



# DiabetesWatch

A publication of the PHILIPPINE DIABETES ASSOCIATION, INC. for the Filipino diabetic patient

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## *Trends in the Treatment of Diabetes:*

### **Home Blood Glucose Monitoring (HBGM) . . . or, do your own blood sugar testing at home!**

*"Since 1977, I have traded urine sugar testing techniques for blood glucose strips and a blood glucose reflectance meter. This seemed necessary when I became aware (thanks to a good diabetes specialist) of my high renal threshold for glucose. With four blood glucose tests a day, I can vary my dose of short and/or intermediate acting insulins according to my actual needs."*

Although insulin has been available since 1922, clinicians still do not fully agree on certain aspects of treatment for diabetics — specially in regard to 'tight' (always normal) versus 'loose' (mostly normal) glucose\* control. Adding to the controversy, has been the development of new treatment options like the portable insulin pump, and the development of monitoring techniques whereby the patient tests his own blood sugar (blood glucose self-monitoring).

The most important unresolved question in the management of patients with diabetes is the relationship, if any, between the development of microvascular complications (those involving the small blood vessels of the eyes and the kidneys which in the end cause blindness or renal failure) and neuropathic complications (those involving the nerves) against the regulation of the blood sugar. One of the leading diabetes specialists, Dr. Peterson, and his colleagues, showed that a program of exercise, proper diet, and home blood glucose monitoring (HBGM) with self-adjustments of insulin doses provided markedly improved blood glucose control which was similar to that achieved by the use of the insulin pump. Some investigators relate such good blood glucose control to a significant reduction in blood pressure and in the lessening of the thickness of the walls of the very small blood vessels (basement membrane of the capillaries)

which lead to the microvascular complications of diabetes. Toeller, a German physician, showed that other indices of diabetes control, such as the average blood glucose values before breakfast, the 'glycosylated hemoglobin' (which will be described later), and the serum cholesterol levels all improved when the patients did self-monitoring.

Management of diabetes can be described as conventional or intensive. In the conventional management, the patient receives one or two injections of intermediate acting insulin alone, or combined with short acting insulin. Urine glucose concentrations are measured at home by the patient, and the physician measures the blood glucose levels in the fasting state, or randomly during office visits. Alterations in therapy are made, based on the urine glucose pattern and the blood glucose levels.

In contrast, the intensive management, blood glucose control is achieved by self-monitoring of blood glucose by the patient at home, along with adjustments of the daily insulin doses based on guidelines established by the physician according to the blood glucose patterns and values drawn at the office visit. The aim is to achieve a glucose profile similar to that in the non-diabetic.

In the late 1970's, was developed a method by which diabetic patients could monitor their own blood glucose levels.

Determining blood sugar levels at home is not complicated, but requires a capable and motivated patient. At intervals throughout the day, the

patient pricks his finger or earlobe and with the blood obtained, he places this on a reagent treated strip (Haemoglukotest or Visidex) and reads the blood sugar value comparing it to a color chart or with the aid of a reflectance meter (Dextrometer or Reflomat unit).

Diabetologists disagree as to the optimum frequency with which blood glucose readings should be taken. Some recommend 7 or 8 determinations per day. Others believe a full profile of before and after meal determinations one day a week or several days per month to be adequate. A more practicable schedule is four blood glucose determinations per day consisting of readings before breakfast, before lunch, before dinner and before bedtime. This will provide adequate information to adjust insulin dosage. Once the desired level is achieved, the number of daily blood glucose determinations can be reduced. Some patients however continue with several determinations per day — maybe because they are psychologically reassured if they knew their blood sugar levels are normal. Doing the blood glucose determinations is not enough. The patient must also be aware of the target goals for optimal blood glucose control, glucose levels that indicate the need for a change in insulin dose and of how to select and adjust insulin daily. The ideal range of fasting blood glucose levels is 80-110 mg% (4.4-6.1 mmol/L). Most often, each insulin injection is a combination of short and intermediate-acting insulins.

In addition to the patient's daily glucose monitoring, the physician can confirm the blood glucose patterns by measuring glycosylated hemoglobin (HbA1c). This test provides an index of blood glucose over the previous 4 to 6 weeks. Glycosylated hemoglobin readings can serve as a double check on patients who may not be using the correct technique, on patients who may not be reporting honest glucose readings to the physician or on patients who have widely erratic fluctuations in blood glucose that even self-monitoring may be difficult to detect.

(Continued on page 3)

\*Glucose is the specific sugar in the blood that we are concerned with in the diabetic. In this article, glucose and sugar are used interchangeably.

Are you a newly discovered diabetic and will start taking oral diabetes medications or are you a known diabetic on an oral antidiabetic drug and will take another drug for another disease you are suffering from? If so, STOP, do not take these medications immediately! First LOOK at the composition or active principles of any drug or drugs you are presently taking and will start to take and consult your doctor. LISTEN to his advice carefully because two or more drugs taken at the same time might act together in an unwanted way, in a process called drug interaction.

Because you have diabetes, you have a special responsibility to know what a drug does inside your body. On their own, or because of interactions, many medications can raise or lower your blood sugar. We will give you a list of major drugs known to affect diabetes control but it cannot say how you will react to any of them. They will disturb diabetic control for some people, yet affect others only slightly or not at all. Even if a medication does affect your blood sugar, you can still take it if you really need it but consult your physician as often as necessary so that together you can work out a plan wherein you can take your medications without disturbing your overall diabetes management plan.

In the following list, the general name of a drug or class of drugs is given first, followed in parenthesis by one or more of the popular brand names. Drugs that are italicized can raise or lower blood sugar severely. If you are using oral antidiabetic drugs, take note of the drugs marked by asterisk (\*). When these drugs and diabetes pills are taken together, the diabetes medicines can cause blood sugar to fall even further. It is important to recognize, that the interaction may work both ways so that interaction between sulfonylureas and dicoumarol may decrease the anticoagulant (anti-clotting) activity of dicoumarol.

#### Drugs That Increase Blood Sugar

**CORTICOSTEROIDS** (Prednisone, Decadron, Cortisone). Most commonly used to relieve inflammation, redness, irritation and swelling. Prescribed for variety of illnesses including asthma, arthritis and allergic reactions.

**DIAZOXIDE** (Hyperstat) a powerful hyperglycemic agent used to treat low blood sugar caused by insulin producing tumors but is used also to treat high blood pressure.

## STOP! LOOK! LISTEN!

### Your medicines for diabetes may be in conflict with other drugs

**DIURETICS** used to relieve water build-up by increasing the amount of water passed thru the urine. Often used to treat high blood pressure and congestive heart failure. The thiazide diuretics (Dichlotride, Hygroton, Moduretic) generally have the strongest effect on blood sugar but other kinds like furosemide (Lasix, Frusema, Marsemide, Diurema) can also raise blood sugar.

**EPINEPHRINE, ADRENALINE.** Used for treating asthma and allergic reactions (ex. bee sting). Similar compounds are used as decongestants in cold remedies.

**ESTROGEN, BIRTH CONTROL PILLS:** (Sold under several brand names). Used to control pregnancy and also lessen the effects of menopause.

**NICOTINIC ACID, NIACIN:** In large doses sometimes used to treat high cholesterol levels. Since it is a B vitamin, niacin is also sold over the counter as a nutrition supplement. Large doses can raise blood sugar.

**PHENOBARBITAL:** Used as a sedative or sleeping pill and sometimes for treating epilepsy. It raises blood sugar only in people who use the sulfonylurea drugs.

**PHENYTOIN** (Dilantin): Often used in treating epilepsy and other nervous system disorders. It does not raise blood sugar in all diabetics but can have a strong effect in some.

**PROPRANOLOL** (Inderal): In most diabetics, this drug lowers blood sugar, but in a few people it can have the opposite effect.

**RIFAMPIN** (Rifadin): Used in treating tuberculosis. It raises blood sugar only in people who use the sulfonylureas, especially tolbutamide (Rastinon).

**THYROID PREPARATIONS**, including desiccated thyroid. Used by people who do not produce enough thyroid hormones or who have had their thyroid glands removed surgically or by radioactive iodine. Also used to make non-toxic goiters smaller.

#### Drugs That Decrease Blood Glucose

**CHLORAMPHENICOL** (Chloromycetin)\* lowers blood sugar in some who are taking the sulfonylurea drugs.

**COUMARINE ANTICOAGULANTS**

(Dicumarol). \* Used to prevent clotting of blood most often for heart attack patients. It lowers blood sugar only in people taking the sulfonylureas.

**METHYLDOPA** (Aldomet). \* Used for hypertension. It lowers blood sugar in those taking the sulfonylureas especially tolbutamide.

**MONOAMINE OXIDASE INHIBITORS** (Parmate, Nardil, Eutonyl). \* Used to combat severe depression. They are seldom prescribed because of many possible side effects. In addition to lowering blood sugar, they interact strongly with aged foods including certain wines and cheeses.

**PHENYLBUTAZONE** (Butazolidin, Butacote). \* An anti-inflammatory drug used in treating arthritis. It lowers blood sugar only in those who use the sulfonylurea drugs especially chlorpropamide (Diabinese).

**PROPRANOLOL** (Inderal). Used in treating angina (chest pain from heart ailments), unsteady heart beats and overactive thyroid glands. Not only can it lower blood sugar but also prevent the symptoms (sweating, shakiness) that ordinarily let diabetics know their blood sugar is too low. Similar drugs are now being used like metoprolol (Betacoc) and Timolol (Blocarden) that appear to be safer for diabetics.

**SULFA DRUGS** (Gantrisin, Septra, Bactrim). \* Used for treating infections. They are chemically similar to sulfonylurea so when taken with these drugs can cause significant fall in blood sugar.

#### "Over-the-Counter" and "Under-the-Table" Drugs

Like prescription drugs, "over-the-counter" and "recreational" drugs can have unwanted effects, and they can sometimes interact with each other or with prescription drugs. And because you can buy these on your own, you must take extra care to use them wisely.

**ALCOHOL** can do different things to different people. Its main danger in diabetics is a severe, possibly fatal, fall in blood sugar levels when taken on an empty stomach. This tends to be worse in those taking insulin and oral diabetes medicines than in those whose diabetes is diet-controlled. Alcohol can have

exactly the opposite effect — increasing blood sugar — in individuals who drink large amounts over a long period of time. The increase is due to the additional calories in these and in chronic alcoholics maybe caused by liver damage.

**ASPIRIN:** The amount of aspirin ordinarily taken for headache or temporary fever may not be a cause for concern but the amount taken to control chronic pain may lower blood sugar significantly especially if oral antidiabetic medications are taken.

**COLD REMEDIES AND DIET PILLS:** Many of these medications contain epinephrine-like compounds like ephedrine, pseudoephedrine, phenylephedrine, phenylpropanolamine (Acedel, Allerest, Allerin, Atussin, Corex, Sudafed, etc.) which can increase blood sugar (and also blood pressure) in some diabetics. These drugs can make you feel as if you are having insulin reactions when you are not.

**MARIJUANA:** This does not raise blood sugar directly but causes a craving for sweets in many who use it. Giving in to this craving can raise blood sugar.

**SUGARY MEDICATIONS:** Most cough syrups and lozenges are almost

entirely sugar and often taken during an illness when blood sugar tends to be high already. When needed, a sugarless version of your medication may be used instead.

**TOBACCO** according to some researchers can raise blood sugar but more studies have to be done. More important would be the untoward effects of smoking to a diabetic patient's compromised blood vessels of the heart, brain and extremities.

Our advice to you then is "Don't rely entirely on others to keep you safe. The better you understand the medications you take, the safer you will be." — A.V.C.

*(HBGM... continued from p. 1)*

Who should be encouraged to do HBGM? Approximately all insulin-dependent patients (IDDM), including newly diagnosed patients should be encouraged to self monitor. Pregnant diabetics or diabetics planning to get HBGM because better blood glucose control reduces the chances of congenital malformations as well as, fetal and maternal morbidity. Children and ado-

lescents with IDDM should do HBGM as better physical growth and development can be achieved through tighter glucose control. Brittle or labile patients who have recurrent hypoglycemia or recurrent ketoacidosis should also be encouraged to do HBGM.

There are some patients where tight blood glucose control will probably not affect the outcome of their disease and therefore not candidates for HBGM and intensive therapy. These are those patients with a limited life expectancy because of advanced age or intercurrent disease, patients with end-stage renal disease and patients who are unlikely to adhere to the program because of psychological problems such as depression.

One of the psychological benefits of HBGM is that it allows diabetics to cope better with their disease by increasing their awareness of its management and consequently making them feel more secure. Home blood glucose monitoring in no way renders the doctor superfluous; but it can serve to form a supplement to and/or become part of a system of intensive medical care. Once accepted, HBGM can achieve excellent results. — M.A.L.-A.

**Talking about Diabetes**

Talking about diabetes is an educational programme aimed at diabetics in hospital and general practice who are treated by: a diet alone a diet and oral drugs, a diet and insulin therapy. It is also aimed at the patient's relatives who assist them in their monitoring activities.

Diabetes mellitus is one of the very few diseases whose successful management and control largely depend on the patient's willingness to become involved in his own treatment. It is not possible to avoid acute complications, such as coma and hypoglycemia, or late sequelae by means of optimal glycaemic control if the patient is unwilling to comply.

This naturally presupposes, however, that the diabetic has the necessary knowledge and experience about managing his disease.

BM's slogan for the Diabetes Educational Programme: "Working together towards the goal of effective diabetic control."

Patients need to be able to exchange opinions and discuss problems with his physician and other diabetics. By taking part in Boehringer Mannheim's Diabetes Educational Programme, the diabetic can learn progressively more about his disease so that:

- he is sufficiently knowledgeable about his condition and about possible acute and late complications and can understand the need for the therapy prescribed by his physician and its purposes;
- he can follow his physician's instructions responsibly and professionally;
- he can pursue the basic therapeutic goals agreed with the physician and agreeing on further measures;
- he can recognize in good time any complications arising during the treatment and act appropriately;
- he can adjust his life-style to his disease and come to terms with his environment.

For precise details on Boehringer Mannheim's Diabetes Educational Programme contact BM Office Room 406 4th Floor, Mary Marman Bldg., Washington St., Makati, Metro Manila, Tel. Nos. 88-87-31 loc. 224 and 213.

## DiabetesWatch



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## Your QUESTIONS / Our ANSWERS

**Q. What is the present thinking towards the value of urine sugar testing for the control of diabetes? — its limitations?**

**A. Urine sugar or glucose testing has always been a gross approximation technique, and is often not an accurate reflection of the blood sugar glucose levels for the following reasons:**

**1. Differences among patients in the renal threshold for glucose:**

The kidneys — which form the urine — can be compared to a dam holding back normal amounts of glucose in the blood. Normally, if the blood glucose or sugar rises above 170 to 180 mg% (9.4 to 10.0 mmol/L), the glucose spills over the dam and becomes present in the urine. Sometimes, the setting of the level of the dam (renal threshold) is above the normal 170 to 180 mg%, the urine is negative for sugar even if the blood sugar is very high. This is what happens in the older diabetic or in diabetics with kidney disease. Also, the level of the dam may be set at lower than 170 mg%, in which case the urine becomes positive even if the blood sugar were not that high, as what happens in the pregnant woman. Thus, the urine values may not accurately

differentiate the true blood glucose levels in some patients.

**2. Variable lengths of time in which urine accumulates in the urinary bladder before it is voided:**

In some conditions, urine may accumulate in the bladder over a long period of time before a patient feels the urge to urinate. Thus, the urine represents a cumulative period of variable duration which does not coincide with the time point at which we are interested in the blood sugar level. This happens in patients with complications in the control of their urinary bladder function.

**3. Non-specific quantitative measures used to determine the urine sugar values:**

There are tests for urine sugar which are not specific for glucose. Thus, Benedict's solution and Clinistix tablets measure reducing substances not glucose. Other sugars, such as fructose, galactose and lactose — which we are not concerned with in diabetes control — will give positive readings. Positive results (and these are called, 'false' because they do not arise from the presence of glucose) can be obtained when patients are on aspirin, ascorbic acid, the anti-TB drug INH, and on certain antibiotics such as cephalosporins, chloramphenicol, penicillin, or such other drugs as nalidixic acid, 1-DOPA, methyldopa, etc.

Clinistix, Diastix, TesTape, Diabur-800 are the tests specific for urine glucose. — (M.A.L.-A.)

## IN THE NEWS

**IDF-WPR**

The International Diabetes Federation (IDF) has regionalized following WHO groupings. The Philippines is under the Western Pacific Region (WPR) together with Japan, Australia, South Korea, Malaysia, New Zealand and Singapore. The seat of the regional council is in Kobe, with Dr. K. Kosaka as chairman and Dr. S. Baba as secretary-general. Decision-making is now made not from one source in the IDF headquarters, but rather from representatives world-wide.

**Publications**

The Western Pacific Region Council publishes the newsletter, "Diabetes Today" and the scientific journal, "Diabetes Research and Clinical Practice." Copies of both publications are in the offices of the Philippine Diabetes Association (PDA) at the Lung Center of the Philippines.

**Donation**

A check for P1,000.00 was received with gratitude from Rev. John Montenegro of the Society of Jesus to further the activities of the PDA. May his tribe increase!

**PDA Plans**

The Board of Directors of the PDA has set its eyes on two projects: a Diabetes Week in December and a long-term project that may give rise to a Diabetes Center for the country in the future.

**Insulin by Nasal Spray?**

A hope for diabetes in the near future could be the near-availability of insulin administered by nasal spray. This subject will be discussed in the next issue of DiabetesWatch.

**IDF Congress**

The XII Congress of the IDF will be held in Madrid, Spain on September 23-28 this year. The President of the PDA has been invited to speak in one of the panels.

**3rd Congress of AFES**

The 3rd Congress of the ASEAN Federation of Endocrine Societies (AFES) will be held in Kuala Lumpur, Malaysia on December 1-6, 1985. A pre-congress course, "Diabetes for the Practicing Physician" and a lay program are among the highlights of the Congress. The 4th Congress may be held in Manila in 1987.

**Educational Aids**

Hoechst Philippines has donated some educational materials which are available to PDA members at the PDA offices. For the meantime, the PDA offices are open only from 1 to 5 in the afternoon with Ms. Norma del Rosario as secretary. The furnishings of the PDA offices, by the way, were donated by MedAsia, Inc.

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