DIABETES MELLITUS: instructions for a correct management

The Services of the Departmental Operative Unit of Diabetology and Endocrinology

Dr. Simonetta Lombardi
Taking care of the person in his/her totality: this is the mission of the Local Sanitary Hospital in this historic moment, as part of the regional programme and the previously determined health purposes. This big purpose becomes a daily obligation that should be cultivated with determination and together with the other sanitary professions, with participation of the local institutions and of the citizens.

This charge gets fed by different moments through the cure of the pathologies, but especially through the prevention and the management of the pathologies. Therefore, this booklet full of contents, but easy to read and use, represents a gesture of “obligation” toward the diabetic patient in order to help him/her to live with this disease and to understand its fundamental mechanisms.

Lately, the Ulss 5 Hospital has intensified the effort to communicate to the patients and to the reference community what it has been doing and how it has been doing it to fulful its mission.

This book is an ulterior evidence of that direction and it harmoniously continues the other publications about the alimentation, such as: “How do our children eat? Suggestions to eat well” which was written for the families as part of the health education topic. The volume “Diabetes Mellitus: instructions for a correct management”, published in the languages spoken by the main ethnicities that are present on the territory of Ulss5, is an additional service offered to the patients affected by a pathology that is more and more diffused and therefore it has become not only a sanitary but also a social issue. The Presentation of the Diabetological Service offered by Ulss 5 (presenting the offered service, the office hours of the activities and the operators) has been inserted in order to give more value to the booklet.

We would like to thank sincerely Dr. Simonetta Lombardi and Nurse Sabrina Cozza, the Health Promotion and Education Service and the Cultural Mediation Service of Ulss 5 Hospital that could “form a team” together.

Ave. Daniela Carraro
Head-director Ulss 5
The health education in diabetological field is absolutely fundamental for the management of the diabetic patient. Each diabetologist knows how engaging it is to lavish in this constant, daily work of information, update and strengthening of the main rules that must regulate the life of whom wants to live serenely and as long as possible with the own diabetes.

The duty of those diabetologists and nurses, who must deal with diabetics that speak languages, have got habits, traditions and cultures that are different from their own ones, is even more engaging. Therefore we welcome this nice publication that is the result of the long diabetological experience of Dr. Simonetta Lombardi and of her team of doctors and nurses full of enthusiasm and capability. It constitutes a work instrument that flanks everything that is already done in the educative field at the Diabetological and Endocrinological Departmental Structure of the Uls5 Hospital of the Ovest Vicentino. It is a series of clear instructions for a better management of the disease that accompanies the extracommunitarian patient at home and that may be read and commented together with the whole family, with an advantage to everybody. We say this because what we advise to diabetics in this publication, especially regarding the alimentation and the life style, is what everybody should follow: in fact, diabetics have got only one more good reason to follow these pieces of advice that each of us should follow.

Diabetes Mellitus, according to the latest estimations, will affect more than 300 million people in the world by 2025 and only in Veneto there will be more than 400 thousand people affected by this disease. The entity of these numbers makes us understand how diabetes has become a real sanitary emergency because of the increase of morbidity and mortality it causes.

In this context the structured sanitary education, which this manual makes part of, represents the first step to prevent diabetes or its complications when the disease is present already. Italy and especially Veneto is becoming more and more a multiethnic society. Considering that the frequency of this Syndrome is major in countries in way of development, we can foresee that in our Region, which is affected by immigration from these countries, the prevalence will be superior to what has been expected. That makes it necessary to help this new reality knocking down linguistic barriers through an illustrated manual that is easily consultable and translated into the various languages of the people related to the diabetological ambulatory of the Diabetology and Endocrinology Service of our Hospital.

We would like to underline the importance of a correct alimentation considering that this represents the main support in the prevention and treatment of diabetes.
The term diabetes derives from the Greek word “diabaino” and it means “go through”; the adjective mellitus means “sugared, sweet”.

These terms derive from the observation made by the antique Egyptians that some people despite eating and drinking much lost weight and dehydrated as if everything they had swallowed, would have “gone through” the body without having been absorbed; besides the urine of these people was sweet that’s why later the Latin adjective “mellitus” was used.

**Diabetes Mellitus** is a group of metabolic disorders characterised by the increase of blood glucose (sugar) level: that happens because of the incapability of the organism of using it as an energy source.

Our body is formed by cells each of which has got a precise task, but all of them need energy in order to function. As the combustion of the fuel produces energy that moves the cars, so does the combustion of food produce energy that our organism needs to build, develop and renew its structures, to guarantee vital activities like respiration, blood circulation and to develop any external activity (muscular work).

Food provides energy in the form of carbohydrates (sugars), lipids (fats) and proteins. **Carbohydrates**, which are completely degraded without leaving behind toxic residues, represent the best energy source.

Glucose needs a hormone produced by the pancreas (gland located behind the stomach) in order to penetrate the cells. This hormone is called insulin that works as a key capable of opening the “door” of the cells in order to let sugar in, which later is going to be used.

Without insulin the glucose absorbed by the intestine during meals cannot penetrate the cells of the organism and it accumulates in the blood (hyperglycaemia).
Regarding the absence or the scarce efficiency of insulin we can distinguish various types of diabetes:

**Diabetes Mellitus type 1**
- lack of insulin, it arises suddenly, mainly when young, and it is connected to an autoimmune destruction of the pancreatic cells that produce insulin.

**Diabetes Mellitus type 2**
- insulin is present but it cannot function well, it arises slowly mainly in overweight or obese adults and it is essentially connected to the resistance of the tissues to the action of insulin.

**Other types of diabetes**
- caused by medicines or toxics, genetical defects of the Beta Cell, diseases of the esocrine pancreas, endocrinal diseases.

**Gestational Diabetes**
- insulin is present but it cannot function well, it can arise during pregnancy in predisposed women and regress after delivery.

### Symptoms

**Diabetes type 1**
- weight loss
- fatigue
- intense thirst
- abundant urine
- intense hunger,
- blurred vision
- infections of the bladder, skin and vaginal areas

**Diabetes type 2**
- The symptoms are very subtle compared to type 1; the disease may have been present for many years before the diagnosis, causing serious damages (complications) before its discovery.
If diabetes is not treated adequately, the excessive blood glucose (hyperglycaemia) damages each organ in time. The complications of diabetes involve large vessels (heart, brain, lower extremities) and small vessels (eyes, kidneys), besides they damage the nerves (sympathetic nervous system and autonomic nervous system).

It causes a major risk in each part of the body:

The involvement is variously associated to complications damaging the nerves and vessels of lower extremities that cause an elevated risk of formation of ulcers on feet (DIABETIC FOOT).

These complications progress slowly and they can be prevented or slowed down through an optimal control of diabetes that means having glycaemia possibly next to normality that is:

- Glycaemia on an empty stomach between 80 – 100 mg/dl
- Glycaemia after 2 hours from meal < 140 mg/dl

There is the possibility to avoid chronic complications of diabetes maintaining:

- Glycaemia on an empty stomach between 80 – 120 mg/dl
- Glycaemia after 2 hours from meal 120 – 160 mg/dl
- HbA1c < 7%

Besides the control of glycaemia it is necessary to control and correct:

- Blood pressure (< 130/85 mmHg)
- Total cholesterol (< 200 mg/dl)
- Triglycerides (< 150 mg/dl)
- Abolishment of smoking
- Diet
- Exercise
The therapy of diabetes is based on exercise and healthy alimination. Daily exercise (a 30-minute fast daily walk is enough) contributes to weight loss, it aids the reduction of glycaemia and blood pressure and it helps the heart. Medicines can help but not substitute the effect of diet and exercise.

In case of diabetes mellitus type 2, if diet and exercise are not sufficient, the therapy is represented by oral glucose-lowering medication that lower the concentration of blood glucose through various mechanisms: some slow down the absorption of carbohydrates by the organism (alpha-glucosidase inhibitors), some stimulate the pancreas to produce insulin (sulfonylureas and glinides), some reduce the resistance of the cells to insulin (biguanides). If glucose-lowering medication is not enough to keep diabetes under control, insulin must be administered.

In other words, the therapy of diabetes type 2 can be compared to a “ladder” that needs a base, this base is represented by diet and exercise and from this base we go up the ladder, according to the metabolic necessity of the patient, using the oral glucose-lowering medication in monotherapy and if they are still insufficient to obtain an adequate metabolic control we can use the combined oral therapy and/or the insulin therapy in association with the oral therapy. In special situations such as feverish diseases, surgical interventions, myocardial infarction etc. even in case of patients affected by diabetes type 2, it is necessary to suspend the oral therapy and to use the insulin therapy, and when the emergency is over, the oral therapy may be restarted; this “ladder” of the therapy should not be regarded as an ineluctable procedure toward the use of insulin. In some cases, according to the metabolic necessities and in collaboration with the diabetic patient, this kind of therapy can be followed both upwards and downwards.

In case of diabetes mellitus type 1 when the cells of pancreas are destroyed through the autoimmune mechanism and there is no insulin production, it is necessary to administer it.

In case of gestational diabetes, if diet is not enough, it is necessary to use insulin because the oral glucose-lowering medication is not indicated during pregnancy.
If after having injected insulin or taken glucose-lowering drugs the diabetic skips, postpones or reduces the meal or does excessive physical effort or drinks alcohol on an empty stomach, the blood glucose may lower under the values of normality (in that case we talk about HYPOGLYCAEMIA < 50 mg/dl).

On contrary, if the therapy is inadequate or the patient does not pay attention to the own alimentation or stressful events happen such as diseases, surgical interventions ...., the patient may have an increase of blood glucose (HYPERGLYCAEMIA).

We illustrate both situations shortly.

Pay attention to:

- abundant sweating
- tremors
- palpitations
- hunger
- weakness
- paleness
- difficulty in concentration and reflection
- blurry vision
- change of mood
- somnolence and mental confusion

Causes

- excessive administration of insulin
- scarce alimentation
- late meals
- excessive physical work
- alcohol/medicines

What to do

Consume food or drinks containing sugar for example 3 sugar lumps or half tin of soft drink e.g. orange juice or coca-cola followed by a sandwich, biscuits or one package of crackers or 2 slices of rusk.

Important

If you do not manage to wake up the person, DO NOT give him/her liquids because s/he could suffocate. 1 phial of glucagon can be given by intramuscular injection. Call a doctor or an ambulance.
Pay attention to:
- increased thirst
- increased urine output
- tiredness
- slight illness
- weight loss
- high level of chetons in the urines

Causes
- insufficient insulin dose
- omitted administration of insulin
- dietetic errors
- diseases
- stress
- less exercise than usually

What to do
Analysis of glycaemia in blood: if high, consult your doctor.
Analysis of urines for chetonic bodies: if positive, consult your doctor
Go to a hospital.

It is fundamental to have a correct alimentation when having diabetes mellitus.
An irregular diet makes impossible an adequate metabolic equilibrium.

First of all, we should eliminate equivocques: following a diet does not mean that you should undergo a torture eating tasteless food!!!
It is possible to eat tasty and various meals avoiding the excesses, but most of all it is necessary that the diabetic patients know the characteristics of food.

There are three types of food:

Carbohydrates
- simple sugars common sugar, honey, sweets, etc.
- complex sugars bread, pasta, rice, potato, couscous and flour

Proteins
- animal fish, meat
- vegetal pulses

Fats
- animal butter, bacon ....
- vegetal olive oil, maize oil, sunflower-seed oil, palm-oil, etc.
Carbohydrates are a very good energy source (1g = 4 Kcal) and the complex ones represent a basic element for a balanced diet. In case of a diabetic pathology simple carbohydrates should be avoided. These are common sugar, honey, marmalades, cakes, cookies, ice cream, pudding, sweets ... that are absorbed rapidly from the intestine; they get rapidly into circulation causing hyperglycaemia. Complex carbohydrates are privileged because they are absorbed slower causing minor hyperglycaemic peaks.

Fats are a potent energy source and, equally to their weight, they give more calories than sugars or proteins (1 g = 9 Kcal). However, they are not completely degraded and they leave behind residues in the form of chetonic bodies. Fats consumed excessively accumulate in the adipose tissue and in blood in the form of triglycerides and cholesterol. The increase of cholesterol in blood tempts to deposit in the arteries, so this should be avoided in order to prevent arteriosclerosis.

Proteins are the “bricks” that our organism uses to renew the muscles, the bones and other tissues. They are not used for energetic purpose unless in emergency (1 g = 4 Kcal). A balanced diet should contain:
- proteins of animal origin (meat and fish)
- proteins of vegetal origin (pulses)

It is important to know that much of the food we normally consume is “mixed”.

Some examples:
- milk contains both sugars and fats;
- cheese contains proteins but also many fats;
- fresh fruit contains fibres but also simple sugars;
- sweets contain much sugar and fats;
- pulses contain complex sugars but also proteins and fibres.

In conclusion REMEMBER:

• a diabetic may eat anything avoiding simple sugars except fruit (but moderately)
• bread, pasta, rice, potato, maize porridge may be consumed according to the rule “only one type of carbohydrate per each meal and always associated with vegetables that contain fibres that slow down the absorption”
• food should be consumed moderately and respecting the correct proportions
• a balanced diet should contain:
  - an abundant quantity of vegetables (fibres)
  - a good quantity of complex carbohydrates that absorb slowly (bread or pasta or rice or maize porridge)
  - a discreet quantity of proteins (fish, meat, pulses)
  - a scarce quantity of fats
• alcohol is not food even if it produces 7 Kcal/g; it is “empty energy” of no utility for the organism, on the contrary it allows the accumulation of fats.

Fibres can be found in vegetables, pulses and in whole wheat. They are healthy because they slow down the absorption of sugars and fats.
**The choice of food**

Some pieces of advice in order to make the right choice

**Milk and dairy products**
It is advisable to use skimmed milk and low-fatted yoghurt.

**Cheese**
Not more than once a week.
It is preferable to consume low-fatted cheese, not fermented ones (like yocca, curds, mozzarella).

**Eggs**
Their consumption is very important, but it should not be superior to 2 eggs per week, preferably boiled, poached or hard-boiled, eventually scrambled limiting the condiments for the cooking.

**Salamis**
Not more than once a week.
The consumption should be possibly limited to lean cooked/cured ham and bresaola.

**Fish**
At least 3 times a week.
Fresh or frozen is a very good food, rich of proteins. It is preferable grilled, boiled or roasted, excluding the molluscs, salmon, eel, fish in oil, tinned fish (exception tuna without oil). Besides proteins, fish contains polyunsaturated fats that lower the level of cholesterol.

**Meat**
Not more than 2 – 3 times a week.
Beef, veal, chicken, turkey, rabbit, lean pork, horse. It is preferable grilled, boiled or roasted, not breaded.

**Floury**
Rice, pasta, bread, maize porridge and potatoes are types of food rich of sugars; their use should be controlled and not associated among them in the same meal. It is preferable the common or whole-wheat bread to rusk or breadsticks.

Potatoes should be consumed less possible because they cause excessively fast increase of glycaemia.

**Vegetables**
All vegetables may be consumed freely during the day. Remember that potatoes are not considered vegetables but carbohydrates.

**Pulses**
Pulses (beans, peas, lentils, broad-bean, chick-peas) may be consumed instead of bread or pasta.
• Keeping under control your weight and the circumference of your waist (maximum 88 cm in case of women and 102 cm in case of men) is the first step to cure diabetes. The circumference of your waist expresses the level of visceral fat accumulation that is unanimously considered the main risk factor for cardiovascular diseases. Therefore, if you are overweight, you should pass to a balanced alimentary programme controlling the quantity and quality of food.

• Avoid all types of sweets including the “ones of whole-wheat and those for diabetics”, the latter contain excessive sugar and fats anyway.

• Consume only one type of complex carbohydrate per meal.

• Vegetables in every meal.

• Meat (lean) 2 – 3 times a week.

• Fish at least 3 times a week.

• Cheese not more than once a week.

• Fresh fruit twice a day.

• Use olive oil as condiment but within limited quantities.

• Drink preferably water; it is allowed to drink half glass of wine per meal but remember that wine, beer, digestives, aperitifs, bitters contain lots of calories and they do not calm hunger.

• Never drink alcohol on an empty stomach

• Have “fractioned” meals (do not exceed the daily caloric quantities): breakfast, half morning, lunch, half afternoon, dinner, and a snack before going to bed controlling the quantity of the portions; this allows to reduce the feeling of sudden hunger and improves the glycaemia.

• Daily exercise is important: a walk, a ride by bicycle or fitness cycle; it is important to do at least 30 minutes exercise every day.
The Departmental Operative Unit of Diabetology and Endocrinology assures the diagnosis and the therapy of the diabetic disease and its complications, the metabolic diseases and the endocrinal diseases. It also guarantees information, education and prevention regarding metabolic and endocrinal diseases.

The activity of the Operative Unit is oriented toward the collaboration with the General Practitioner.

The purposes of the Operative Unit are oriented to guarantee the:
- technical quality of the services;
- organising quality;
- rights and satisfaction of the consumers and the operators;
- right use of the resources.

The Departmental Operative Unit of Diabetology and Endocrinology is an integral part of the Department of Medicine. It operates on the whole territory of ULSS 5 and it has got its headquarters at the Hospital of Montecchio Maggiore and two other offices at the Hospital of Valdagno and Lonigo.

The operative Unit is open to the public:

- in Montecchio Maggiore from Monday to Friday from 8,00 to 13,00; from 13,30 to 16,00
- in Valdagno on Mondays and Thursdays from 8,00 to 13,00 and from 13,30 to 16,00 on Tuesdays, Wednesdays and Fridays from 8,00 to 13,00
- in Lonigo on Tuesdays from 8,00 to 13,30

The Services

**The Departmental Operative Unit of Diabetology and Endocrinology**
Director Dr. Simonetta Lombardi

**Appointments**
The appointments for the diabetological (ambulatory of Lonigo), endocrinological examinations, for the thyroidal ultrasound with Colour Doppler Scanner and for the release/renewal of the driving licence of diabetic patients are fixed at the CUP (Unique Centre for Appointments). You can go there in person with the referral of your Family Doctor from 7,45 to 13,00 and from 14,00 to 17,30, or you can call the free number 800212525 from 8,00 to 17,00 (continuous office hours) from Monday to Friday.

The appointments for the first diabetological examinations (ambulatory of Montecchio Maggiore and Valdagno) are fixed directly through the personnel of the operative Unit from Monday to Friday from 8,00 to 13,00 and from 13,30 to 15,30 or you can call 0444 708124 Montecchio Maggiore, 0445 423329 Valdagno.

The appointments for the diabetological check-ups and for the eco-guided fine needle aspiration of the thyroid are fixed directly through the personnel of the operative Unit at the end of the specialist examination.

**First examination** the nurse receives the patient, fills in the case-record, examines the sanitary documentation and sends the patient to the specialist of the Service that examines him/her, effectuates the screening of the complications, plans the therapy of the case and the follow-up.

**Check-ups** are performed, except in special cases, every 2-3 months in case of diabetes type 1, every 4 months or according to protocols concurred with the doctor in case of diabetes type 2 and diversified ones on request of the doctor in case of endocrinal and metabolic pathologies different from diabetes.

**Urgencies** the patients with an urgent request of their doctor can go to the Service after having passed the First Aid Post.
Access and services

The consumers that accede the Operative Unit for the first time are received by the nurse who after having carried out the administrative documentation by writing the personal data in the case-record, performs an examination that consists in measuring height, weight, abdominal circumference, blood pressure and s/he examines the documentation (for diabetology and endocrinology). Then the patient is sent to the doctor of the Operative Unit in order to undergo a specialistic examination and to receive a personalised dietetic and therapeutic education.

The follow-ups are decided by the specialist and/or by the family doctor on the evidence of the glycometabolic equilibrium (regarding the diabetic disease), and by the family doctor, according to the follow-up previously determined by the specialist, in case of endocrinical diseases. The examination performed by the nurse is identical to the 1st access, on request of the specialist the randomised glucagon and glucotest are performed.

The medical-nurse Team organises meetings in small groups for therapeutic education regarding the diabetic disease. The meetings are about correct alimentation, administration of insulin, auto control of glycaemias performed at home, correct use of reflectometers and hygiene of feet.

The following examinations are performed once a year: check-up of the ocular bottom, electrocardiogram, test of Winsor (performed by diabetologist-endocrinologists), electromyography (in case of symptoms or pathologic signs), arterial Doppler ultrasound of TSA and of the lower limbs (in case of symptoms or pathologic signs).

The Operative Unit also releases or renews driving licences (A,B) for diabetic patients, receives patients in precarious metabolic conditions, who need intensive therapy, in the ambulatory of the urgencies in order to avoid indispensable hospitalisations.

The endocrinological activity, besides the endocrinological specialised examination, prescribes the performance of thyroidal and parathyroidal ultrasound with integrative doppler ultrasound and eco-guided fine needle aspiration in the diagnostic part.

Activity of the Diabetological and Endocrinological Service

Diabetological Service
Diabetological ambulatory
Ambulatory for the diagnosis and cure of the diabetic foot
Ambulatory for gestational diabetes
Ambulatory for the diagnosis and treatment of dislipidemia
Ambulatory for the release/renewal of the driving licence of diabetic patients
Sanitary education individually or in small groups

Endocrinological Service
Endocrinological Ambulatory
Ambulatory for thyroidal and parathyroidal ultrasounds
Ambulatory for thyroidal and parathyroidal eco-guided fine needle aspiration

Each patient receives a letter to the family doctor at the end of the examination. Each date is registered in the case-record that is kept in the archive.

Consultancy over the phone

The personnel of the Service may be contacted by phone for clinical advice or therapeutic adjustments from Monday to Friday from 8,00 to 13,00 and from 13,30 to 15,30 at the following number:
  • Montecchio Maggiore 0444 708124
  • Valdagno 0445 423329

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