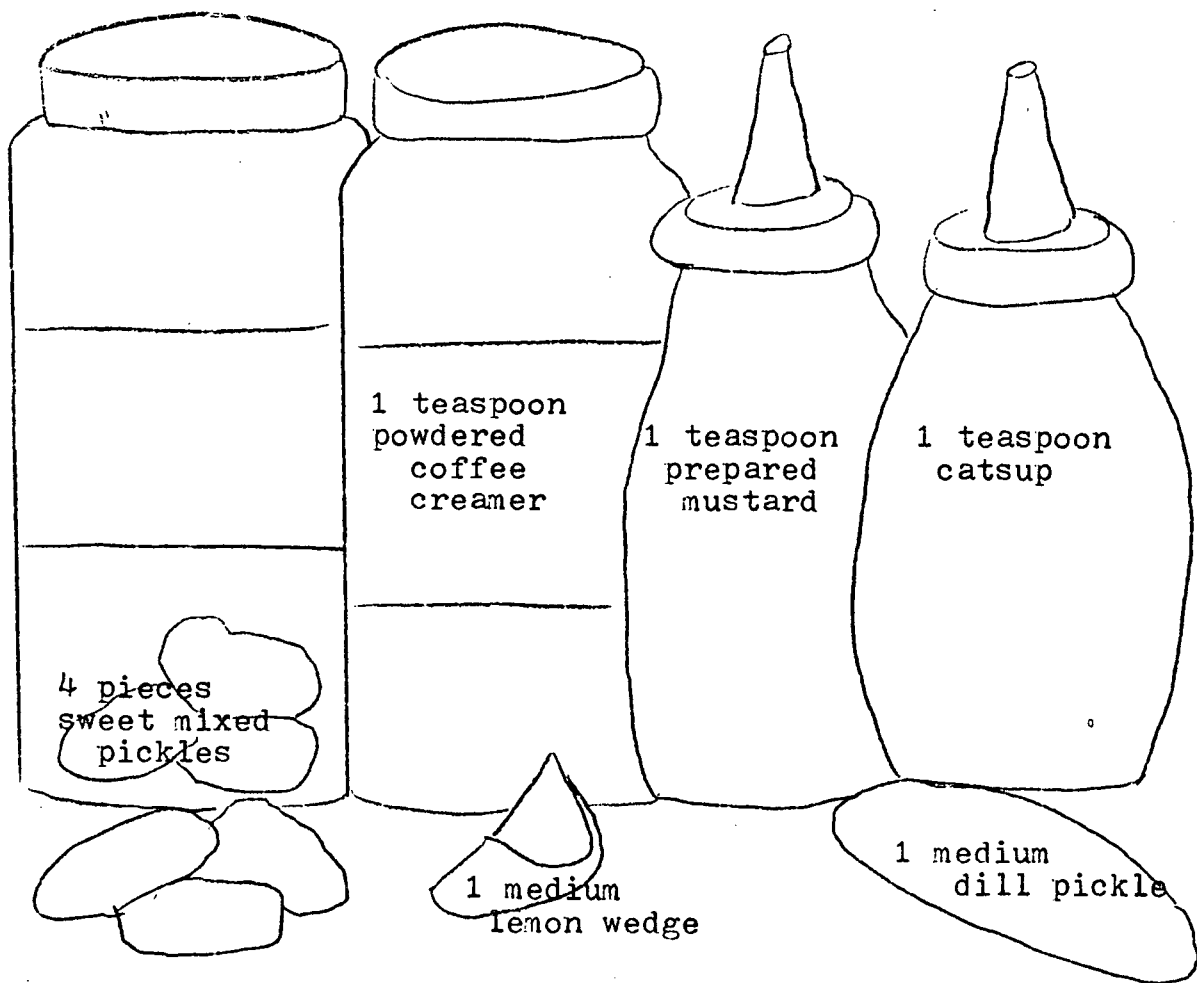


calorie free



Calorie Poor Foods

REVIEW the foods shown in this picture with the patient.
HELP him to locate each in his "Meal Planning" booklet.
EMPHASIZE that he may choose two measured servings of these
foods each day in addition to his diet.



calorie poor



There 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
candy	jam	cake	condensed
	jelly	cookies	milk
	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."

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

there aren't

many

foods

that

you

can't

have

SPICY HAMBURGERS
1 pound ground beef
1/2 teaspoon Tabasco
1 teaspoon tomato
1/2 cup tomato
or milk
Add Tabasco to tomato
juice or milk. Mix
the ground beef; sprinkle
with salt, mix
fork or hands. Shape into 4 large patties. Broil
broil or fry about 8 minutes on first side and 6 minutes
second side. Makes 4 servings.

SOUP ADDS FLAVOR TO "GROUND"
1/2 cup tomato
1/2 cup tomato
or milk
2 tablespoons margarine
or butter
1 can (1 1/4 cups)
condensed tomato
soup



TUNA CASSEROLE
Even tuna haters enjoy this easy recipe. You need
1 can (1 1/4 cups) condensed cream of mushroom
soup — 1/2 cup milk — 1 7-ounce can (1 cup) tuna,
drained and flaked; 1 1/4 cup crushed potato chips —
1 cup UNSALTED drained cooked peas.
Empty mix well. Add tuna, 1 cup potato chips and peas
to the soup. Add tuna, 1 cup potato chips and peas
of chips. Bake at 350 degrees. Sprinkle top with rest
should be 4 helpings.



**MUSHROOM TURKEY
STROGANOFF**
1 cup sliced fresh mushrooms
1 teaspoon celery salt
1/3 cup ricotta cheese
1/2 tablespoon dehydrated onion
flakes
1 teaspoon lemon juice
2 ounces cooked white
diced

RATATOUILLE
(Turkey)
1 1/2 cups thick
(3 cups)
2 tablespoons
flakes
1 clove garlic, minced
1 tablespoon cheese
1 bay leaf
2 ounces cooked white
turkey, diced
2 ounces cooked diced
diced zucchini



Questions re Diet

DISCUSS any of the following information which is of concern to the patient:

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 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. 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

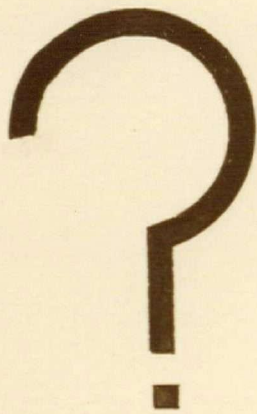
If you are nauseated or vomiting, or if you have diarrhea or a poor appetite, you may not feel like eating your regular diet. If any of these things happen, you should phone your doctor. He may suggest that you convert your meal plan into fluid exchanges. If he does, turn to pages 20 and 21 of your "Meal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



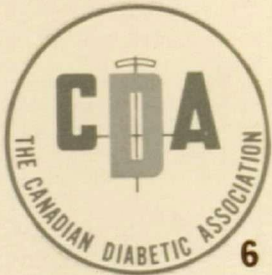
1



2



3



6



4



5

Medicine

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

medicine

Antidiabetic 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 the patient to locate his antidiabetic pill among those illustrated on the poster. Then choose the information which applies to him from that given below. DO NOT give the patient information about drugs other than his own.

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 then 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.)"

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

BE SURE that the 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



ORINASE



MOBENAL



DBI - TD



GENAREX

antidiabetic pills



CHLORONASE - 100



CHLORONASE - 250



DIMELOR



DIA - BETA



DBI



DIABINESE

Insulins

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 the patient to locate his insulin among those illustrated on the poster. Then choose 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 syringeful). 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.

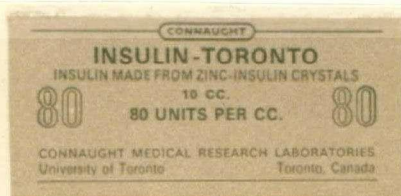
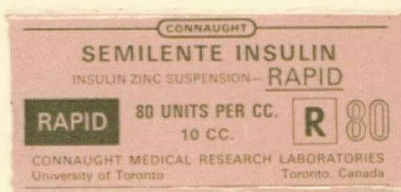
EXPLAIN:

"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."

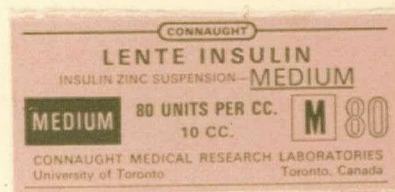
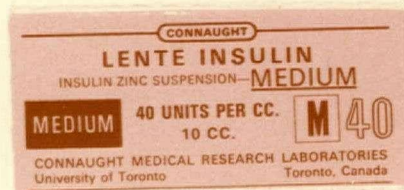
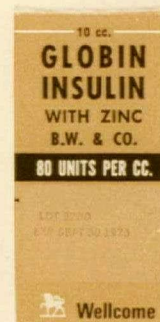
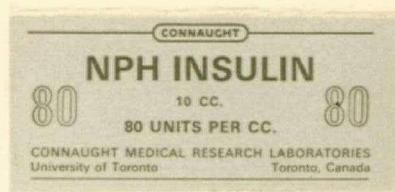
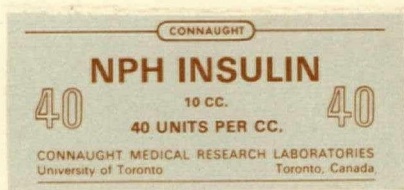
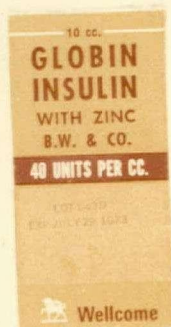
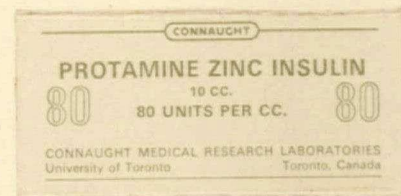
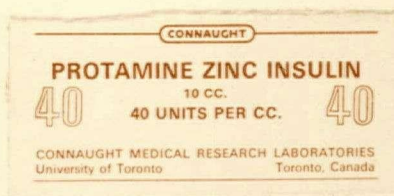
GIVE the patient the sheet titled "Insulins" for his Take-home folder.

BE SURE that the 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 him to fill in this information on the sheet provided.

DO NOT give this information to antidiabetic pill users.

**RAPID (fast)****ACTING**

insulins

**MEDIUM ACTING****PROLONGED (slow)****ACTING**

Equipment

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.

4. Alcohol:

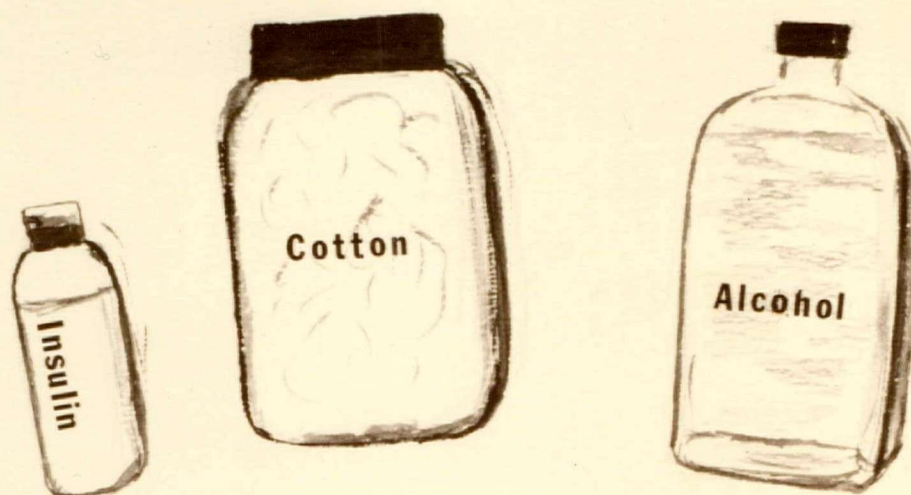
You will need alcohol for cleaning your skin and some of your injecting equipment. You should buy 70% isopropyl alcohol for this purpose. Store your alcohol in a covered glass container, as it evaporates very quickly if left uncovered.

5. Cotton:

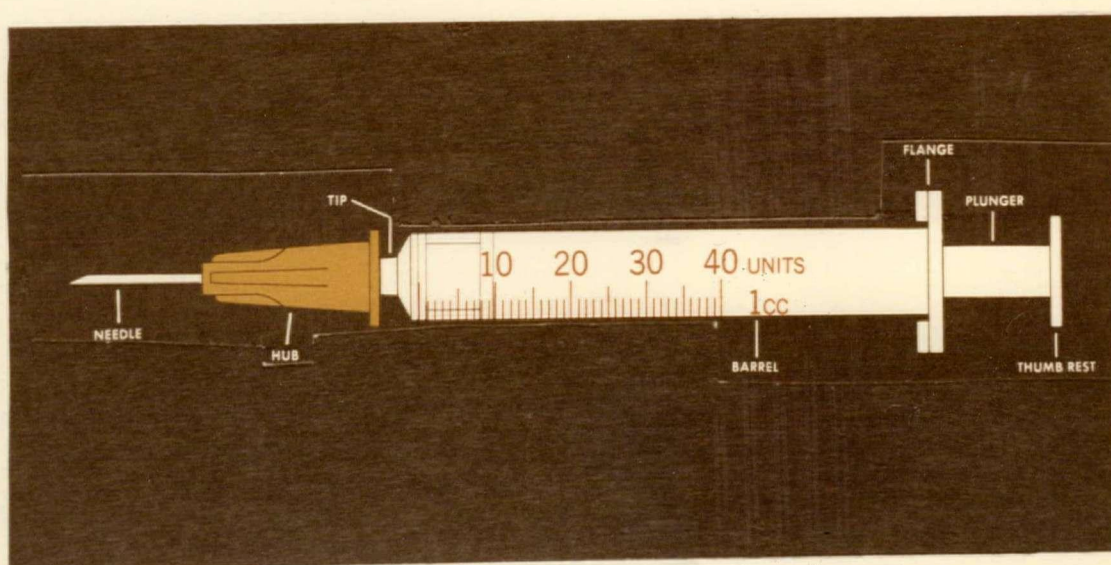
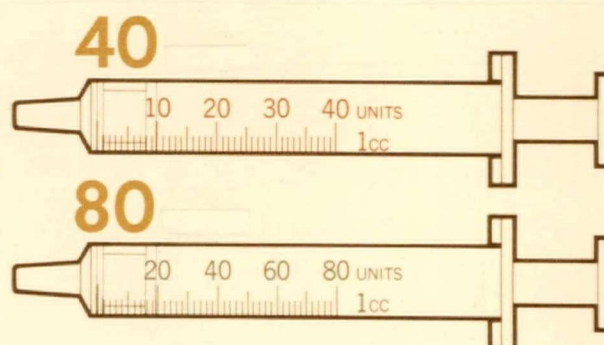
Absorbent cotton will be needed to apply the alcohol to your skin. Either bulk cotton or cotton balls will serve this purpose well. Store your cotton in a clean covered container."

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

GIVE the patient the sheet titled "Equipment" for his Take-home folder. ASSIST him 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".



equipment



Preparing 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.
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 patient, using his own insulin (and syringe if possible). Encourage him to participate in identifying each step as you are doing it. REPEAT this demonstration as often as necessary to be assured that the patient understands the procedure.

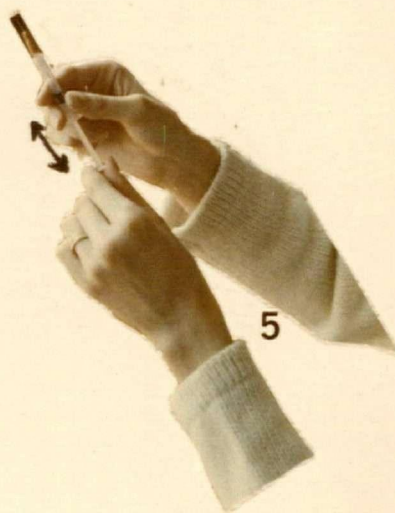
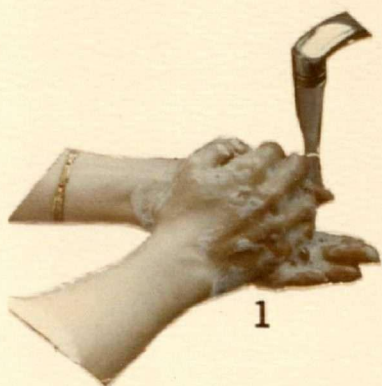
HAVE THE PATIENT RETURN THE DEMONSTRATION. Encourage him to identify each step as he does it. Have him REPEAT the procedure until you are satisfied that he can perform it accurately and safely (i.e. without contamination).

LEAVE the injection equipment with the patient so that he may continue to practice the procedure.

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

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

preparing your Insulin



Giving 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 patient as you are giving his morning injection. Then, DEMONSTRATE the procedure to the patient using an orange or a sponge for the injection site. Encourage the patient to identify each step as you are doing it. REPEAT this demonstration as often as necessary to be assured that the patient understands the procedure.

HAVE THE PATIENT RETURN THE DEMONSTRATION, identifying the steps as he does so, often enough that you are convinced he can perform the procedure safely and accurately.

LEAVE the injection equipment with the patient so that he may continue to practice the procedure. GIVE the sheet titled "Giving Your Insulin" for his Take-home folder.

ENCOURAGE the patient to begin giving his own injection as soon as possible. Once he has mastered this procedure, he should give his own injection every day to REINFORCE this learning.

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

Once the patient has mastered the injection technique, 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!"



1



2



3



4



5



6

giving your Insulin

Care 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. Squirrt it out. Repeat 2 or 3 times.

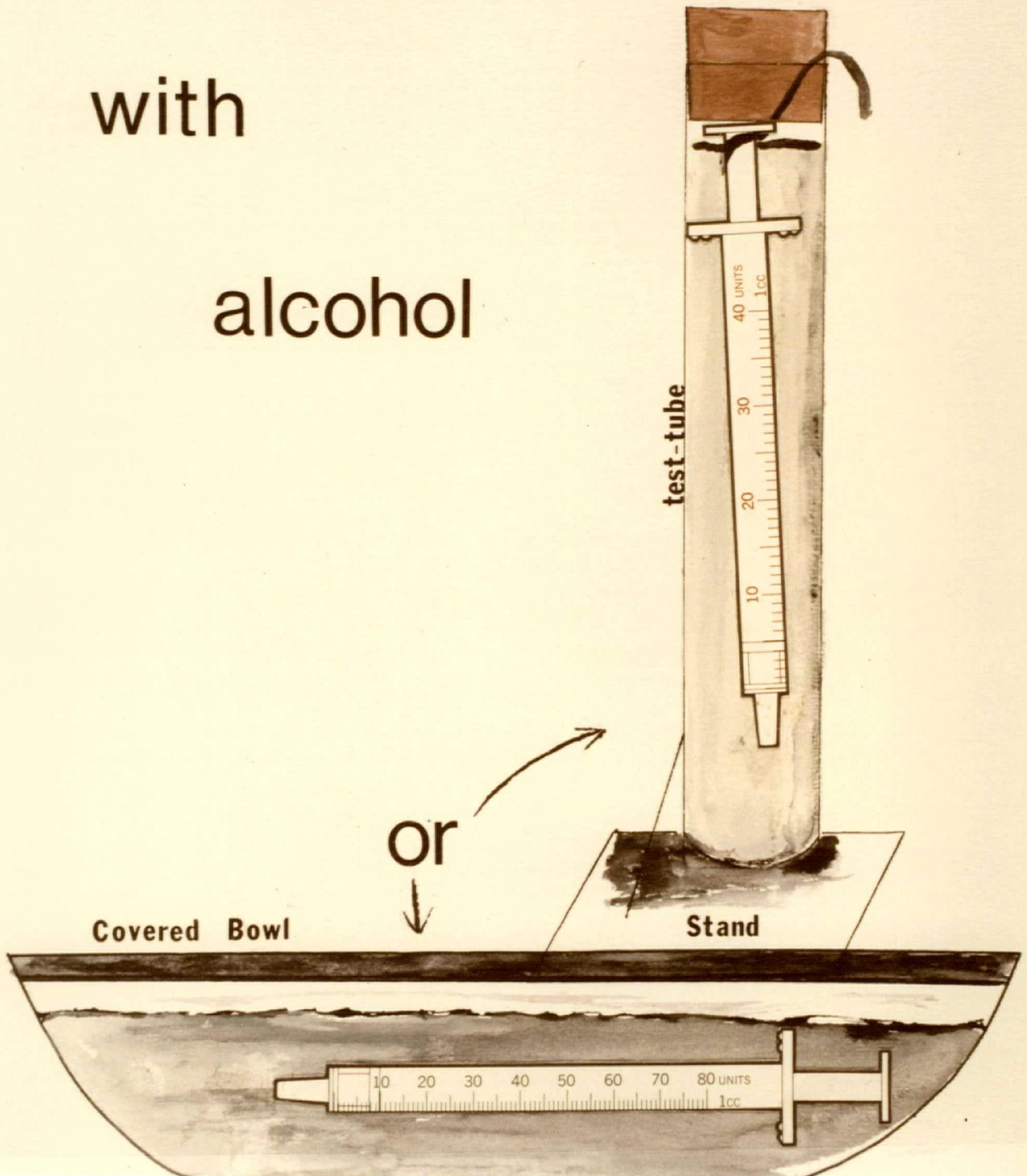
(c) Put your syringe into the container. It should be covered with alcohol. Place the lid on the container.

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

care
of your equipment ...
daily care
with
alcohol



Weekly 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:

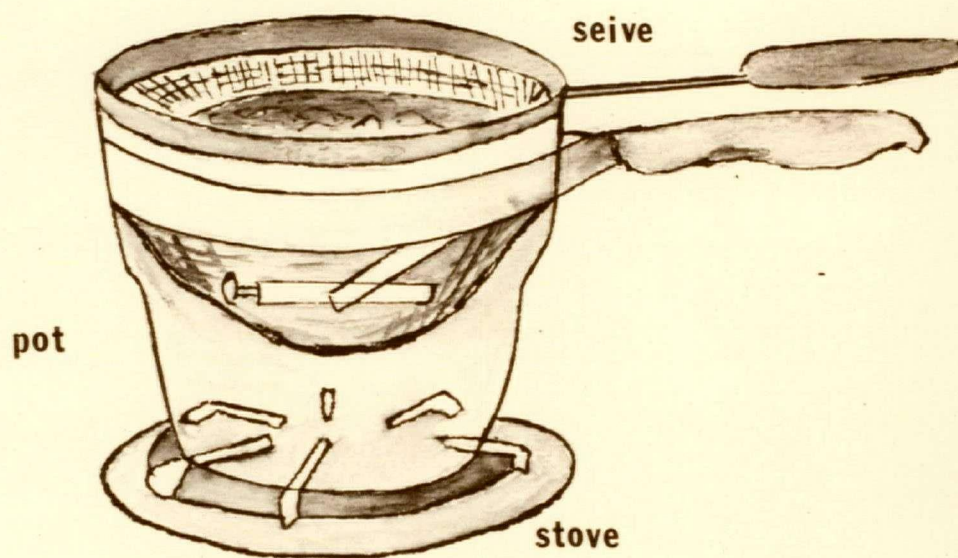
- i. Pick up the outside part of the syringe (the "barrel") with one hand.
- ii. With the other hand grasp the handle end of the plunger.
- iii. Without touching any other part, slide the plunger into the barrel to put the syringe together.

(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!)"

weekly care



boil in water

exercise
AND
hygiene

Exercise

EXPLAIN:

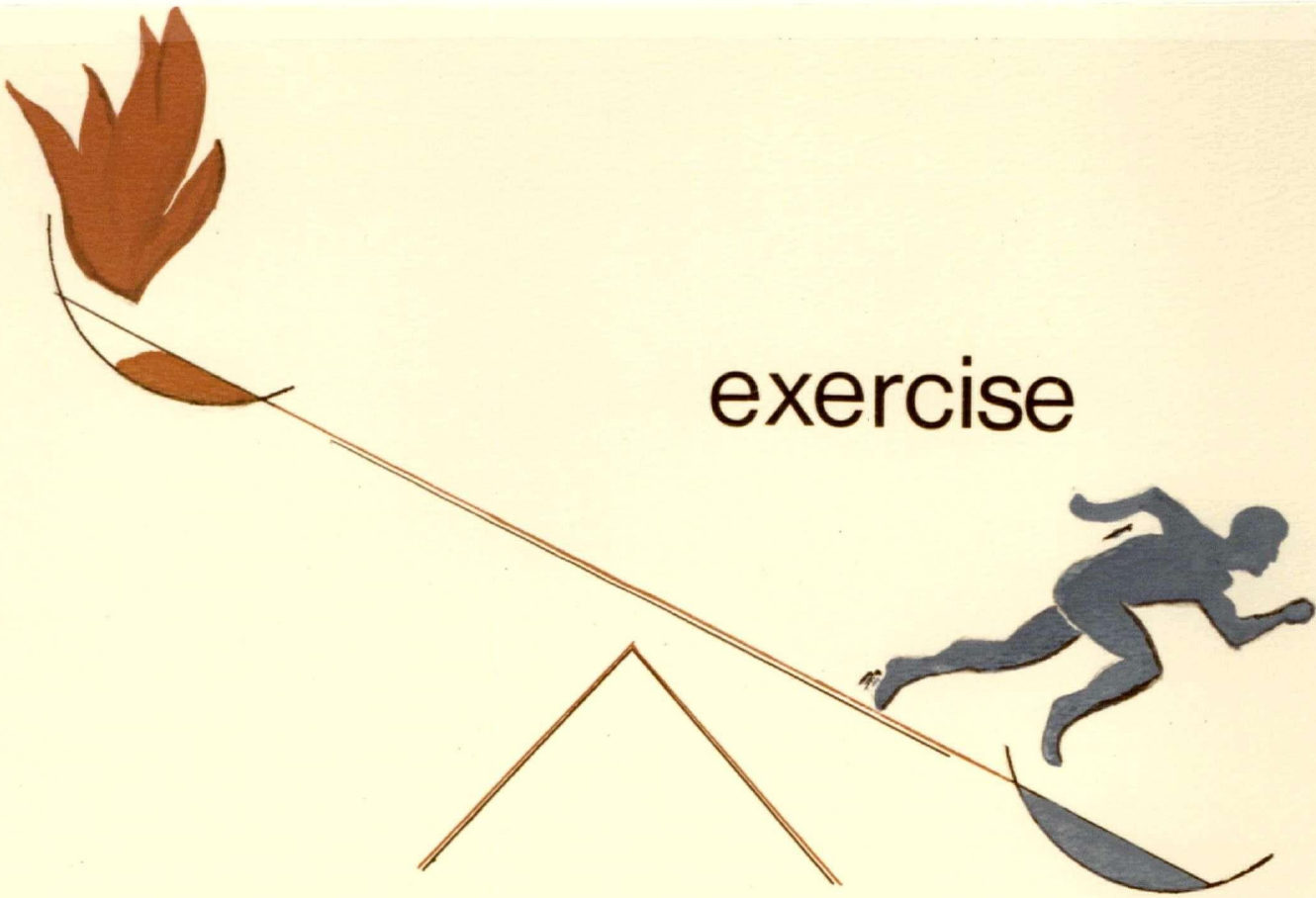
"Exercise is good for everyone. It helps keep weight down, muscles strong and blood flowing properly. In short - it helps people stay healthy. This is especially true for diabetics.

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



same amount

everyday

weekday

weekend

Personal Hygiene

EXPLAIN:

"In managing your diabetes, personal hygiene is very important. The illustrations on the poster 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.

(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.

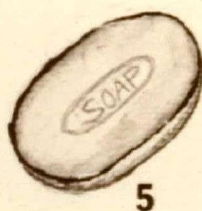
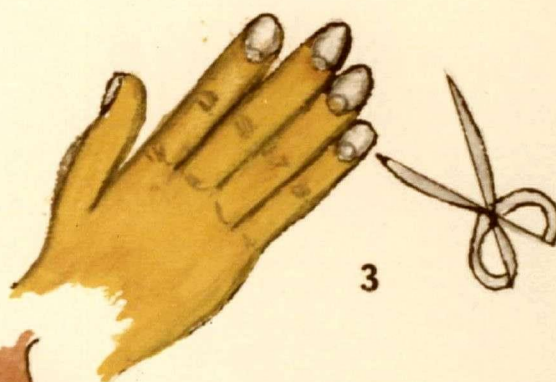
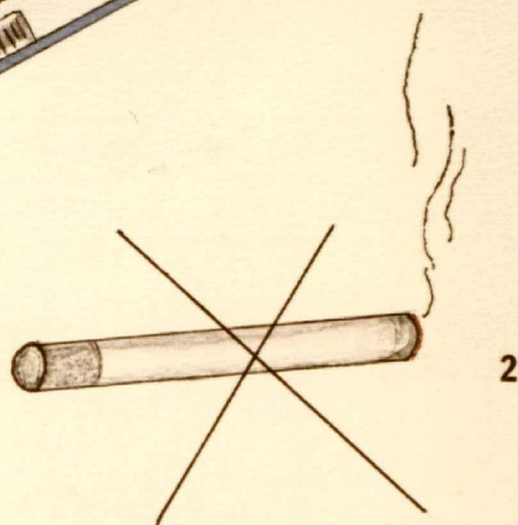
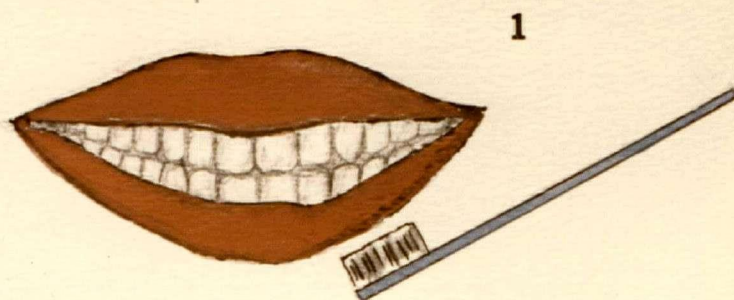
5. General Cleanliness:

Keep your skin and hair clean with regular bathing. Use lukewarm (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 the patient the sheet titled "Personal Hygiene" for his Take-home folder.

personal
hygiene



Urine 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 $\frac{1}{2}$ 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 $\frac{1}{2}$ 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."

urine
testing

Urine 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:

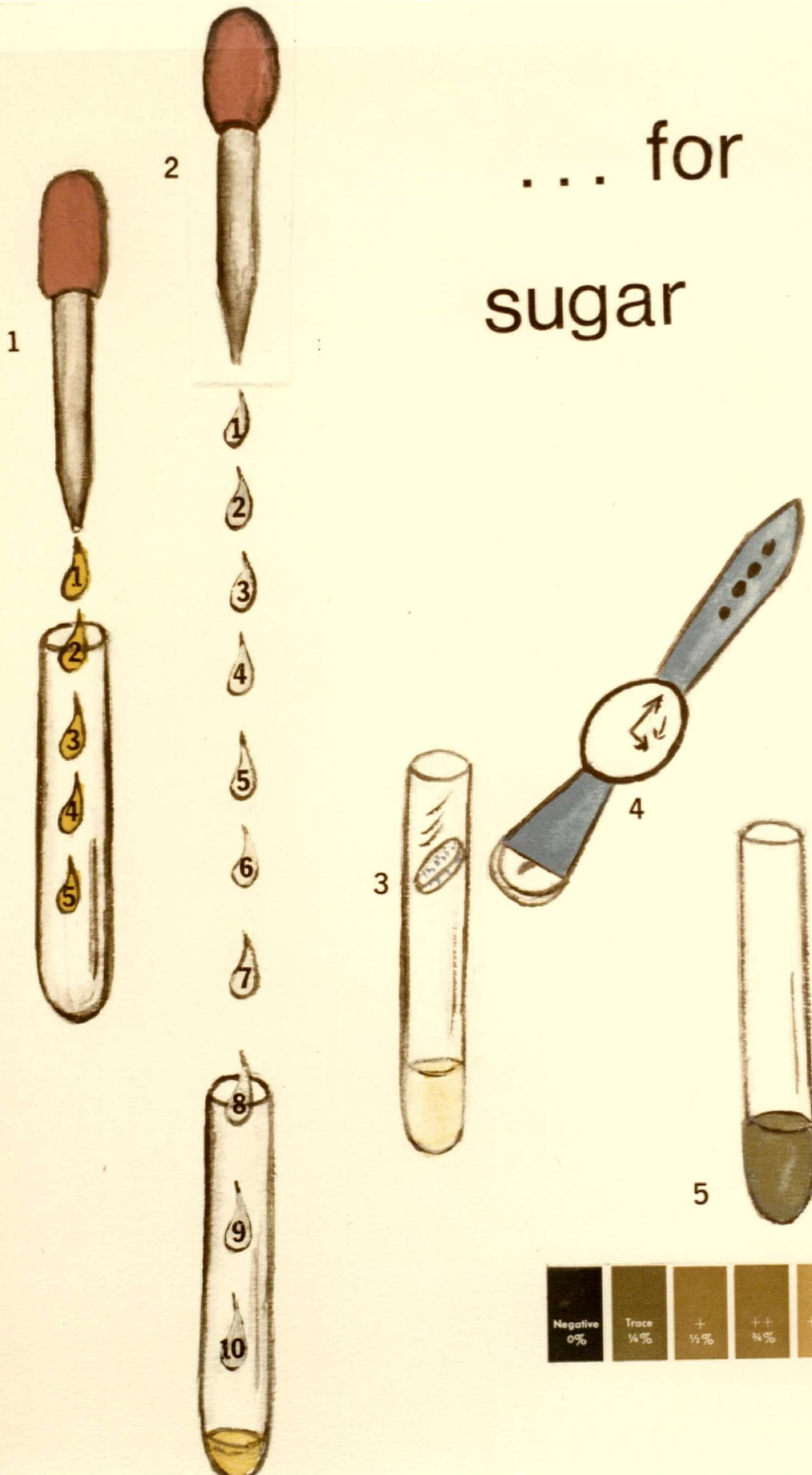
1. Collect your urine in a clean container. With the dropper in an upright position place 5 drops of urine in the test tube.
2. Rinse the dropper and add 10 drops of water.
3. Drop one Clinitest tablet into the test tube (be careful not to touch it with damp fingers). Watch while the complete reaction 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 patient using his own urine. Encourage him to participate in identifying each step as you are doing it. REPEAT this demonstration as often as necessary to be assured that the patient understands the procedure.

HAVE THE PATIENT RETURN THE DEMONSTRATION, identifying the steps as he does so, often enough that you are convinced he can perform the procedure safely and accurately.

... for
sugar



Negative 0%	Trace 1/4%	+	++	+++	++++
	1/4%	1/2%	3/4%	1%	2%

Urine 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 patient using his own urine. Encourage him to participate in identifying each step as you are doing it. REPEAT this demonstration as often as necessary to be assured that the patient understands the procedure.

HAVE THE PATIENT RETURN THE DEMONSTRATION, identifying the steps as he does so, often enough that you are convinced he can perform the procedure safely and accurately.

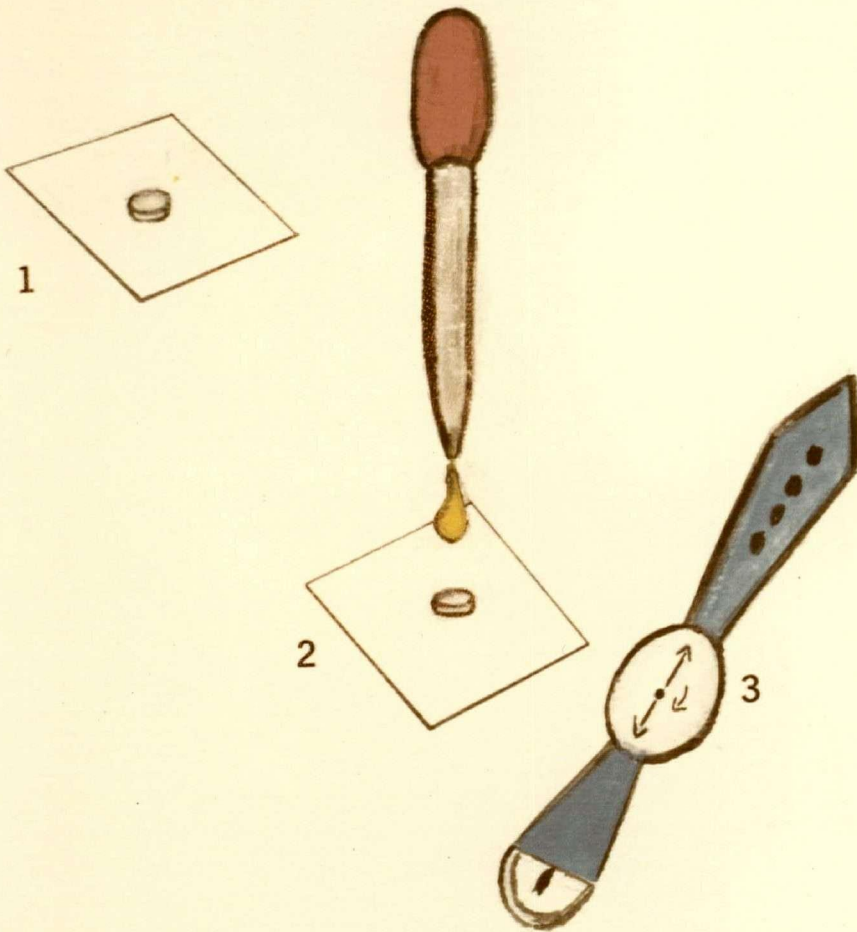
ENCOURAGE the patient to begin doing all of his own urine tests as soon as possible. He may need supervision at first, but once he has mastered the procedure, he should be able to take the responsibility for testing and reporting the results on his own.

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

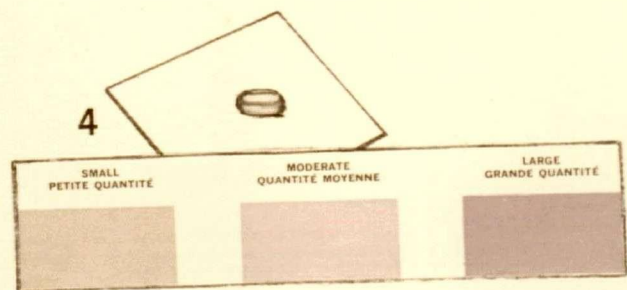
EXPLAIN:

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.

and



acetone



SMALL PETITE QUANTITÉ	MODERATE QUANTITÉ MOYENNE	LARGE GRANDE QUANTITÉ

Keep 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."

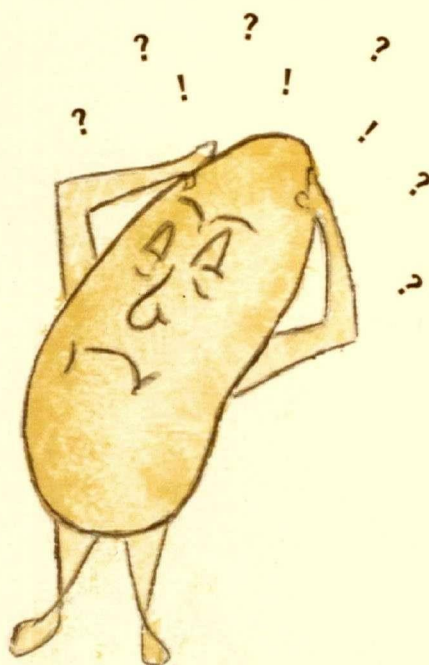
REVIEW the sample record with the patient. Be sure he understands what and how to record in each column.

Problems

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."



problems

Diabetic Coma

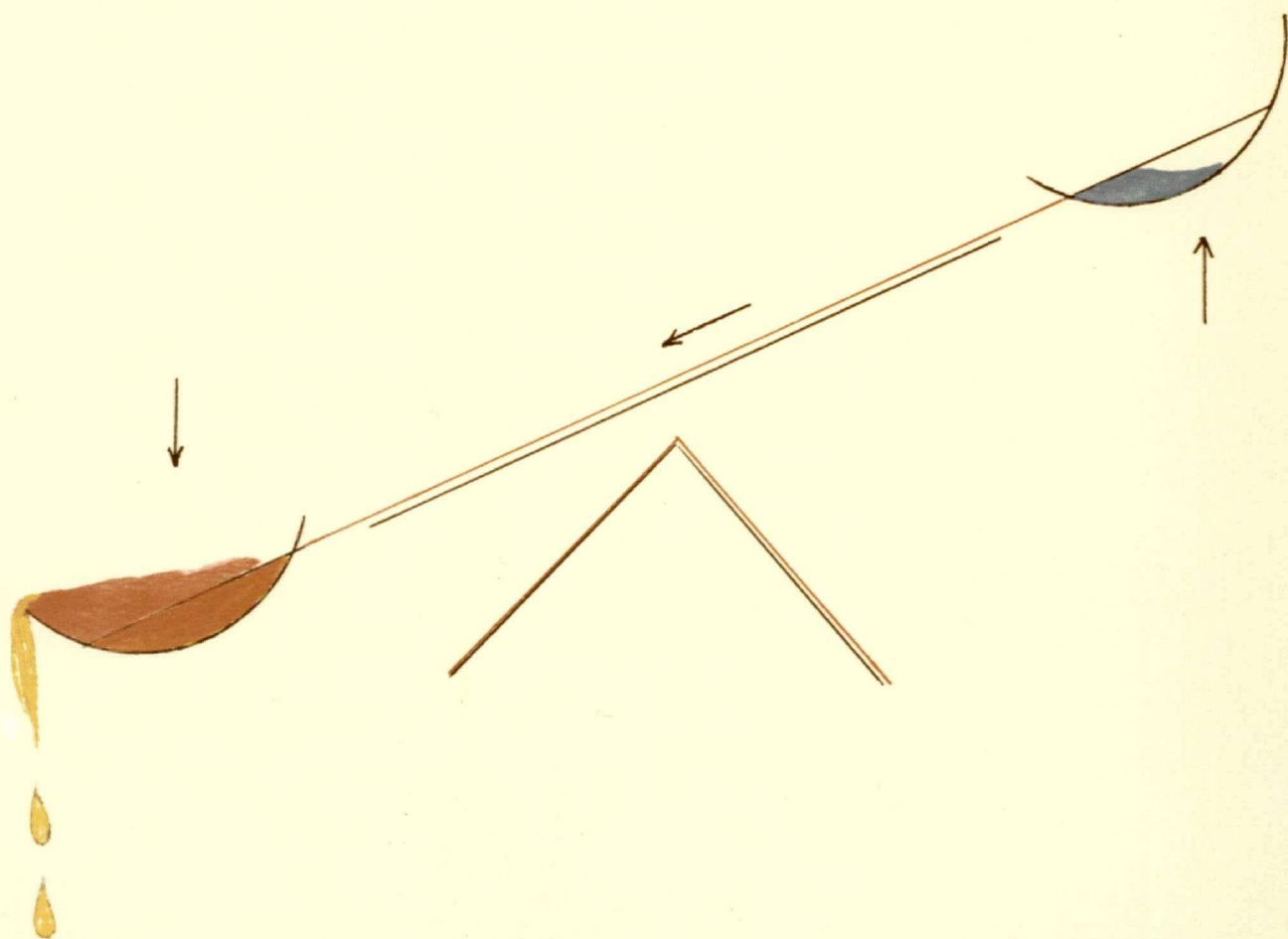
EXPLAIN:

"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."

diabetic coma



Symptoms (of Diabetic Coma)

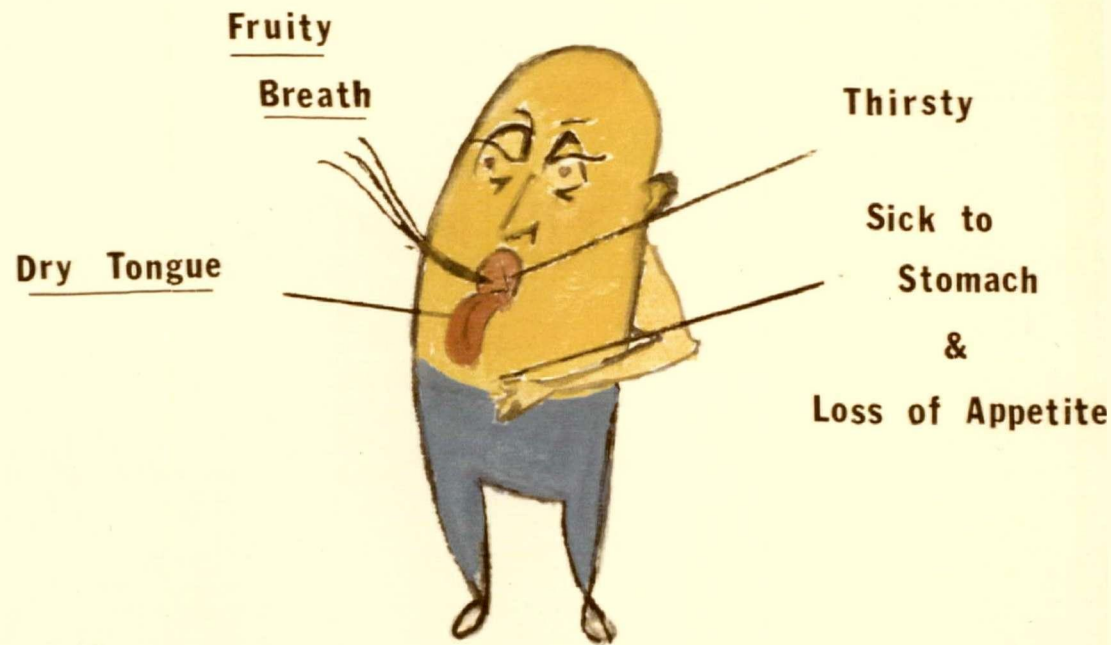
EXPLAIN:

"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."

symptoms

OF DIABETIC COMA



What To Do (for Diabetic Coma)

EXPLAIN:

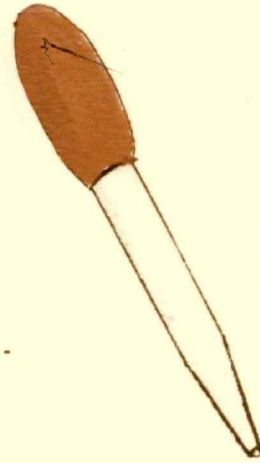
"Here's what to do if you feel you might be going into a diabetic coma:

- (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.

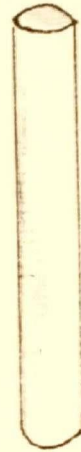
How can you keep from having a diabetic coma? Here are some useful suggestions:

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



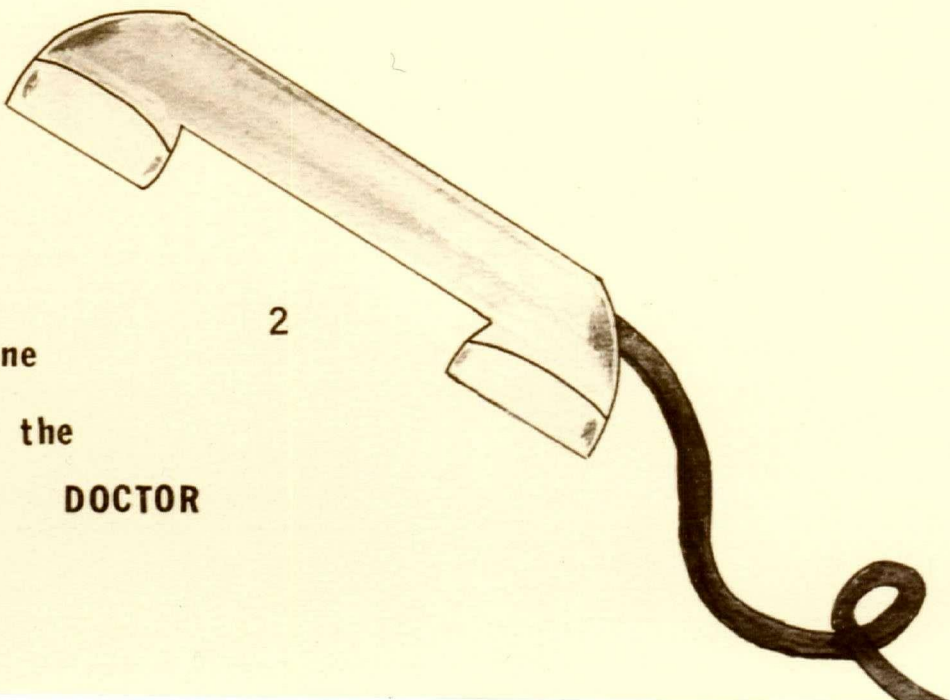
1



TEST
your
urine

what to do

FOR DIABETIC COMA



2

phone
the
DOCTOR

Insulin Shock

EXPLAIN:

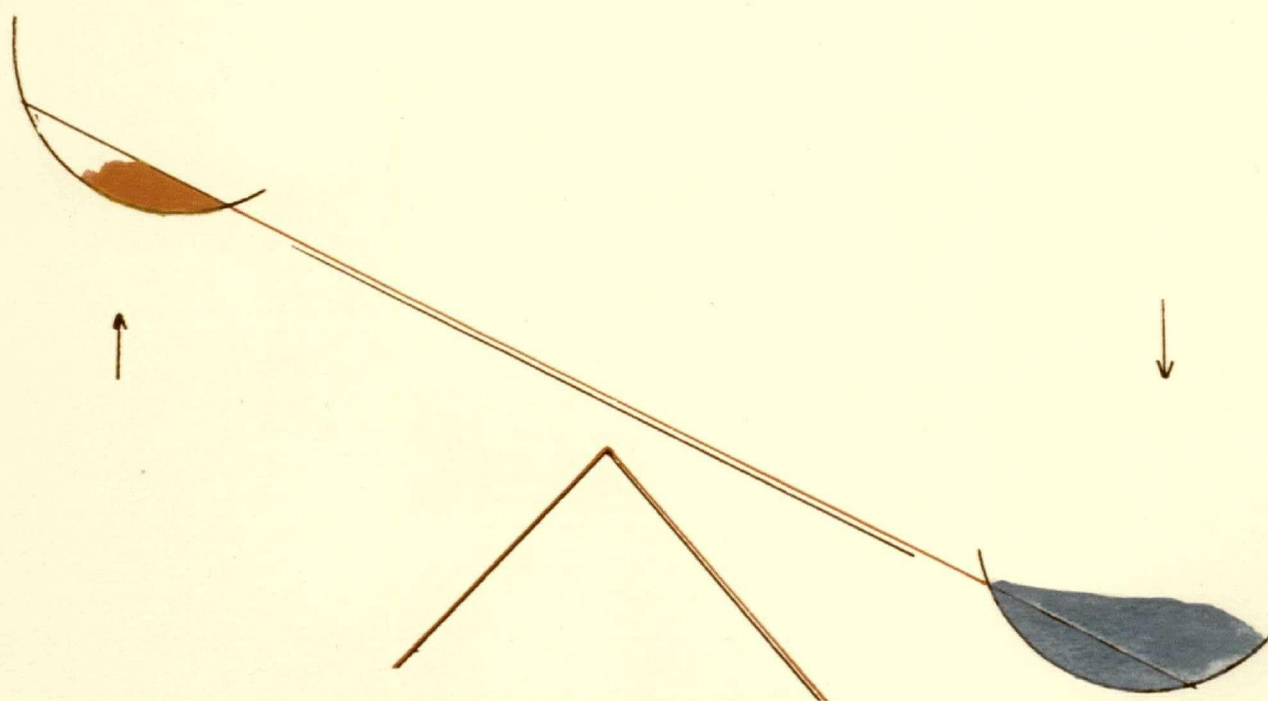
"Insulin reaction is the problem which results when your sugar-insulin balance is tipped to the insulin side. That is, you have either too much insulin or not enough sugar in your blood. Other names for insulin shock are "insulin reaction" and "hypoglycemia" (meaning not enough blood sugar).

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."

insulin shock



Symptoms (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."

symptoms

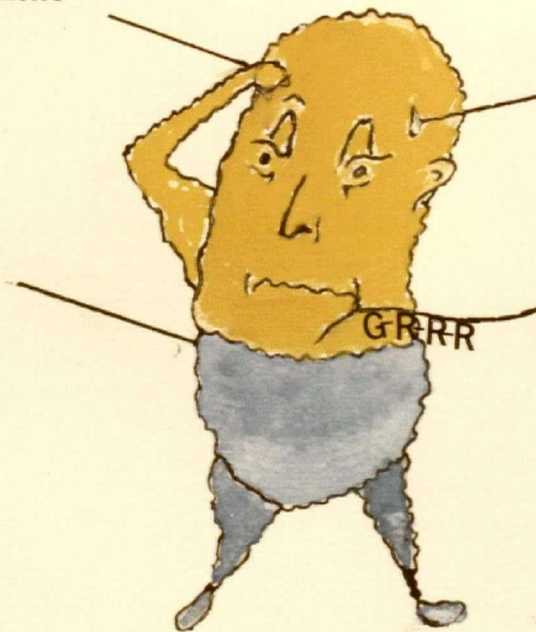
OF INSULIN SHOCK

Headache
& / or
Feeling Faint

Nervous
or
Trembling

Sweating

Hungry



What 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.

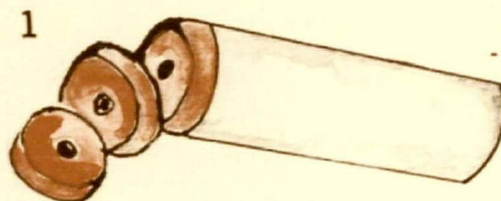
How can you keep from having insulin reactions? Follow these suggestions:

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



Eat or Drink
something



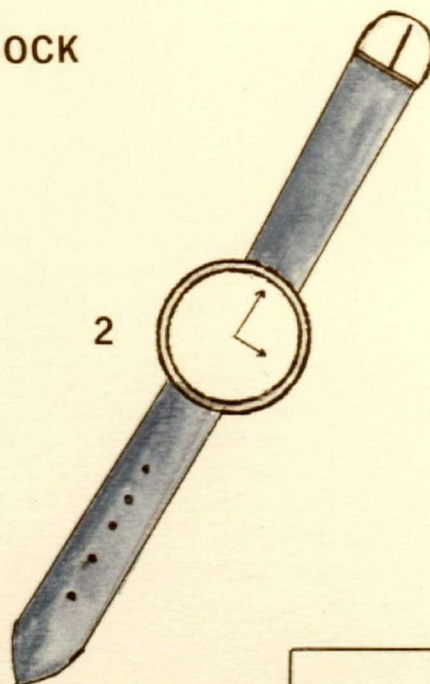
1

what to do

FOR INSULIN SHOCK

Wait 15
Minutes

2



— THEN —

IF YOU DON'T FEEL BETTER

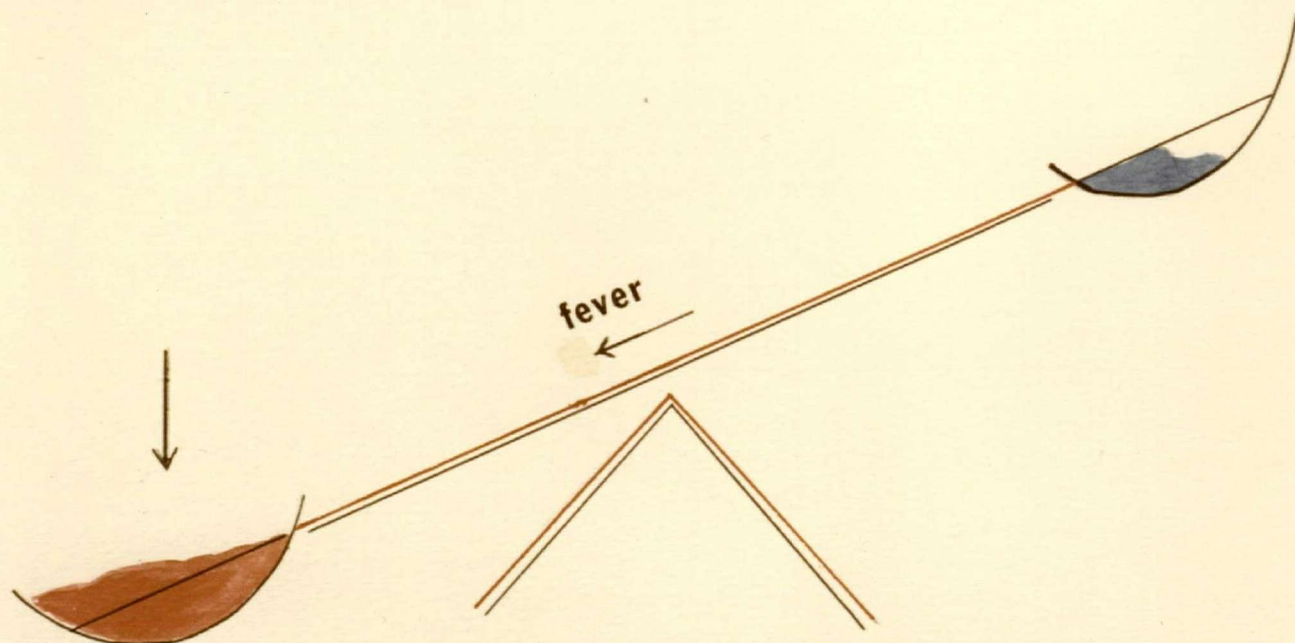
Eat or Drink some more
and Call the Doctor

Infection

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."

infection



What 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."

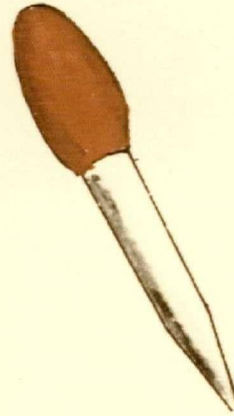
GIVE the patient the sheet titled "Infection" for his Take-home folder.

what to do

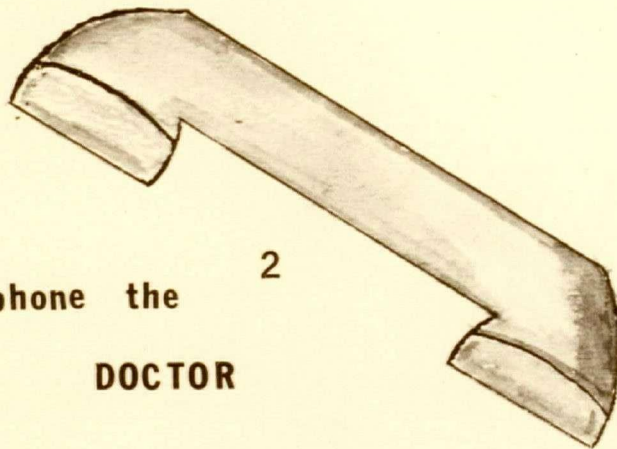
FOR INFECTION

TEST your

urine

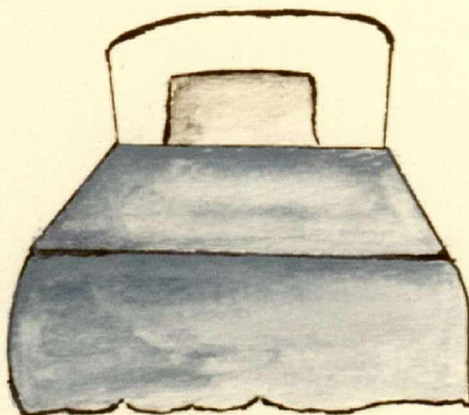


1



phone the
DOCTOR

2



3

go to bed

Protect Yourself

EXPLAIN:

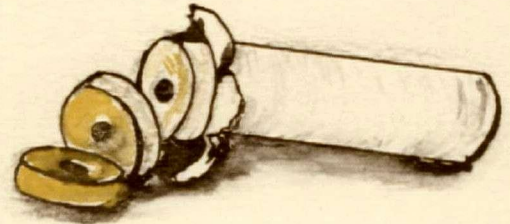
"There are two very simple things you should do to protect yourself:

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."



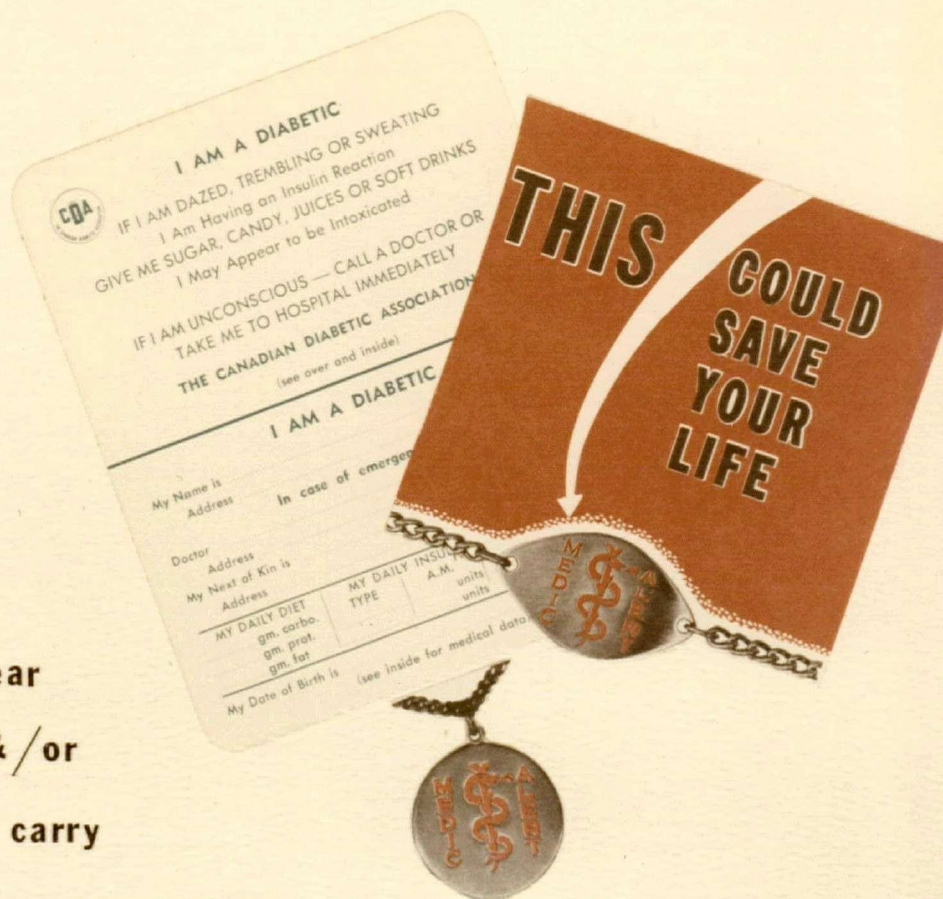
protect

yourself !

carry

something

sweet



wear

& / or

carry

IDENTIFICATION

Where to Get Help

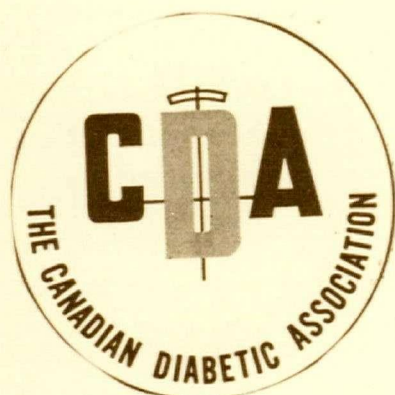
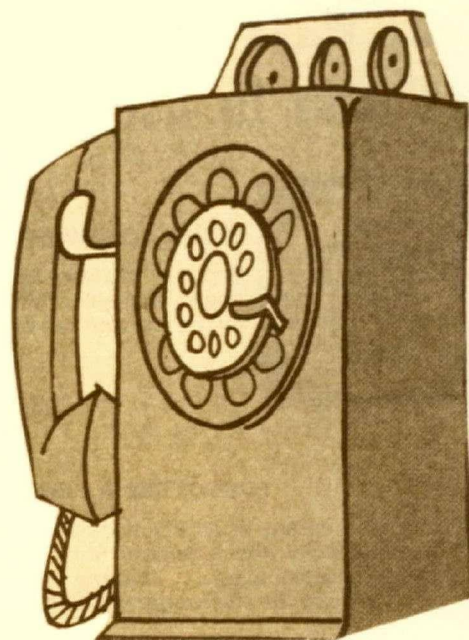
EXPLAIN:

"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>	<ol style="list-style-type: none"> 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. Services. 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. Education. 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. "The Newsletter". The C.D.A. publication "The Newsletter" is mailed to all members four times a year. Information and price on other publications on diabetes are available from the national office. 4. Encouragement. 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.

continued next page...

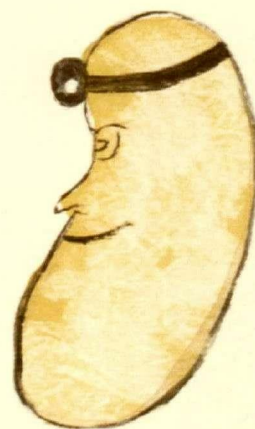
Dial-a-Dietitian



where
to get
help



PUBLIC HEALTH
and V.O.N.
NURSES



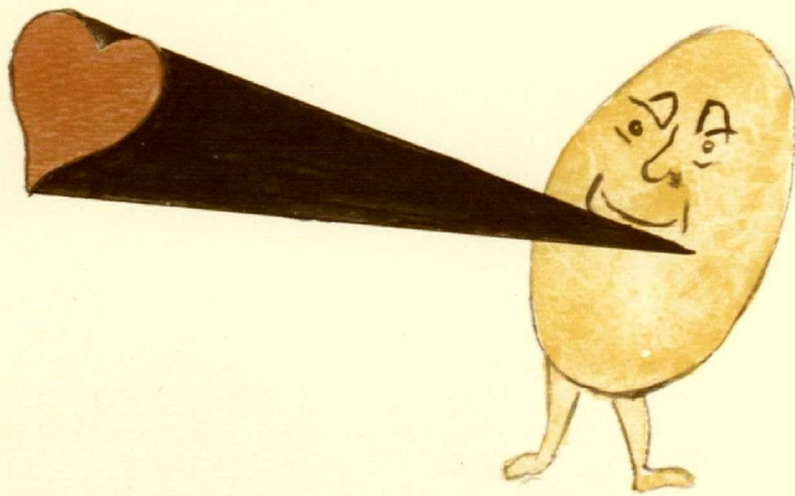
YOUR DOCTOR

(Nurse's Instructions)

SOURCE	WHAT THEY CAN DO FOR YOU
3. Public Health <u>or</u> Victorian Order of Nurses visiting nurses. <hr/> (phone numbers)	1. Do home teaching. 2. Give insulin injections at home. 3. Help with your food care if you can't manage it alone.
4. Dial-a-Dietician <hr/> (phone number)	<p>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:</p> <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 the patient the sheet titled "Where to Get Help" for his Take-home folder.

your body responds to
loving care ...



treat it that way !

PHOTOGRAPH OF THE CARRYING CASE SECTION ^a
OF THE DIABETIC TEACHING TOOL



- a. Contents of the carrying case are found
on pages 246 to 289, following.

DIABETIC TEACHING

<u>Topic</u>	<u>Date</u>	<u>Nurse's</u>
	<u>Completed</u>	<u>Initials</u>
1. Introduction		
2. Diet		
3. Medicine		
4. Exercise and Hygiene		
5. Urine Testing		
6. Problems		

(Addressograph Stamp)

Comments: -

DIABETIC SUPPLIES

(Name) _____

You will need the supplies
checked below which can be
purchased at your drugstore.

Food Scale	
Official hypodermic syringe	
cc units	
cc units	
Hypodermic needles	
gauge inch	
Syringe sterilizing tube	
Sterile cotton	
Isopropyl alcohol	
CLINITEST Set	
CLINISTIX Reagent Strips	
ACETEST Reagent Tablets	
KETOSTIX Reagent Strips	

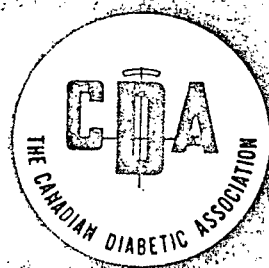
(Nurse) _____

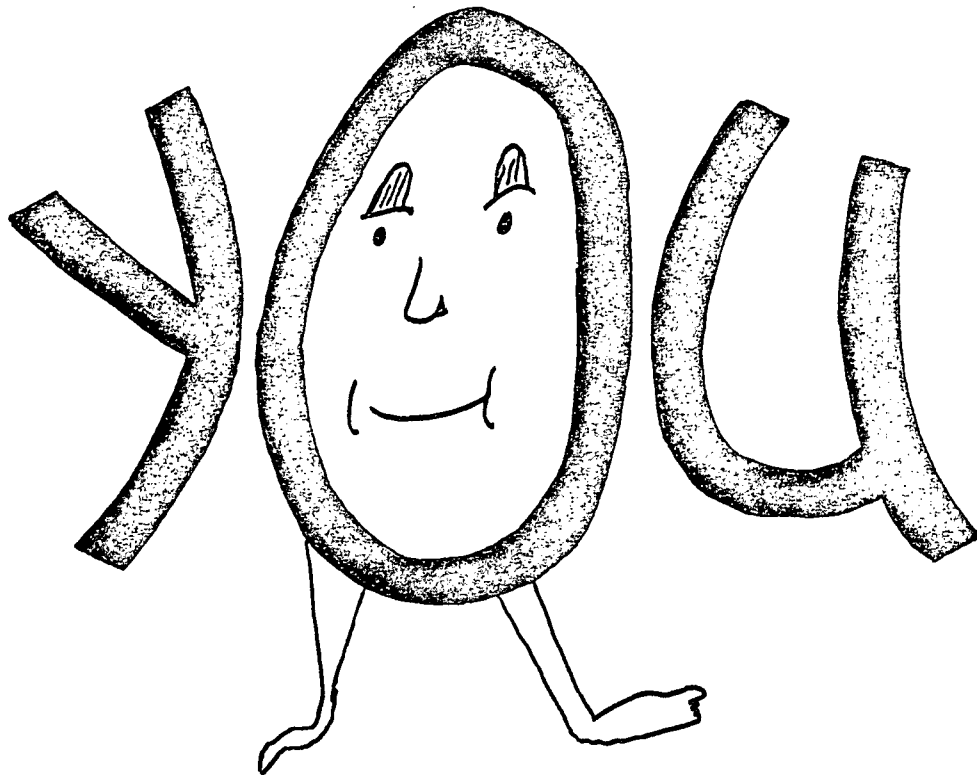
EXCHANGE LISTS

FOR

meal
planning

FOR DIABETICS
IN CANADA





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 six parts:

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

Your nurses will work with you on this course. They will only go as fast as you want them to. Most of the things they will teach you are things that you will do yourself every day at home. Ask them lots of questions to be sure you understand what they are saying. Remember, in the long run, your diabetic care is up to you!

Food-Energy Cycle

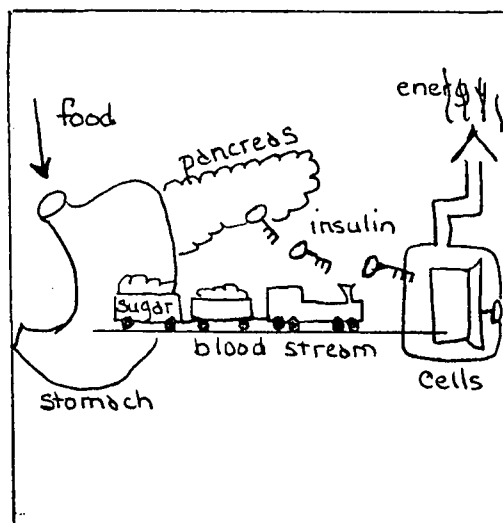
The human body is made up of millions of tiny cells. Therefore, each thing that the body does (working, playing and so on) is really done by a group of cells working together.

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.

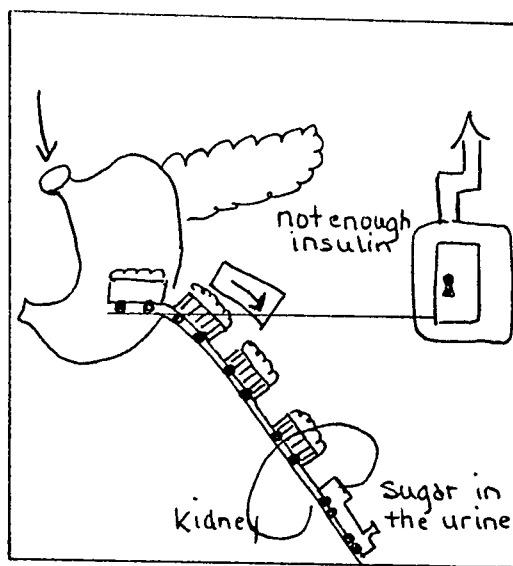


Diabetic Food-Energy Cycle

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.

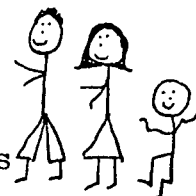
(Patient's Copy)

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?

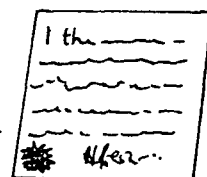
If you are single, diabetes shouldn't change your plans to marry. Because diabetes is so easy to care for, it causes no problems in relation to getting or staying married.



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.

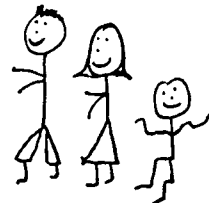
(Patient's Copy - for younger patients)

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?

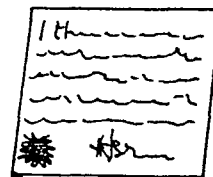
Because diabetes is so easy to care for, it causes no problems in relation to getting or staying married. So put your mind to rest about that!



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.



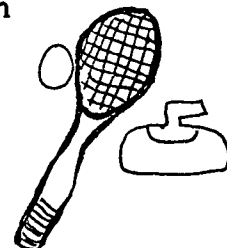
3. What about work?

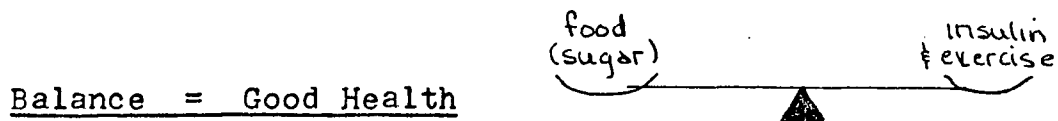
Diabetes will not stop you from working. Indeed, it probably won't even have much effect on the kind of work you can do. People with diabetes are engaged in almost every kind of work you could name (from desk jobs to labour to housework). Studies have shown that they do as well in their work -- in every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





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.

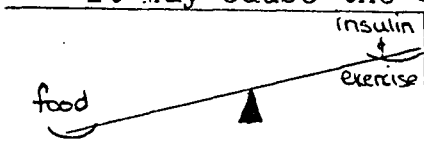
Tipping the balance to either side will result in problems. Keeping it even will result in good health.

(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.

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".

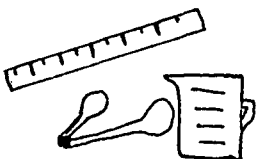
Usually the meal plan is given very simply -- for example, in terms of fruit, meat, bread, fat, milk and vegetables. Your nurse or dietician will give you a copy of your meal plan, which tells you how much of each of these foods you may have at each meal. With the food exchange lists these instructions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



(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
candy	jam	cake	condensed
	jelly	cookies	milk
	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 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. 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.

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.

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.

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.
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:

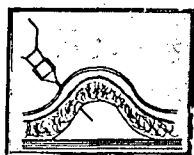
- (a) the stem of the plunger,
- (b) the top of the syringe,
- (c) the point of the needle,
- (d) the top of the insulin bottle.

(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.

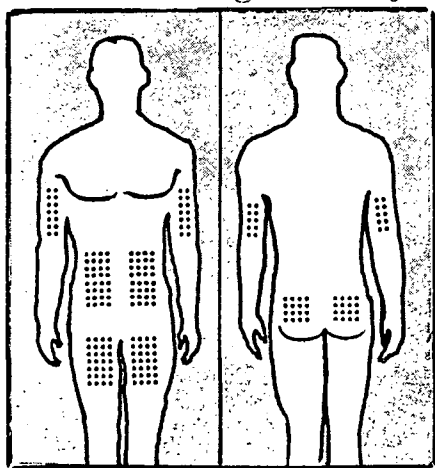
1. Clean the skin at the injection site with alcohol-soaked cotton.
2. Pinch up a large area of skin.
3. Insert the needle quickly into the skin at 60 to 90 degree angle.
4. Remove the hand that was pinching the skin. Using that hand, pull back on the plunger to be sure that the needle is not in a blood 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)

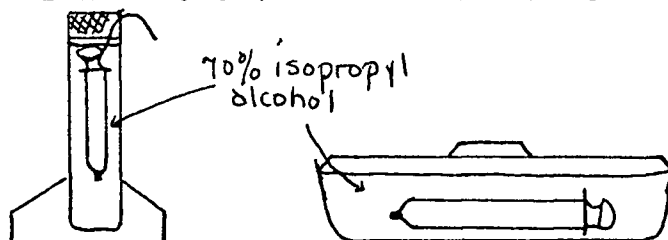
Care of Your Equipment

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. 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.

(Patient's Copy)

(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!)

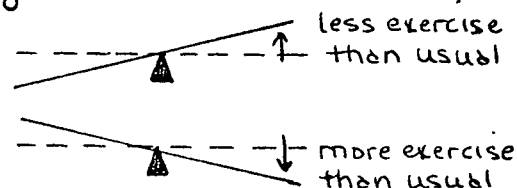
(Patient's Copy)

Exercise

Exercise is good for 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 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.

(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.

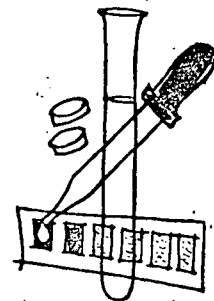
(h) Check your feet carefully every day, and report any skin changes which do not go away to your doctor.

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 $\frac{1}{2}$ -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 $\frac{1}{2}$ -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.

(Patient's Copy)

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.

Date	Times							
	7:30 a.m.		11:30 a.m.		4:30 p.m.		8:30 p.m.	
	S	A	S	A	S	A	S	A
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.

(Patient's Copy)

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.

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>	<ol style="list-style-type: none"> 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. Services. 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. Education. 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. "The Newsletter". 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. Encouragement. 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.

(Patient's Copy)

SOURCE	WHAT THEY CAN DO FOR YOU
<p>3. Public Health <u>or</u> Victorian Order of Nurses visiting nurses.</p> <hr/> <p>(phone numbers)</p>	<p>1. Do home teaching. 2. Give insulin injections at home. 3. Help with your food care if you can't manage it alone.</p>
<p>4. Dial-a-Dietician</p> <hr/> <p>(phone number)</p>	<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"> - 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 dieti- cian will call you back - within 48 hours - with the answers.</p>

APPENDIX E

REFERENCES MOST USEFUL IN DEVELOPING THE DIABETIC TEACHING TOOL

Books

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Learning About Diabetes. New York: American Diabetes Association, 1969.