Diabetes compensation in *on-line* mode:
II. Application of the method. The first visit.

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The method of diabetes compensation set out below has been developed on the basis of my experience in my own diabetes compensation and extensive literature on diabetes problems.

To begin with, I would like to recommend several excellent books I resorted to in my studies to everyone interested in this problem. They are:

1. Astamiriva H., Akhmanov M., Handbook of a Diabetic. Moscow, EKSMO-Press, 2000-2003, pp. 395 (in Russian).
2. Dreval A.V. Diabetic's Manual, 1995, Available on the Internet, http://www.diabet.ru (in Russian).
3. Aldo A. Rossini, M.D. Ruth, R.N. Lundstrom, The Healing Handbook for persons with diabetes, Medical School, Worcester, MA 01655 USA.
4. Eberhard Strangl, Hellmut Mehnert, Das gro?e TRIAS - Handbuch fur Diabetiker, Georg Thieme Verlag, 1998, Russian translation - Moscow, 2002)

I started helping other people suffering from diabetes using my knowledge on diabetes compensation spontaneously, after meeting people with stably high sugar content of long standing (a year and more). Meanwhile, they were treated by family doctors and even consulted endocrinologists. It seemed strange to me, taking into account the excellent supply of diabetic drugs and availability of a broad range of foodstuff for diabetics. However, my first conversations with these diabetics have brought me to the idea that two basic factors for their compensation were lacking:

1. these patients had practically no knowledge of diabetes and its peculiar properties, and therefore were unable to help themselves rationally;
2. today's methods of medical care of diabetes patients do not allow efficient day-by-day diabetes control (as I stated in detail in the first part of this article that will be referred to as (I) hereinafter, http://www.russianseattle.org/diabet/diabet_on_line.pdf).

I have not mentioned here peculiar features of diabetes course in various patients, but in case of *on-line* compensation, such features can be revealed comparatively quickly. Certainly, I do not mean very complicated cases requiring special examination, which are beyond my competence. Having faced with one case of such kind, I recommended the diabetic to ask for a referral for hospitalization. As far as I know, he did not receive it, and I am unaware of his further state.

Proceeding to the practical aspects of my work with diabetics, it should be mentioned that they applied to me because they failed to reduce their sugar level close to the norm.

As a rule, our initial acquaintance is realized by phone, and I ask the diabetic some preliminary questions. Besides objective clinical data, his wish to undergo treatment and, at the same time, to master the skill of compensation are of great importance for me. Then we make an appointment, and I ask him to bring to our "live" meeting the results of a recent blood test and medical documents that he considers necessary to show me. Such meeting usually takes 2-3 hours. In the first place, I ask the diabetic to fill in my standard questionnaire, and after that we work out the strategy of compensation together.

Below is the text of my questionnaire:

1. Age. How many years he suffers from diabetes. Diabetes type. Is the native insulin content analysis available?
2. Recent results of glycated hemoglobin (HbA1c) analysis.
3. Weight, height.
4. Presence of diabetes complications.
5. In case of diabetes of the 1st type, what kind of insulin is applied. Insulin dose. Injections schedule.
6. In case of diabetes of the 2nd type, what kind of tablets are taken. Is diet only or mixed therapy (injections + tablets) applied?
7. Dietary pattern.
8. How many times a day and when sugar content in blood is checked.
9. Physical activity during the day.
10. Ability to control his own diabetes. Knowledge of the methods of diabetes compensation. Cooperation with the doctor.
11. Has he ever been hospitalized because of diabetes?

Below I comment on each of these items, give the answers of some diabetics I have worked with and draw conclusions from this initial part of compensation process. Here I apply the same numeration as in questions above.

1. The answer to this question is of basic importance for choosing the treatment tactics. After inquiring about the type of diabetes – insulin-dependent (IDD) or insulin-independent (IID) one, – I, naturally, inquire about the result of C-peptide blood test (in order to know native insulin content). Most often, diabetics are unaware of this, because most of them are 45+ years old, and a doctor usually assumes that a patient suffers from IID and offers sugar-reducing tablets at once. However, it is known that even the type and dosage of tablets should be carefully chosen, this choice being essentially dependent on the native insulin content. I think it is wrong to assume that at such age the diabetes is always of the 2^{nd} type (IID). Therefore, native insulin content analysis should be a general rule, and not an exception to the rule. I usually ask a patient to get an appointment to such blood test, but as far as I know, many doctors consider this analysis unnecessary and do not comply with such requests.

2. All my patients were aware of it. Usually, their HbA1c exceeded 9% (for some of them – 12-14%), although most of them were on insulin. However, none of them knew the correspondence between HbA1c index and sugar content in mg%. I explained the meaning of this index to each of them, and gave them a table showing the correspondence between HbA1c and sugar content in mg%. Understanding of this correspondence is of great psychological importance, since a diabetic grasps the notion of sugar content in blood, and not HbA1c. Thus, when he finds out, for instance, that HbA1c = 12% corresponds to the sugar content averaged over 3 months equal to 350 mg%, he understands his situation at once.

3. It is known that the answer to this question is important for many factors affecting diabetes compensation! Prescribed doses of medicine, choice of tablet type, the degree of insulin assimilation, etc. depend on it. However, my patients mainly knew that excessive weight was harmful. Every doctor states this, and his main advice to a patient that he fails to compensate is to lose weight, without explaining the reasons for that. I, however, explain in detail why an excessive weight plays such an important part in the compensation and what are the mechanisms of insulin assimilation and of other related processes. As my experience shows, a reasonable approach of a patient leads to positive results. In our further work with the diabetic, we always place emphasis on this problem.

4. Unfortunately, the answer to this question was nearly always positive, since the diabetics I worked with had been suffering from diabetes for several years and during this period remained uncompensated. The most frequent answer to my question about the causes of complications was “because of high sugar content”, since “high sugar” being a cause of complications is an axiom for any diabetic. Here I would like to attract attention to some well-known facts available in medical literature, but unfamiliar to patients.

Very often it is stipulated that glucose, with rare exceptions, does not fall into cells without insulin, and so called insulin-independent tissues that take up sugar from blood independent of the presence of insulin constitute such exception. If there is too much sugar, it penetrates these tissues in excessive amounts. Such tissues comprise brain, nerve endings and nerve cells, eye lens, inner coat of blood-vessels, etc. Therefore, the first consequences of high sugar content in blood appear in these tissues, and this is the origin of all future complications. From the very first day of the disease, a diabetic should be aware of the results of poor diabetes compensation, although he does not experience any physical pains or discomfort.

5. My patients, in general, did not understand the reasons of prescribing one or another kind of insulin. Neither did they know the kinetics of insulin assimilation with time and the correlation between the food intake time and this kinetics. They followed a rigid schedule of injection time and food intake time indicated by their doctor. They had no slightest idea of the necessity of correlating these parameters and of their dependence on various internal and external factors. In such situation, any compensation is out of question. In the course of our first conversation, I try to explain, at least superficially, the phenomena essential for the compensation, while detailed information and clarifications is given in the process of *on-line* work with the patient, when we talk over the actions required for the compensation.

It is noteworthy that I perform diabetes compensation using only insulins and tablets prescribed by a doctor.

Only if I make sure that medical recommendations are wrong (for instance, short-term insulin is not prescribed to a strongly decompensated diabetic), I strongly recommend the patient to ask his doctor to prescribe the necessary type of insulin (or tablet).

The doctor's reaction to such requests is often negative. Unfortunately, some doctors are against the patients' awareness of their disease, although it is generally accepted all over the world that regarding the diabetes compensation, a diabetic and his doctor should act in close contact. Otherwise, it is impossible to achieve positive results in diabetes treatment and to prevent complications.

Concerning the doses of the administered insulin, my patients had no knowledge of the necessary doses and of their dependence on the amount of carbohydrates in their food. I briefly dwell on it during our first meeting, and in the course of our further work expand and define more exactly this information. According to my experience, after a short while they master this information and actively use it.

As for the time of insulin administration, the patients had a poor knowledge of its connection with the type of insulin and time of the day (the necessity of taking into account the risk of nocturnal hypoglycemia).

6. Diabetics of the 2nd type could easily name the prescribed tablets. However, they did not know, in the main, how these tablets acted. Namely, they did not know whether the tablet stimulated insulin secretion or increased cell sensibility to insulin (for instance, like metformin), or maybe slowed down glucose absorption from the intestines into blood. It resulted in the incomprehension of the tablet intake regimen and of the principles of foodstuff choice to suit one or another tablet.

As for mixed therapy application, I have encountered such cases in my practice, but more rarely than it is accepted in today's practice of compensation. The patients had no knowledge of the subject and blindly followed their doctors' prescriptions. However, as far as I know, this therapeutic method is the most complicated, since it combines more factors than ordinary tablet or insulin therapy. It is no wonder that such diabetics, with their lack of knowledge, were more decompensated than others.

7. Most diabetics thought that the food intake time depended only on the injection time and did not connect it with glycemia level at a given moment of time. They also did not connect the food intake time with the assimilation kinetics of a given insulin or tablet. For example, I asked them, "Will you eat if you have measured your sugar content and it is 250 mg%?" The usual reply was, "Of course. Otherwise, hypoglycemia will ensue".

Unfortunately, many diabetics think so. They are very surprised when I recommend them not to eat at once, but a couple of hours later, after the sugar content notably drops.

Many diabetics were unaware of the importance of measuring sugar content before bedtime in order to understand whether it is necessary to eat something to prevent nocturnal hypoglycemia. They also did not know that for the same purpose, it is necessary to prepare, before going to bed, a glass of water sweetened with natural sugar. Maybe it will remain intact one thousand times, but for the 1001st time it will save you at a sharp decrease in blood sugar content.

8. Most of my patients measured their blood sugar content only on an empty stomach and sometimes – before bedtime. However, they could not understand why their HbA1c amounted to 10 or 11% at relatively low sugar content. This obviously shows that they could have high sugar content at any other time because of incorrect regimen of injections and food intake.

Later on, during our *on-line* communication, I taught diabetics to establish the sugar measurements schedule depending on the time of injections and food intake. Looking at their sugar curve with its peaks and depressions, they started to understand the importance of several measurements for efficient compensation.

9. This question clarifies the diabetic's knowledge of the effect of physical activity (walking, physical exercises and work) on the dosage of the administered medicines, especially

insulin. Many of them did not know that long walks require a decreased insulin dose in comparison with the absence of such physical stress. A neglect of this fact can lead to hypoglycemia during the walk.

All of them knew that physical stress was healthy for a diabetic, but only some of them knew that excessive physical stress was harmful.

10. My patients did not even understand the meaning of the term "compensation" and were unaware of various methods to achieve it besides those prescribed by their doctor, whose instructions they blindly followed without understanding their meaning. My experience has shown that as a result of consistent work in *on-line* mode, diabetics can master compensation techniques, which allows decision-making is various unexpected situations.

They visited family doctors about once in 3-4 weeks. If the sugar content remained far from the norm, the doctor suggested either increasing the insulin or tablets dosage, or growing thinner, or else observing a more rigid diet. However, the diabetic was controlling these actions by himself until the next visit, and if he was untrained, such treatment did not give desirable results. In such cases, a visit to an endocrinologist was appointed (usually within 3-6 months, depending on the situation at a given sick-fund). The endocrinologist made key decisions, such as changes in the compensation regimen, prescription of a new type of insulin, etc. However, the efficiency of these visits was rather low, which does not surprise me owing to my view of the compensation process (see (I)).

11. Only a few of my patients were hospitalized because of abnormal diabetes course. These diabetics pointed out that after leaving hospital with an established compensation regimen, after a certain time at home they were unable to recompensate themselves after the regimen violations. In my opinion, the main reason is that diabetics are insufficiently trained in self-regulation technique. Some of them complained that even in case of severe decompensation and high sugar content they were refused hospitalization for a long time and were finally hospitalized with diabetes complications. Nearly all of them pointed out that rather often the personnel maintained their sugar level close to the norm at an amateur level. In grave situations, endocrinologists were invited, but rather unwillingly and mostly on the request of a patient or his relatives.

Having discussed the patient's answers to my question, I suggest him some literature to study various aspects of his disease. If he agrees with my conditions of cooperation, namely, observance of the recommended diet, of the times of blood sugar content measurements, food intake, injections or tablet taking, and of the fixed hours of our communication, we start the compensation process whenever it is convenient for him.

I can make the following conclusions from the results of these meetings:

1. Systematic training of diabetics in the fundamentals of their disease is rather urgent.

2. Advanced training of family doctors is equally urgent. It is clear from their recommendations on diabetes compensation. For instance, I found out that in a number of cases, when switching a diabetic over to insulin, he was not warned about a possible hypoglycemia, insulin doses of 30-40 units were prescribed for the bedtime, a large number of foodstuffs indicated for diabetics were not recommended, etc.

3. Fundamental, several-hour-long meetings of a diabetic with a doctor are very important for further successful treatment. After such meetings, the patient becomes sure of the successful outcome of his treatment due to the understanding of the occurring processes and of the general idea of the treatment.

4. I realize that with the present-day system of medical service, it is impossible to work with diabetics according to my well-grounded recommendations. However, this does not justify the existing system and calls for introduction of basic changes into it.

First of all, it is necessary to establish consulting rooms of diabetes compensation for working with diabetics in *on-line* mode. Positive results of such approach will be evident very soon, within the first several months.

In the following part of this paper I will demonstrate the efficiency of this compensation method by specific examples of my work in *on-line* mode.