

² Young, F. G.: Metabolism in Experimental Diabetes Mellitus (Sept. 24, 1948). *Lancet* 255:955-61, 1948 (Dec. 18).

³ Lawrence, R. D.: Insulin Therapy: Successes and Problems (July 22, 1949). *Lancet* 257:401-05, 1949 (Sept. 3).

⁴ Krahl, M. F.: Hormonal Regulation of Glucose Utilization by Tissues (July 28, 1950).

⁵ Long, C. N. H.: The Endocrine Control of the Blood Sugar (July 6, 1951). *Lancet* 262:325-29, 1952 (Feb. 16).

⁶ deDuve, C.: The Hyperglycaemic Glycogenolytic Factor of the Pancreas (July 7, 1952). *Lancet* 265:99-104, 1953 (July 18).

⁷ Tunbridge, R. E.: Sociomedical Aspects of Diabetes Mellitus (July 17, 1953). *Lancet* 265:893-99, 1953 (Oct. 31).

⁸ Hallas-Møller, K.: Chemical, Biological and Physiological Background of the New Insulin-Zinc Suspensions (July 16, 1954). *Lancet* 267:1029-34, 1954 (Nov. 20).

Teaching the Diabetic Patient

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Diabetes is a lifelong disease requiring more participation by the patient in his own care than most other diseases. His role is the important one in achieving the best regulation and thus preventing both metabolic and degenerative complications. In addition, normoglycemia can cause a decrease in the symptoms of both dynamic (infection, neuropathy) as well as structural (coronary and peripheral arteriosclerosis) complications. Recent studies^{1, 2} have shown the striking importance of self-care in preventing or postponing necrosis and infection of the legs even in diabetic patients with advanced peripheral vascular disease.

While the value of proper patient education has never been questioned, the degree of success achieved currently has been. An opportunity to evaluate the latter was presented by the Boston Diabetes Fair held yearly under the auspices of the New England Diabetes Association. In

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The major portion of this article is taken from an address given to the Six-Hospital Conference on Methods of Teaching the Diabetic Patient held at the Boston United Community Services' Mason Memorial Building on April 13, 1955. This conference was held for the purpose of coordinating and improving patient diabetes teaching and was sponsored by the Subcommittee on Patient Education (Samuel B. Beaser, M.D., Chairman) of the U.C.S. Diabetes Committee (Howard F. Root, M.D., Chairman).

1952, the Subcommittee on Patient Education* of the Diabetes Committee of the United Community Services of Boston questioned 128 diabetics (of whom 110 were under private care and 18 from various Greater Boston Diabetes clinics) who visited the Fair† and 110 patients in six Greater Boston hospital diabetes clinics. Ten standard questions were used which gave a representative though not complete survey of the patients' knowledge of diabetes. These were multiple choice questions as follows:

QUESTIONNAIRE ON DIABETES

Check the ONE answer under each question that is the BEST answer.

1. If you have a large amount of sugar in your urine, the urine test would show:
 - a. Blue
 - b. Orange
 - c. Olive
 - d. Green
2. What changes should you make in your diet if you have a severe cold?
 - a. Omit meals
 - b. Add extra orange juice to diet
 - c. Take liquid diet that gives same food value
 - d. Eat whatever you can

* Then under the chairmanship of Dr. Henry K. Bakst.

† I am indebted to the members of that committee who collected and analyzed data: Mrs. Elizabeth Caso, and Misses Lena DiCicco, Ann Ryan, Evelyn Rosen, and Ruth Richards.

3. What food can be taken in place of 1 egg?
 - a. 1/2 cup oatmeal
 - b. 1 slice cheese
 - c. 1/2 cup baked beans
 - d. 1 cup milk
4. How does the diet for the person with diabetes differ from the normal diet?
 - a. Contains more vitamins
 - b. Omits cereal
 - c. Is low in meat
 - d. Is regular in amount
5. Which group of foods should be divided among the day's meals?
 - a. Liquids
 - b. Carbohydrates
 - c. Seasonings (salt, pepper)
 - d. Vegetables
6. Can a diabetic have children?
 - a. Only by adoption
 - b. Yes they can
 - c. No they cannot
 - d. Only if one parent is not a diabetic
7. Which one of the following may cause an insulin reaction?
 - a. Infection
 - b. Omitting insulin
 - c. Strenuous exercise
 - d. Overeating
8. Good foot care includes:
 - a. Cutting corns regularly
 - b. Bathing of feet
 - c. Walking barefooted
 - d. Using hot water bottle to warm cold feet
9. Insulin dosage is measured by:
 - a. Cubic centimeters (cc.)
 - b. Drops
 - c. Units
 - d. Grams
10. The normal blood contains:
 - a. Some sugar at all times
 - b. No sugar at any time
 - c. Sugar only after eating
 - d. Sugar in the morning only
11. How often do you test your urine?

The results showed that all were distinctly deficient in knowledge of their disease.

It is the common impression among those dealing extensively with diabetic patients that both new and old patients are equally in need of education and at least yearly re-education. Both groups have their share of misconceptions about the disease. Moreover, it is fallacious to assume that a diabetic, however long his course, has been properly indoctrinated at the onset or subsequently. In addition, the elderly diabetic is extremely forgetful. Thus, in numbers those with old diabetes constitute the largest group to be taught and the greatest challenge.

In the past we have failed to capture the interest and enthusiasm of the diabetic patient for continual and

lifelong self-care. There has been an overemphasis on giving the patients purely medical facts, and not enough attention to influencing and promoting proper psychological attitudes toward the disease. Such errors of omission are of different sorts.

The diagnosis and prognosis of diabetes are not explained to a large proportion of patients convincingly enough at the onset of the disease. Diabetes is diagnosed in the majority of patients by casually discovered glycosuria. Many physicians still have difficulty accepting the concept that this asymptomatic stage of diabetes is an early phase of a disease, even though they have been conditioned to do so in other disorders such as leukemia, uremia, cancer, and others. Consequently, the majority of patients too frequently receive a halfhearted diagnosis couched in vague terms of "sugar in the urine or blood"; often even the use of the term diabetes is omitted. Little wonder that these patients entertain doubts regarding the reality or significance of their disease, for their physicians do not offer them adequate teaching.

In some diabetics, after proper therapy has normalized the laboratory findings, the patients may be erroneously told that the diabetes is cured or never existed. The patients only too willingly grasp at this straw and may disappear from medical purview. Subsequently, the disease or its complications is likely to return them to the fold much the worse for the experience.

PRINCIPLES OF PATIENT EDUCATION

All categories of patients will benefit by having the following principles impressed on them firmly:

1. It is important to emphasize the permanency of diabetes if the self-care and dietetic self-denial are also to be permanent. Psychologically, any shock caused by this concept can be cushioned by citing reassuring statistics on the longevity of diabetics.

2. Next, we must sufficiently delineate the changing and dynamic character of diabetes under the influence of other complicating diseases, or even arising spontaneously. This reinforces the need for continual and permanent medical supervision.

3. We should provide the proper knowledge of the potential seriousness of diabetic complications for the same purpose.

4. It is important to recognize how potent psychologically are the appetite urges which diabetics are being asked to restrain. Most diabetics are obese and probably have had an above average appetite so that dieting represents a relatively great sacrifice. In return for these sacrifices, we must offer them some positive psychological satisfactions in terms of better health, economic adjustment, successful childbearing, and so forth. This requires

a personal approach to each patient as an individual in his family or community setting.

5. Finally, physicians should remember that the problems posed by diabetes are very complex for patients, especially for those of advanced age. After a few years of poor regulation, mental and personality changes ensue in diabetics of any age and they become forgetful, stubborn and opinionated. Two difficulties then appear: the discrepancy between the problem and the capability of the patients increases and, due to poor judgment, the division of authority between doctor and patient becomes increasingly hazy in the latter's mind. It is, therefore, important to try to set definite limits to the patient's role in self-treatment in the initial teaching, and this should be re-emphasized from time to time.

The actual content of diabetes teaching material may be relatively clearly defined and can be conveniently subdivided into specific areas. Some of these topics require individual instruction, while some lend themselves to group teaching. For example, the sensitive subject of the description of the disease and its complications is best given by physicians personally and individually to patients to avoid psychological trauma.

Written material is an adjunct and not a substitute for personal teaching with its opportunity for individualization. Yet, there are some definite advantages to the former. The most obvious is permanency. Then, too, there exist some, though not large, differences of opinion with regard to some of the content of diabetes teaching material. There is less confusion for the patient if the views on these controversial areas are committed to writing as in a hospital diabetes manual.

CLINICAL PROBLEMS REQUIRING PATIENT EDUCATION

It may be profitable to point out from practical clinical experience the critical areas in diabetes education in which our program more commonly falls down.

There exists the paradox that only a small fraction of patients are permanently well regulated, even though 80 to 90 per cent could be by the use of the improved types of insulin. This is most often due to the failure of education or to lack of cooperation by the patient with respect to diet, even though the degree of dietary cooperation required for normoglycemia is only a day-to-day constancy of ± 15 to 20 per cent. Less frequently, it is due to lack of understanding by patients that a correct diet is still the important prerequisite even when insulin is added to the regimen.

In insulin-treated patients, unsatisfactory metabolic regulation is frequently accompanied by insulin reactions. Only a small minority of these reactions are due to actual

lability of the diabetes or "brittleness," although they are usually so labeled. Actually both physician and patient can profit by adopting the optimistic point of view that insulin reactions are usually avoidable by scrupulous attention to the details of diet or insulin administration.

It must be made clear to the patient that with the use of continuous and long-acting insulin, regularity of food intake including the bedtime snack is a necessity. The patient, if not properly briefed, may extend the allowable freedom of food-equivalent exchanges within each meal to the license to make unphysiological shifts from meal to meal. Diet prescriptions which include a total 24 hour food list encourage this error.

Reactions are less frequently due to misconceptions regarding insulin administration. On the part of the physician, reactions may be due to the routine prescription of NPH insulin to all diabetics requiring insulin without an awareness that fully 30 per cent require different ratios of long to short acting insulins. On the part of the patient, errors occur from the use of combination U40-U80 syringes or the inadvertent substitution of syringes when purchased without prescription. More avoidable are the errors resulting from the granting of permission to the patient to alter insulin dosage by urine test without explicit and written instructions.

Occasional insulin hypoglycemia is almost unavoidable in some patients regulated to the point of normoglycemia. Yet, this too can be minimized by proper education. The need for extra food can be anticipated for those in whom exercise has a hypoglycemic effect. Further, such patients can be taught to recognize minor degrees of hypoglycemia which frequently occur at set hours for days prior to the apparently sudden occurrence of a severe attack.

Diabetic coma still occurs, although it is becoming rarer. Coma may occur repeatedly in a given individual as a result of a personality disorder. It is important to recognize the psychological rather than the physiological basis for the regulation defect in such patients in order to effect a permanent solution. In patient education, a routine description of diabetic coma is insufficient. Emphasis should be placed on the synergism of a complicating disease and a chronically poor state of metabolic regulation. Also, it is necessary to expose the fallacy that the latter necessarily reflects itself in subjective symptoms or in a fasting (rather than two-hour postprandial) urine test in the face of the usually elevated renal threshold. In effect, the emphasis should be shifted to the need for periodic medical observation and blood sugar determinations.

Finally, with regard to peripheral vascular complications, the patient should be given definite written instructions regarding foot care, and the dangers of self-

surgery and self-medication should be clearly underlined.

SUMMARY

Education about diabetes does not consist simply in presenting the basic facts to patients. Rather, it should be directed to a real understanding of the disease and a proper attitude toward its care by both patient and physician. A more precise definition of the area for which the patient is responsible will prevent both his overstepping the bounds or, even worse, ending up completely outside medical supervision. It is entirely reasonable to propose that good medical care of each hospitalized diabetic regardless of the cause of admission is not complete until he has been educated in self-care. The responsibility for this program in the hospital should properly rest upon both the administrative and professional staffs, with the understanding that patient education is a vital facet of the minimum standards of medical care in their institution.

SUMMARIO IN INTERLINGUA

Insegnamento del Patiente Diabetic

Le education del diabetic non se exhausti in presentar a ille le factos fundamental del morbo e de su tractamento. Le objectivo de tal education debe esser le dis-

veloppamento de un ver comprehension del morbo e de un appropriate attitude verso su manipulation non solamente del parte del patiente sed etiam del parte del medico. Un plus precise definition del area pro que le patiente es responsabile va prevenir transgressiones e—lo que es ancora multo plus importante—le complete escappamento del patiente a omne supervision medical. Il es integremente rationabile insister que le tractamento medical del hospitalisate diabetic individual (sin riguardo al causa de su admission al hospital) non es complete usque ille es ben educate in su deberes autophylactic. Le responsabilitate pro un tal programma educative in le hospital es justemente un carga del personal tanto professional como etiam administrative. Il debe esser comprehendite que le education del patiente es un aspecto vital del standards minimal de sollicitude medical in nostre institutiones.

REFERENCES

- ¹ Wessler, S., and Silberg, N. R.: Studies in peripheral arterial occlusive disease. II. Clinical findings in patients with advanced arterial obstruction and gangrene. *Circulation* 7:810-18, 1953.
- ² Edwards, E. A., McAdams, A. J., and Crane, C.: Events leading to major amputation in patients with arteriosclerosis. *New England J. Med.* 249:514-19, 1953.

Old Age is a State of Mind

In summary, one might briefly outline some of the main needs of the older person as follows:

1. A chance to be useful, creatively productive.
2. A chance to be active.
3. The need to be loved or wanted.
4. The need for financial security.
5. A chance to be a free human being.

In order that these things may accrue to him, the senior citizen has certain tasks for which he alone can be responsible. Briefly these are as follows:

1. To learn to adjust to declining physical capacity.
2. To learn to compensate for loss of friends and family as inevitable death removes them from the scene.
3. To learn to live happily in spite of reduced income, loss of social status due to loss of useful, respected role in society.
4. To learn to utilize effectively increased leisure.
5. To develop a basic philosophy toward life for later years.

In amplifying this last statement there should be some discussion of the religious implications involved. If we induce our senior citizens to believe that all change and advancement in life are perfectly timed, perfectly tuned, and harmonized in divine order and good will, they may find the adjustment to advancing years not too difficult to make.

After all, old age is just a state of mind. The philosophy of the candle might prove an inspiration to many an oldster. This couplet, the source of which escapes me, is as follows:

I'll soon be dead, the candle said.
I, inch by inch, decline.
But I make light of my sad plight
For while I live, I shine.

H. A. Steckel, M.D., from
"Emotional Aspects of the Aging
Process," *New York State Journal of Medicine* 55:3605-06, Dec. 15, 1955.