NEW DEVELOPMENTS IN DIABETES EDUCATION

A call for a new task for the patient

From classical to holistic approach

The results of the Stockholm and the DCCT studies demonstrate a causal relationship between increased levels of blood glucose and the development of long-term complications (1, 2). This offers new therapeutic hope for patients and health care providers. The burden of long-term complications can be relieved if patients can achieve near normal blood glucose levels, in order to reach this objective health care providers have to change their strategies in the way they follow-up patients. Effective strategy requires a new view on the role of patients and implies that health care providers; manage specific skills in the field of follow-up of patients and education. A qualitative different understanding of the role of the patient in the treatment of diabetes is call for. It is the experience of many persons involved in the Diabetes Education Study Group activities that these new techniques can be learned and applied in a busy clinic.

A central question both for patients and health care staff then is «How can I learn to normalise the blood glucose values»?

Introduction

We all recognize the gap between what could be achieved and what is actually achieved in diabetes care. Many people have tried empirically to change this issue. Most activities were centered around the needs of the health care providers. However more and more awareness has focused on the learner's perspective, how does a person learn meaningfully ?

This teaching letter was created with the purpose of bringing you in contact with recent developments in diabetes education. In order to do so, we will make a short review of developments in the field of general education, and translate those concepts in to the field of patient education. To bridge the gap between educational theory and clinical practice, we will illustrate with examples taken from daily situations we all encounter in the field of patient education. After having grasped what «it's all about» you may want to practice.

Therefore we will conclude this letter by giving you some practical directions.

The "physiology of learning" 

Way before educational science was formed and became interested in adult education, the Swiss educator Heinrich Pestalozzi (1746-1827), (21), gave the teachers of his time some recommendations that still are valid in the field of patient education. They can be divided into six steps:

1. First show concrete examples before starting to speak.
2. Start with the most simple facts, the closest and most well known to the student's life.
3. Progress from simple facts to more complex situations taking great attention not to jump too fast and miss the intermediary steps. To illustrate the notion of continuity Heinrich Pestalozzi took the example of the slowly progressive growth of an organism.
4. Progress very slowly in order to avoid unnecessary tiredness or tension in the student.
5. Foster personal work and creativity; with this you may foster independance.
6. Make links between what has been understood and practiced in a given field with other sectors of life where they can be of use, in doing so you help the integration of the student in the society.

This can well serve as a trigger and background for the development of the concept of understanding we focus on in this paper.

The educational development in the field of patient care in diabetes has followed two basic lines from the seventies to the nineties (Table 1). One is the orientation towards content/description of what the patient has to do. The other implies a new relationship between the physician/nurse and the patient. Listening to the patient's way of experiencing his disease and its treatment, and to, promote his understanding of it, becomes a main task.

Table 1 Development of educational concepts in diabetes education

<table>
<thead>
<tr>
<th>Educational orientation</th>
<th>1970's</th>
<th>1980's</th>
<th>1990s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art of knowledge</td>
<td>Instruction information</td>
<td>Problem oriented</td>
<td>Active learning</td>
</tr>
<tr>
<td>Art of knowledge</td>
<td>Medical facts on diabetes</td>
<td>Well defined medical problems</td>
<td>Individual experience</td>
</tr>
<tr>
<td>Communicative competence</td>
<td>Authoritative, prescribing</td>
<td>Group discussions centred around teaching devices</td>
<td>Dialogue</td>
</tr>
</tbody>
</table>
1. A quantitative meaning. The definition of knowledge of these students was the quantity of knowledge. It made them pass the exams, i.e. it was equivalent to the number of right answers to the teacher's tests. This represented a kind of piece-wise approach to knowledge. Taking the metaphor of a puzzle, students had almost no view of the total picture, but could speak about single pieces of the puzzle. Closed questions, multiple choice questionnaires may favour this kind of learning.

2. Many different and possible answers. In this definition students stressed that the knowledge they had acquired was the result of interaction of the various parts of the main content to be understood. In other words, for a given question several possible answers, all equal in value, could be given. The students understood knowledge as the global picture of the puzzle. In this description students spoke of knowledge which was external to them.

3. A new knowledge, associated with a personal experience. Another group of students described that the knowledge they acquired took existence only through a translation with their personal experience. This created a personal reference for the knowledge they had to acquire. When they had to study these students therefore looked for different ways to intergrate new knowledge with their previous experiences.

This process could be called -meaningful learning- and favors knowledge which is really meaningful.

Perry found that the majority of beginners mentioned category 1, but that there was a strong tendency to change conceptions from 1 to 2 or better to 3 after one year of studying.

These findings mean two things: There was a qualitative variation in the conception of knowledge, and there was a qualitative development of this knowledge as a result of the experience (or the frustration) of studying.

Perry's work started an intensive search for how meaningful learning is established. The research focused on learning, understanding of meaning and the importance of a correct learning perspective for the student.

Important contributors in this field of pedagogical research came from Sweden (4,5) and England (6,7,8).

They were particularly interested in the way people grasped a -phenomenon-, a fact and its implications that has to be understood in the world around. In diabetes care for instance, glucose balance by the organiser and monitoring and control by the patient can represent such a phenomenon. Therefore in order to help the patient to master glucose control, health care providers have to help him to discover and personally understand the various fans (biological, environmental, psychological, etc.) and their reciprocal relationship in glucose control, all this constituting the so-called "phenomenon". This new approach to teaching offers promising possibilities for health care staff. It can help them to understand the patient's situation more globally, and it will direct the patient's support in a more efficient way.

The concern of diabetologists in having their patients master the various skills for daily control would thus require new in-depth inacting of the way patients learn.

The educational approach may induce two different ways of understanding

Patients understand and practice self-care in different ways. Among the many factors which influence this outcome, the educational approach has a major influence. The way patients have been educated, which in turn influences their thinking and behaviour, is illustrated with the following two examples.

1. A fragmented understanding which corresponds to a «surface structure» of thinking. This understanding of diabetes is that of selected details which have no connections with each other. In this instance these details do not form a meaningful structure and therefore do not help the patient to understand how to manage the treatment. This type of understanding could be held by a patient measuring blood glucose but who is unable to analyze the data he accumulated. For this patient, diabetes and blood glucose readings are bits of facts that he cannot connect into a meaningful structure of thinking and translate in appropriate action. Today the majority of patients who have received instructions are functioning in this way.

2. An integrated understanding which is bound to a «deep structure» of thinking. In this situation the patient has learned to manage a sequence of events: to observe different facts (blood glucose values over a period of time, food intake, amount of exercise, etc.), to analyse them, to relate them to each other in a meaningful way, and later on to take appropriate action for his treatment. This represents a person who has been able to integrate personal experience with basic knowledge of diabetes and, as a result, take appropriate action for treatment. This represents a person who has been able to integrate personal experience with basic knowledge of diabetes and, as a result, take appropriate action for treatment.

In other words, the patient with a surface understanding would passively collect blood glucose values while a patient with a deep understanding would be able to manage his illness and balance his diabetes control according to the demands and variations of daily life.

Learning approach and outcome

Svensson observed that certain educational strategies favoured a surface structure of understanding and he called those strategies anatomistic approach to learning (9). He opposed them to the holistic approach, to learning which leads to a deep structure of understanding. There is a relation between the way we understand a task, the way we go about it and the outcome (10-13). In the field of diabetes this implies that dicte would be a relationship between how the patient understands glucose control and the way he balances his blood sugar. Thus, proloning the patient's understanding as a means of helping him to become more successful in his control of the disease is a central task for the staff. This opens the way for a new therapeutic approach to diabetes where specific educational methodologies are central to therapy.

Perry's conception of knowledge was restricted to academic learning. We have shown its translation in the
professions the technical knowledge is acquired during the first clinical years working with patients. At the level of patient education, technical knowledge could be represented by the skill to be able to select the right food (carbohydrate equivalent, content of calories, etc.) according to a theory of meal planning.

3. Confident, silent, knowledge: This is an important but different kind of knowledge. This is knowledge we acquire through practice and routine. It cannot be learned from a textbook. This knowledge makes us feel secure and safe in the events of our daily life, e.g. riding a bike or driving a car. In the field of diabetes, confident knowledge would be the knowledge a person masters almost automatically and which permits him to balance his blood glucose by varying food, exercise and insulin doses. Confident knowledge is acquired through training, experiencing, observing the outcomes and reflecting - not by simply reading texts only. It is the knowledge that patients should aim at in order to control their diabetes, and health care providers can play an important role to promote it. This makes reflection and interpretations very central in patient education (18). Experience shows that with patient education we have too often fostered factual knowledge, having too much spoken about the facts of the disease and its treatment, rather than having encouraged patients to master technical knowledge as well as encourage practice which can lead to secure, confident knowledge.

Since the personal experience is of major importance in confident learning, in our field of patient education, the description of the patients' ability is fundamental in the process of education and therapy. Only when the patient describes his own reality and experiences can health care providers understand what happened, what the patient means and how he understands certain phenomena. It therefore becomes essential to take the learner's perspective, and take his conceptions, beliefs and representations into account in the educational process. This looks obvious but often it is very difficult for the health care provider to appreciate and fill the gap between patient's understanding and the medical requirements and needs.

The school system model versus adult education

Seneca, born 55 BC, already said, «one should learn for life and not for school». Translated in the field of patient education this would mean that patients have to learn about diabetes management for their quality of life and not for the benefit of health care staff resulting in that tens of thousands of home blood glucose measurements are made by patients without any effect on treatment. Health care providers usually tend to copy the way they were taught during their studies. Unfortunately this is not a model which is helpful in patient education. When it come to learning an adult has other needs than a child.

Child versus adult learning could be described as follows: a child is in an expanding knowledge system, where most items are unknown or at least poorly integrated. A child can add knowledge to his own system. An adult, on the other hand, represents a «closed, knowledge system built on personal representations. Every part of knowledge is integrated in the complex world of the individual experience. Basically this means that for new knowledge to be accepted, something has to be removed or changed (14). This change is often subconsciously resisted.

Taking the learners perspective in patient education means to utilise his experience as a learning device. The findings of Perry (3), Säljö (12), and Svensson (9) all point out that learning is based on the learners' understanding and interpretation of personally observed and experienced reality.

This brings the pedagogical tradition very close to the phenomenological tradition (15,16) where the question of construction of reality is a major topic (17). According to Heidegger (13), the central aspect of knowledge is its capacity to sustain individuals' ability to grasp reality.

Strategies for an efficient educational-therapeutic approach

Three strategies can be formulated from the above observations for an educational-therapeutic approach and we propose that health care providers involved in diabetes care should master them.

1. Focus on the patients experience and practice. Ask for his understanding of diabetes using open-ended questions (starting with "how", "what", ...) and avoid asking for his explanations (thus avoiding "why-> questions).

If you find that the patient's understanding is leading him to incorrect action, do not stop him immediately and do not give the correct answer, but try to make him interested and curious about a different way to understand the phenomenon. Even if this recommendation looks evident and simple, experience shows that in practice it is difficult for the health care provider to switch from the role of the decision maker to that of a tutor, particularly for the busy clinician.

Experience shows that when health care personnel start patient education using their medical way of thinking, then patients often experience great difficulties in integrating these medical facts with their own personal experience. On the other hand when the patient builds his own understanding, this new knowledge will be remembered and trusted. Several training programmes that train the skill to promote the patient's understanding are currently available for health care providers, e.g. through the DESG.

To establish a clinical diagnosis a physician firstly works on a collection of information stemming from the physical reality (body) of the patient (physical examination, X-ray, biological values, etc.). The same process of investigation holds true for patient education. But now the initial assessment stems from the body of knowledge the patient has about his disease and its treatment (basic medical knowledge, beliefs, representation, etc). If this initial approach is the same for establishing diagnosis in either the biomedical or educational dimensions of the patient, the
blood glucose level. Instead, focus first on the good effect of lowered blood glucose and mention hypoglycaemia as a side effect to his treatment. Then mention the warnings and preventive measures which will be understood in a different way when presented in a different context. It is well worth thinking through how you present the various topics, particularly when you have to teach your patient in the field of long-term complications.

3. Try to enhance your patient’s understanding. Remember that not only what you teach but also how you teach will have an effect on the understanding of your patient. Therefore, your educational strategy will influence the quality of treatment. For instance, the patient who says he manages his blood glucose levels by following a fixed or semi-fixed dose insulin regime has a qualitatively inferior understanding of blood glucose control than the patient who is able to adjust the insulin doses in a flexible way. This patient could do it because he has learned to adapt treatment according to his way of living.

If you discipline yourself to take the role of a tutor, you will help your patient to construct, use and improve a new understanding of diabetes therapy. By doing so you have entered in a new comprehensive diabetes education programme based on recent research on adult education.

One fear that health care providers have is that there are as many personal representations of a phenomenon as there are patients. Research shows that this is not the case (20). Most phenomena are, however, conceived of in a limited number of ways. This makes it possible to use knowledge about this variation of conceptions, as an educational frame, both in order to define levels of comprehension, but also to find ways and means for teaching.

Here is an example of the different conceptions patients have of the phenomenon of -retinal haemorrhage-. One group of patients described it as a «major loss of blood that could threaten life», another group said that it was «connected with instant blindness». The last group of patients said «one may have no visual disturbances but it requires immediate follow-up by an eye doctor». Taken that patient education has to start from the patient's representation this example shows how different the approaches would be from one patient to another. Health care providers have to appreciate the variation in the patient's understanding and build their message from each patient's unique representation.

To summarise, the reorientation in educational-therapeutic approach could be as follows:

Knowledge, in its three parts, is seen as a dynamic system, organised into certain structures forming an internal relationship between man and the world.

Learning is a change in this relationship occurring as a result of the individual interpretations often within the knowledge system.

Teaching becomes a set of systematic reflections on the differences of meaning between conceptions of a phenomenon or a task. This calls for a dialogue between teacher and student and conditions that will generate experiences, e.g. home blood glucose readings.

What does this mean for patient education?

A deep-oriented approach to learning could be described this way: «In order to help a patient to learn, the health care provider has to give him only a few facts, those really indispensable for the treatment on a daily basis, ask his patient to solve some simple problems, let him make all sorts of comparisons with other situations, and be quite happy about errors, all of which may well represent the ideal way to help patients to learn, providing that primary attention is given to the causes or the errors as previously seen- (18).

Ideally, in order to change the understanding of patients, the teacher should know the patient's conception and spontaneous way of understanding a given phenomenon. For example patients who are convinced that the only reason for having high fasting blood glucose levels is dietary intake of carbohydrates, may be unable to understand the reason for bedtime insulin coverage in order to lower liver night glucose production. For the tutor it therefore may be of great help to know beforehand, i.e. the variation of patient's understanding of this phenomenon before a medical explanation.

The warning against abstract medical knowledge is well justified. By letting the patient solve relevant personal problems, related to the disease, a natural pace is set for the learning process and integration of new knowledge in the patient's world. This ensures that the teaching will always take place within the context of the patient.

Examples of training programmes

The authors have made great efforts over the years to develop training programmes for health care providers centred upon the strategies of helping patients to learn, as well as the needs of the health care providers for more efficient interdisciplinary activities. These examples may hopefully be of use in the field of patient education and care, not only in Diabetes Mellitus, but also for people suffering from other chronic diseases. The following short outlines of each of these programmes may give ideas of possible approaches.

The Diabetologicum

In Sweden we have Laced a specific approach to train health care providers. The "Diabeteporogic," is a training course
3. The health provider evaluates the learning process by checking the understanding behind the patient's observations, analysis, and decision taking in his environment. Learning is noted as qualitative shifts in the patient's understanding.

4. The teaching activity is dominated by a scheduled plan following a list of problems that the patient has provided. This plan is called a plan for development of patient understanding and it is integrated in the medical treatment. It means that the patient is constantly being questioned in areas which either lie himself has asked for knowledge or in which the health care staff suspect misconceptions and mistakes. Thus, lack of skill to handle his diabetes is traced back to how the patient grasps what it is all about. If you have to make direct medical interventions, tailor them to the patient's understanding.

The DiabTrain model

This is a series of exercises which should help us to grasp different concepts of learning and that can be used to demonstrate their importance for doctors and nurses involved in the care of people with long-lasting diseases.

Teaching educational concepts is difficult. DiabTrainTM offers you a chance to experiment and learn by experience. The exercises with the little train should help you in a concrete way:
- to understand what learning is about
- to realise how little impact instructions have on the person who has to learn new skills
- to realise the fundamental role of direct experience in a learning process
- to understand some of the key differences between acute hospital medicine and chronic ambulatory care

Included in the DiabTrainTM package is an engine and three carriages, a board to play on and an instruction leaflet. If one follows the instructions provided with the DiabTrainTM one may learn what it means to be a tutor and a patient in the new setting for diabetes education.

The teacher invites a person to play and explores how learning can take place. Handling the train is a metaphor for how to handle blood glucose and to bring it down from high levels to normal. The patient's task is a complex one, and this is illustrated here by asking him to back-up the train by holding the chimney of the engine. Pushing the train backwards and keeping it within the two parallel lines on the board is, in the beginning, as difficult as controlling blood glucose.

Soon the person in the role of the "patient" will experience that the train starts to go off the track. Now the tutor has to find ways of helping him learn how to keep it on the track. Invite the person to experiment and reflect on what he observes. Gradually he will start to grasp the situation.

Observing what happens with teacher and student as they both learn to bring down glucose from a high to a low, normal value, is quite informative. The train exercise should be an introduction leading to the kind of observations and reflections that the health care provider can make when following a patient. Remember treatment of diabetes involves an active role of the health care provider to facilitate the learning process of the patient.

We have not seen a single health care provider who can tolerate tedious, monotonous teaching without losing his motivation. If, on the other hand, physicians and nurses participate in this new learning approach they will find a tremendous motivation and challenge in practising education.

The Grimentz workshops

These are 5-day seminars organized every year in the Swiss Alps since 1989. Their aim is to improve quality of care and of life for patients suffering from chronic diseases, by specific training of health care providers (doctors, nurses, dietitians, psychologists and other paramedics, often working in the same team). By using these specially formulated workshops they exchange and pool their clinical experience which is then commented upon and formalised by specialists coming from medicine, nursing, education and/or psycho-social sciences. They help the participants to increase their potential for development and change.

The workshop also emphasizes the importance of understanding how patients live with diabetes and which difficulties they have to master in the marrriage of their disease. This kind of workshop develops a deeper knowledge of how patients function in the management of their treatment and how the health care staff can create ways to support and encourage them. Over eight hundred health care providers from many different countries have participated in this on-going programme of Grimentz.

U. Rosenqvist, J 7-beman, and f-Ph. Assal, (March 1995). For further information and orders regarding staff training and the DiabTrain write to DESG secretariat, clo Division of Therapeutic Education for Chronic Diseases, 3HL, University Hospital, 1211 Geneva 14, Switzerland.

Mrs. M. Käser is to be thanked for her secretarial assistance.

References
2. Diabetes Control and Complications TrialResearch Group: The effect of intensive treatment of diabetes on the


