More Than Meets The Eye
Diabetic Retinopathy and its implications

Bittergourd Juice
Does it lower blood sugar?

Mr Bean Comes To Dinner
Have a ball with legumes

Diabetes Treatment
The fast, the slow & the new

INSULIN & MEDICATION
Bringing Hope & Renewal
Keep a look out for the risk factors of heart disease and stroke

- Male > 55 years
- Female > 65 years
- Obesity
  - BMI ≥ 27.5 kg/m²
- Previous stroke
- Smoking
- Physical inactivity
- Diabetes mellitus
- Family history of premature cardiovascular disease
- High blood cholesterol
  - Total cholesterol > 6.2 mmol/L
  - HDL cholesterol < 1.0 mmol/L
  - LDL cholesterol > 4.1 mmol/L
- High blood pressure
  - Systolic ≥ 140mmHg
  - Diastolic ≥ 90mmHg
Contents
Of Pills, Needles and the Puff

This is no article on drug junkies. It is about the treatment of diabetes. Prior to 1922, being diagnosed with diabetes was like being sentenced to a slow death. Banting and Best managed to produce insulin, earning themselves the Nobel Prize but, more importantly, saving the lives of millions. The development of “diabetic pills” (Oral Hypoglycaemics or OHGs) followed. A major resistance to the use of insulin compared to the pill is the need for patients to inject themselves repeatedly. Recently, the use of inhalable insulin was approved by the Food and Drug Administration.

I suspect most diabetics would prefer a discrete puff rather than a jab if precision in dose delivery is not an issue. A relatively common problem with insulin or use of the pill is hypoglycaemia or low blood sugar. Frequent hypoglycaemia can cause some permanent neurological damage and also worsening of diabetes control with wide swings in the blood sugar level (the “Somogyi” effect).

This brings to mind, what I had thought was a defining moment in my career as a house officer (a “short” while ago). An elderly man was rushed to the medical ward seemingly in deep coma. He could not be aroused despite the frantic efforts of family members. As a newly minted still-wet-behind-the-ears doctor, I found out that he had diabetes and realised that he was in hypoglycaemic (low blood sugar) coma. I confidently gave him an injection of glucose, then strode away, extremely pleased. The relatives were, let’s just say, awed by the quick “resurrection”. Not long after, however, my “humanness” was reaffirmed yet again when I stood helpless before a wheelchair-bound diabetic who begged me to save his brain-dead cyclist son. “Take any part of my body,” he cried, “just save my son!”

Those words still haunt me. The two incidents involved people with diabetes and their family. There is a confusing array of diabetes drugs available today. If you are somehow confused by terms like Lente Insulin, Ultralente Insulin, Humalog, Novolog, Humalin, Novolin, Tolbutamide, Chlorpropamide, Glyburide and Glipizide, you are not alone. We hope this issue will extend a helping hand – to involve diabetics and their families in the daily spectra of diabetes treatment and any potential side effects. Read on!

Dr Yeo Kim Teck
Editor, Diabetes Singapore
Senior Consultant
Singapore National Eye Centre
Diabetes is a common condition in which blood sugar levels are high. The reason is that the production of the hormone insulin is inadequate. Another reason is that the cells fail to respond to insulin. Diabetes is particularly common in older people and can affect up to 25% of them.

In Singapore 10% of our population have diabetes. Most Singaporeans suffer from type 2 diabetes. An important aspect of diabetes management is the control of blood sugar levels with medication or with insulin. It is important to understand the role of insulin and how the various oral medications work.

Diabetic treatment is not limited to just the control of blood sugar. Management includes the treatment of high blood pressure and elevated cholesterol, and preventing stroke, heart troubles, blindness and the amputation of limbs.

Good management must include education on dieting especially when the patient is overweight, exercise, medication and frequent monitoring of blood sugar levels. Good education should also promote an understanding of the most important complication of treatment – hypoglycaemia (low blood sugar).

The important cause of type 2 diabetes is being overweight (obesity) – eating too much and exercising too little. As such, diet control is important.

However, in many patients, diet and exercise alone are inadequate to lower blood sugar levels, in which case, medications become essential.

Oral anti-hyperglycaemic drugs are frequently used to treat patients with type 2 diabetes. These include biguanides, sulfonylureas, meglitinides, thiazolidinediones and glucosidase inhibitors.

Sometimes the doctor has to combine two or more of these oral medications. These drugs work by stimulating the pancreas to produce more insulin. Others increase the body’s response to the insulin produced yet others block the intestine from absorbing the sugar.

In insulin for type 2 diabetes is given if oral drugs are unable to control blood sugar levels. In some countries, half of the patients with type 2 diabetes eventually require insulin. There are four basic types of insulin in use:

1. Rapid-acting insulin: The fastest and shortest acting. Its maximum effect is 60 minutes and it lasts for three hours.
2. Short-acting insulin: Its maximum effect is three hours and it lasts for seven hours.
3. Intermediate-acting insulin: It starts in three hours, the maximum effect is eight hours and it works for 24 hours.
4. Long-acting insulin: It lasts for over 24 hours. The maximum effect is 18 hours.

Glargine, which is different from the other long-acting insulin, continues to have the same level of effectiveness throughout the day and has become a useful insulin.

These four types of insulin can be taken in a variety of ways and in a variety of combinations depending on the need of the individual patient. They can sometimes be combined with oral medications.

It is essential to understand that the objective of treatment is to maintain a normal level of blood sugar. It is also essential to understand that the blood sugar level would vary depending on the food eaten, on the exercise regime, on the stress level and on co-existing illnesses. All these factors may mean a variation of insulin.
Monitoring of blood sugar is essential as the blood sugar level changes by the hour. There must be a combination of diet, exercise and a record of blood sugar levels. Patients have to learn how to do that in consultation with the nurse, the health team or general practitioners. Patient education, diet and exercise are essential elements of drug therapy.

Lastly, an important danger of treatment especially with insulin is the development of hypoglycaemia (low blood level). If the blood level is too low; it is dangerous as the patient can go into coma and may even die.

Hypoglycaemia is a common complication with insulin injection. Sometimes, it occurs with sulphonylureas, especially glyburide and glipizide.

Other oral medications do not usually cause hypoglycaemia. Common symptoms include sweating, nausea, feeling warm, anxiety, shakiness, palpitations, hunger, headache, blurred or double vision, confusion and difficulty speaking, and these patients can be mistaken for taking alcohol as the symptoms are similar.

When the blood sugar level is too low, the patient may faint, develop stroke, go into coma or even die. Treatment then becomes urgent.

In conclusion, type 2 diabetes has become common. The good thing is with new oral medications and different types of insulin, most patients with diabetes can have their blood sugar under good control. The degree of control over a period of three months can be measured with a blood test known as haemoglobin A1C. Ideally this should be at 6%, but 7% is acceptable. Any level over 8% indicates poor control.

The main objective of maintaining normal blood sugar levels is to prevent serious health complications. There is evidence that complications can be prevented and even if they develop, the progress can be slowed or even prevented from further development with proper control of blood sugar.

I wish to emphasise that one of the main problems in non-compliance – the patient does not follow the doctor’s instructions. This is mainly due to the lack of education.

One of the essential functions of the Diabetic Society of Singapore is to explain the condition to the patient and his relatives so that they have a better grasp of diabetes and its control. In this way, the patient will be more committed to controlling his own blood sugar.

We hope to build a good and strong group of educators who can function as trained nurses or lay people who are willing to volunteer to help by patiently and repeatedly explaining to patients the importance of maintaining normal blood sugar levels.

Prof Arthur Lim, MD (Hon), FRCS
Patron, Diabetic Society of Singapore
Batam Bargains

We had the opportunity to visit Batam, Indonesia, with our family and friends for a fruitful one-day tour to revitalise ourselves. It was a much sought after personal trip for seafood lovers, shopaholics hungry for a good bargain and those who just wanted to get away from the hustle and bustle of city life.

The tour started off with a visit to the keropok shop where we were met with shoving elbows and baskets by other shoppers eager for a crack at the snacks and foodstuff. Thankfully unscathed, we left quite hurriedly to visit the Polo Ralph Lauren warehouse where the legendary polo tees were going for a song at just S$18.

But the best catch of the day was a sumptuous seafood lunch consisting of shellfish, chilli crab, calamari, prawns and fried klanglong. We had a wonderful time getting to know one another before we wound up at a neighbourhood shop for ointment and the mega malls for more deals till the sun set. Talk about ‘shop till you drop’!

By Yvonne Chia, DSS

ENTER THE DRAGON BOAT – FOR CHARITY

A group of dragon boat enthusiasts will be testing their strength and endurance by embarking on a 150 kilometre “Round The Island” paddling challenge. This is the first official attempt to challenge the Singapore coast line distance in a dragon boat within a record-setting time of 30 hours. The event, organised by the challengers, Lions Club of Singapore Metropolitan and the SAF Yacht Club, is part of President’s Challenge 2007.

Leader of the team Captain Yong Yong Ching, a 36-year-old National Junior College teacher, said that they have been training very hard for months and hope to raise diabetes awareness and funds for the President’s Challenge with some proceeds to DSS.

The team comprises 22 members, both male and female, who are mainly from the Mountbatten Community Club and the National Junior College Alumni. On 1 September 2007 at 8.00 am, they will depart from Changi Yacht Club and return the following day at 2:00 pm.

Among the challengers, four of them are record-holders in last year’s Sub-30 hour Round Singapore Canoeing Challenge 2006, which was jointly organised in aid of DSS. This event was officiated by the Singapore Book of Records and was featured by Channel NewsAsia in August 2006 and October - December 2006 issue of Diabetes Singapore which is published by DSS.

Insulin is a naturally occurring hormone secreted into the blood stream to promote the metabolism of carbohydrates, fats and proteins.
NEWS BUZZ

Upcoming outreach talks/health screenings conducted by Diabetic Society of Singapore:

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<td>Wednesday, 11 July 2007 4.00 pm to 5.00 pm</td>
<td>Introductory Talk on Diabetes &amp; Healthy Living (English)</td>
<td>RSVP Singapore 9 Balcony Place 05-02 303-304 (Mandarin) Suntec Singapore Convention &amp; Exhibition Centre Room 303-304 (Mandarin)</td>
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<tr>
<td>Saturday, 21 July 2007 2.30 pm to 4.30 pm</td>
<td>Publicity Booth on DSS Services &amp; Introductory Talk on Diabetes &amp; Healthy Living (Mandarin)</td>
<td>Yuhua CC 92 Boon Lay Way Singapore 699462</td>
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<tr>
<td>Saturday, 28 July 2007 9.00 am to 12.00 pm</td>
<td>Publicity Booth on DSS Services Organised by Central CDC</td>
<td>Suntec Singapore International Convention &amp; Exhibition Centre Room 303-304 (Eng &amp; Mandarin)</td>
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<td>Tuesday, 7 August 2007 2.00 pm to 3.00 pm</td>
<td>Public Outreach What is Diabetes? Let’s talk about it with Healthy Living Tips (Mandarin) Women’s Initiative for Ageing Successfully (WINGS)</td>
<td>9 Balcony Place 05-02 Singapore 579837</td>
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<td>Sat-Sun, 1 &amp; 2 September 2007 11.00 am to 7.30 pm</td>
<td>‘Bonding Hearts &amp; Homes’ Fair Organised by NVPC &amp; North East CDC</td>
<td>Open Field next to Hougang MRT Station</td>
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<tr>
<td>Sat-Sun, 1 &amp; 2 September 2007 12:00 pm to 2:00 pm</td>
<td>Sub 30-Hour Round Singapore Dragon Boat Challenge 2007 for President’s Challenge and DSS</td>
<td>SAP Yacht Club (Changi) 110 Telok Blangah St 3, Singapore 098800</td>
</tr>
<tr>
<td>Wednesday, 12 September 2007 4.00 pm to 5.00 pm</td>
<td>Public Outreach What is Diabetes? Let’s talk about it with Healthy Living Tips (Mandarin)</td>
<td>RSVP Singapore 9 Balcony Place 05-02 303-304 (Mandarin) Suntec Singapore Convention &amp; Exhibition Centre Room 303-304 (Mandarin)</td>
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Info accurate as of July 5, 2007.

WE NEED YOU!

Diabetic Society of Singapore will be organising an island-wide Flag Day on 17 November 2007 to raise funds for its three Diabetes Education & Care Centres and Mobile Health Clinic as well as subsidies for the less fortunate with diabetes.

We welcome volunteers who are keen to share their skills and experiences to make our Flag Day meaningful and successful.

If you would like to volunteer, please fax or send your particulars to:
Diabetic Society of Singapore
17 Ang Mo Kio Ave 9 450-12
Ang Mo Kio Hospital
Singapore 569766
Fax: 65331801

Full Name: ____________________________________________
IC No.: ______________________________________________
HP: ___________________________________________________
Address: ________________________________________________________________________________________
Email: ___________________________________________________________________________________________

For more information, contact us at: yvonne@diabetes.org.sg or tel: 64506132

The Diabetic Society of Singapore held its 36th Annual General Meeting which saw over 100 members on 28 April 2007 at Rose Room 1 & 2, York Hotel Singapore. A public forum on “Cholesterol Tablets - Tackling the Myths and Misconceptions” was conducted by Dr Daniel Wai of Singapore General Hospital and Ms Verena Tan, dietitian from Tan Tock Seng Hospital, before the AGM convened.

The Society deeply appreciates Pfizer Pte Ltd for sponsoring the venue as well as the free lipid test coupons for the members attending the AGM.

Public Forum: Diabetes Prevention Tips for Those At Risk
Date: Saturday, 28 July 2007
Time: 2.30 pm to 5.00 pm
Venue: Room 305 (Mandarin Forum) Suntec Singapore Convention & Exhibition Centre 1 Raffles Boulevard Suntec City Singapore 039593

DSS Flag Day
Date: Saturday, 17 November 2007
Time: 8.30 am to 5.00 pm (Shift rotation)
Venue: Island-wide
Tel: 64506131 or 64506132
Diseases of the Heart

Many studies have established the fact that patients with gum diseases are at higher risk of recurrence of stroke.

It has also been found that often patients with congenital heart defects of the valve or those who had valvular replacements of the heart require a relatively high dose of antibiotics before dental treatment to prevent occurrence of a heart disease known as infective endocarditis (infection of the inner layers of the heart). This is because bacteria from dental plaque can get into the bloodstream via injuries or wounds in the mouth. Then, it can get lodged onto these vulnerable, defective heart valves and cause infection. It is important to be clear about the disease process as infective endocarditis can occur when there is no dental treatment. That is because when a person’s oral hygiene is poor, bacteria can enter the bloodstream through any open wound or sore in the mouth.

Diabetes

Diabetics have poor immune response to infection. If their blood glucose level is not well controlled, they are more likely to have gum diseases and develop gum abscesses (gum boils). These swelling of the gums can be painful. The presence of the gum disease may affect your body’s ability to process and use insulin. This may cause diabetes to be more difficult to control, which in turn results in the gum disease becoming more severe than in a non-diabetic. In other words, a clean, healthy mouth makes it easier to keep the diabetes under control.

Pregnancy

It is of utmost importance that pregnant women visit the dentist for regular dental check-ups as there are several oral diseases that pregnant women are prone to suffer from. In severe cases it may even affect the foetus. These oral diseases include pregnancy gingivitis, and pregnancy epulis, which are swellings of the gum. Researchers have also found that there is a correlation between increasing severity of gum disease and pre-term low birth weight (PLBW) babies. Gum disease is an infection of the gums. As explained in the previous paragraph, it can lead to high levels of bacterial toxins in the blood stream. This can stimulate premature labour.

So, general illnesses of the body could begin in the mouth! And, lack of oral hygiene can make general illnesses worse. It is a two-way relationship. Do visit your dentist to find out more about the connection between your general health and oral hygiene.

For more information on the above article, contact Dr Terence Jee at weinea@yahoo.com.sg

This article is contributed by the Singapore Dental Health Foundation, an organisation of volunteers who work to educate the public on dental health.

www.dentalhealth.org.sg

The focus of this year’s Oral Health Campaign is the prevention of gum diseases. The Adult Oral Health Survey 2003 revealed that 30% of the public aged 20 years and above were not aware of gum diseases. And close to 85% of those surveyed had some form of gum disease. If left untreated, gum disease can eventually lead to tooth loss. The main cause of gum disease is poor oral hygiene, which results in build up of plaque around the gums.

As part of the Oral Health Campaign in August 2007, Colgate, Singapore Dental Health Foundation, Singapore Dental Association and the Health Promotion Board will run roadshows in three shopping mall locations. This is an opportunity not to be missed as there will be FREE dental check-ups, dental consultations and FREE Colgate toothpaste samples.

Oral Health Month 2007 Roadshows 10.30 am - 8.30 pm
3 – 5 August Causeway Point, Woodlands
17 – 19 August HDB Hub, Toa Payoh
24 – 26 August Bukit Panjang Plaza, Bukit Panjang

People with type 1 diabetes produce inadequate amounts of insulin, so insulin replacement is their key treatment.
Without adequate insulin replacement, people with type 1 diabetes will see their blood sugar levels rise and the body will start to burn up its fat stores. This might lead to a life-threatening condition called diabetic acidosis.

Diabetes is a common health problem in Singapore. One out of 11 people aged 18 to 69 has diabetes. A 2001 survey on primary medical care in Singapore showed that diabetes was the eighth most common medical condition diagnosed. In 2005, diabetes was the eighth most common cause of death, accounting for 3.1% (an increase from 2.3% in 2003) of all deaths.

Diabetes is a chronic disease, and if not managed well, can deteriorate steadily to cause devastating complications such as blindness, nerve damage, kidney failure, heart disease and limb amputation. Studies show that about half of patients already have diabetes-related complications at the time of diagnosis.

Screen Tests

Early detection is essential to prevent any complications later. It is therefore very important to begin screening as soon as possible. There are several diabetes complications screening tests:

- HbA1c
- Cholesterol Screening
- Microalbuminuria Test
- BMI Test
- Blood Pressure Check
- ECG
- Diabetic Foot Screening
- Diabetic Retinal Photography
- Education on Patient Self-care
- HbA1c

Diabetes patient need to maintain good blood sugar control. If you have a blood sugar meter, you can do the test yourself as it can provide real-time information about your blood sugar level. A HbA1c test is a test done by your doctor to check your glycosylated haemoglobin level. This test is recommended once every three months. It is a good gauge of your general diabetes control. One’s risk for complications from diabetes can be shown from a HbA1c test.

Cholesterol Screening

Most people with diabetes are at risk for cardiovascular diseases such as heart attack and stroke. Hence, a cholesterol check should be done at least once a year or as recommended by your doctor.

There are five components in the cholesterol screening. These are TC, HDL, LDL, TG and also the total cholesterol to the HDL ratio. LDL which is the high density lipids is usually referred to as “healthy” cholesterol.

Higher levels of HDL can reduce cardiovascular risks. LDL which stands for low density lipoprotein is usually known as the “lousy” cholesterol. A high level of LDL has the opposite effect from HDL which is to increase the risk of cardiovascular risk. A level of LDL <2.6 is recommended in all diabetes patients (Ministry of Health, 2006).

Last but not least, the ratio of total cholesterol to HDL is done to measure the cardiovascular risk an individual has. This is obtained by dividing the total cholesterol by the HDL.

A cholesterol check is recommended once a year. But, if the cholesterol is higher or lower than normal, the doctor or diabetic nurse educator may recommend the test to be done once every six months.

Microalbuminuria Tests (MAU) Screening for Diabetic Kidney Disease

Diabetes is the leading cause of end-stage renal disease in Singapore. It accounted for nearly half (47.2%) of the cases of end-stage renal disease (ESRD) in Singapore in 2000.

The development of microalbuminuria highlights the potential development of renal complications. Screening for albuminuria should begin five years after the diagnosis of Type 1 diabetes; it should commence immediately with the diagnosis of Type 2 diabetes. Therefore, screening for albuminuria should be done annually.

Fast Facts

- Without adequate insulin replacement, people with type 1 diabetes will see their blood sugar levels rise and the body will start to burn up its fat stores. This might lead to a life-threatening condition called diabetic acidosis.
BMI (Body Mass Index)

BMI, which stands for body mass index, is a unit of measurement to describe weight in relation to height. This measurement will classify you under the underweight, normal, overweight or obese range. The Health Promotion Board of Singapore has recommended that the BMI for Asians be kept between 18.5 and 22.9. Keeping your BMI within the normal range will help you to control your blood sugar, cholesterol and blood pressure. This will also minimise your risk of cardiovascular disorders.

Blood Pressure Check

Most diabetes patients have high blood pressure too. This puts them at a high risk for cardiovascular attacks as the condition may cause damage to the blood vessels and makes the heart work faster (Canadian Diabetic Association, 2007). High blood pressure is also a risk factor for other complications of diabetes, such as diabetic eye disease and kidney disease. Maintaining a normal blood pressure is critical to your management of diabetes.

ECG Test

In 2005, 18.1% of deaths in Singapore was caused by ischemic heart disease and 4.0% was caused by other heart problems.

People with diabetes are at risk of heart disease especially if the blood sugar level is not well controlled. Coronary artery disease is the most common form of heart disease in diabetes.

Over time, high blood sugar levels clog and harden blood vessels, affecting blood flow and causing blood clots creating circumstances for heart disease and also stroke. Therefore, an ECG (Echocardiogram) test should be done as a form of baseline during the initial phase of diabetes. This is done to measure the electrical activity of the heart and to detect any abnormalities. Subsequent ECG tests can be done periodically as ordered by your doctor.

Diabetic Foot Screening

“Foot ulcers and amputations are a major cause of morbidity and mortality in people with diabetes. In Singapore, approximately 700 lower extremity amputations (LEA) are performed in diabetic patients annually” (MOH, 2006)

Fortunately steps can be taken to prevent diabetic foot complications or limit its progression. Several studies showed that lower limb amputations could be reduced by up to 85% through early detection, regular health screening, diabetic education and timely treatment at the primary and acute care level. This can be achieved through an annual screening of the feet, which involves risk identification, treatment and patient education appropriate to the level of risk.

Diabetic Retinal Photography

Persons with diabetes are 25 times more likely to become blind compared to those without diabetes. Currently, an estimated 2.5 million people worldwide are blind from diabetic retinopathy. In Singapore, retinal conditions, including diabetic retinopathy, are leading causes of blindness in adults.

It is therefore vital for an eye examination to be carried out yearly. A patient with type 1 diabetes should be examined three to five years after diagnosis once he/she is aged 10 years or older, and at least once a year subsequently. As for patients with type 2 diabetes, an eye examination should be done immediately after diagnosis and at least once a year subsequently.

Patient Self-care Education

Patients should be educated about their condition and encouraged to take an active role in the management of their own condition. Life-long compliance is required from the patient and hence, self-care forms the cornerstones of treatment.

These tests are crucial in your steps to prevent complications related to diabetes. Doing the tests does not just stop there. Working towards keeping the results as normal as possible is important as well. If you do have a diabetes-related complication, treatment can be effective, with early diagnosis. Ensure that you work with your diabetes health care team to achieve good results and maintain a healthy and happy lifestyle.

REFERENCES


Insulin is an essential hormone which the body needs to control or properly use glucose (sugar) – one of its main supplies of energy.

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Insulin is an essential hormone which the body needs to control or properly use glucose (sugar) – one of its main supplies of energy.
MY EYES

Too much insulin may lead to such low levels of blood sugar that it causes a condition called hypoglycaemia.

Fast Facts

Introduction

Diabetes Mellitus has more than what meets the eye — causing one to lose his or her sight. Almost all type 1 diabetes patients and 60% of type 2 diabetes patients have a certain degree of diabetic eye disease within twenty years of onset of the disease. On a more alarming note, a study by Wisconsin Epidemiologic Study of Diabetic Retinopathy showed that 3.6% of type 1 diabetics and 1.6% of type 2 diabetes patients were legally blind.

What is diabetic retinopathy?

To the public, Diabetes Mellitus usually brings with it images of amputated limbs, people with kidney failure undergoing dialysis and even the occasional heart attack. Sadly, the message of the complications of diabetic retinopathy has not been brought into focus. The primary reason could be because of the myriad of complicated terms that patients find hard to digest.

In simple terms, diabetic retinopathy is basically the disease of the retina — the photographic film at the back of the eye that a person’s visual images are focused upon. The macula is a particular spot on this film that is responsible for our central vision. On the film itself are many small vessels that deliver nutrients to it. Diabetes, being a disease of blood vessels, attacks the very walls of the vessels on the retina and causes the leakage of proteins and fats from these vessels.

The end result? Thickenning of the wall of the retina and the macula, as what is termed medically, Macular Edema. This can lead to the loss of our central vision and the distortion of the images focused upon the retina.

Other complications include bleeding into the retina (retinal haemorrhages), formation of abnormal vessels (microaneurysms and venous beading) and, on a more serious note, formation of new blood vessels leading to bleeding into the vitreous jelly and detachment of the retina from the wall.

Screening for diabetic retinopathy

The dire consequences of complacency are enough to scare one into action. How does one get started? Firstly, it is recommended that for type 1 diabetes patients, first time screening of the eye should be done within three to five years of diagnosis of disease.
For type 2 diabetes patients, screening should be done at the time of diagnosis. The urgency is because many of these diabetes patients would have already had diabetes for six to seven years but have not had prior knowledge of it.

Screening of the eye involves taking photographs of the fundus of the eye and subsequent yearly follow-ups to record any progression of the disease. This can be done at the regular outpatient polyclinics or at the general practitioner’s clinics with the appropriate facilities.

**When do I need to see the eye specialist?**

So when does the diabetes patient see the ophthalmologist? Diabetic retinopathy is basically classified into non-proliferative and proliferative type. The former is divided into mild, moderate and severe depending on the classification of the retinal picture.

Referral to the ophthalmologist has to be made once the diagnosis of severe non-proliferative type or the proliferative type is made. This is to allow for the early intervention of laser to halt the progression of the disease before it bores into more serious complications.

In addition, if the patient complains of sudden onset of worsening of vision and is found to have more serious complications like bleeding into the vitreous or even detachment of the retina, urgent referral to the ophthalmologist has to be made for surgery.

However, if the disease has already reached this stage, the usual prognosis would likely remain poor even with surgical interventions. Take action before it is too late.

**Do I need to be follow-up regularly?**

The story does not end here. Even with the intervention of laser and surgery, it is still crucial for the patient to continue follow-ups to monitor disease progression.

For the mild to moderate type of non-proliferative diabetic retinopathy, it is recommended to have follow-up every six to 12 monthly but for the severe type, it is recommended to have one to four monthly follow-ups. For the proliferative type, urgent laser treatment is needed. Always ask your family doctor for his or her recommendations for the duration of follow-up according to the clinical guidelines.

**Take charge**

You need to take charge and be responsible in ensuring that there is adequate and good control of the blood sugar level and blood pressure. Studies have shown that poor control of these two factors could worsen the progression of diabetic eye disease.

In diabetes patients with hypertension, it is recommended by the UKPDS study to have tight control blood pressure below 130/80mmHg to prevent diabetic complications.

**Save your sight**

Diabetes is a battle that can be fought if the proper armour is used. The same is true for diabetic eye disease. Armed with the above information, the patient and the physician can work hand in hand to prevent vision impairment. The message to the diabetic patient is clear – save your sight before it is too late.
Yummy Dhal Curry

**INGREDIENTS**
- 1 cup Lentils (choose either red, yellow, green or brown), washed
- 2 ½ cups water
- 1 large onion, chopped
- 1 clove garlic, chopped
- 1 Tbsp oil
- 1 Tbsp ground coriander powder
- 1 ½ tsp turmeric powder
- 1 ½ tsp chilli powder
- ½ tsp cumin seeds
- ½ tsp mustard seeds
- Curry leaves – 1 stem
- Salt to taste (optional)

**METHOD**
- Boil lentils in water until soft (about half an hour). Remove any froth.
- Heat 1 tablespoon of oil in a small frying pan. Once hot, add mustard seeds, cumin seeds, onions, ginger & garlic. Fry till onions are lightly browned.
- Add tumeric, chilli, coriander powder and lastly, curry leaves. Fry till mix becomes a fragrant paste.
- Add this mix to boiled lentils. Stir well. Add salt to taste (optional).
- Serve with hot rice, bread or chapatti.

**Nutrition Analysis by Health Promotion Board (Serves 6)**

- **Calories per serve (1/2 cup):** 212
- **Total Fat:** 1g
- **Sodium:** 27mg
- **Carbohydrates:** 37g
- **Dietary Fibre:** 7.2g
- **Protein:** 1g

Carbohydrate Exchanges: 2
**Easy Bean Salad**

**INGREDIENTS**

- **Dressing Salad**
  - Lemon juice of 1 lemon
  - 1 medium onion, chopped
  - 50ml vinegar
  - 1 Tbsp olive oil
  - Ground black pepper
  - 1 can lima beans, drained
  - 1 green capsicum chopped
  - 6 stalks celery, chopped

- **Tofu Patties**
  - 350g firm tofu
  - 10ml Healthy Choice Symbol Oil
  - 1 stalk celery, finely chopped
  - 1 large egg, beaten
  - 2 slices low fat cheese
  - Pepper to taste
  - Crushed dried herbs (optional)

**METHOD**

- **Easy Bean Salad**
  - Add chopped onions, capsicum and celery in a large salad bowl together with ALL drained beans.
  - Prepare dressing – mix lemon juice, olive oil, vinegar and pepper together.
  - Toss dressing over salad. Coat evenly. Place in refrigerator and turn periodically to mix before serving.

**Nutrition Analysis by ALLRecipes (Serves 10)**

- Calories per serve (small bowl): 173
- Total Fat: 1g
- Sodium: 253mg
- Carbohydrates: 35g
- Dietary Fibre: 5.7g
- Protein: 4.2g

Carbohydrate Exchange: 2

- **Tofu Patties**
  - Saute onion & celery until soft and lightly browned. Place in a medium bowl and set aside.
  - Finely chop tofu, remove excess water. Place in bowl together with onion & celery
  - Mix in egg, cheese, pepper & herbs (optional) until thoroughly combined.
  - Heat a large non-stick frying pan over medium heat. Add sufficient oil to lightly coat pan. Drop tofu mix into 6 equal portions. Flatten with spatula to form patties. Fry for 5 to 7 minutes on each side till golden brown.

**Nutrition Info (Serves 6)**

- Calories per serve: 151
- Total Fat: 11.4g
- Cholesterol: 34mg
- Sodium: 71mg
- Carbohydrates: 4.1g
- Dietary Fibre: 1.7g
- Protein: 11.3g

Carbohydrate Exchange: <1

Nutrition Analysis Provided by AllRecipes
Dear Dietitian,

Some of the fruit juices in supermarkets claim that they have no sugar added. Does that mean that these juices will not affect my blood sugar levels and weight since they have no sugar?

Dear Reader,

For packaged fruit juice drinks, nutrient claims such as “no added sugar” often refers to no added glucose or sucrose or other sugars to the product during processing. All fruit juices, however, still contain fructose, which is a sugar that occurs naturally in all fruits. Fructose, glucose, and sucrose are just different types of sugar and will all affect your blood sugar levels. Your body cannot distinguish between natural fruit sugar and added sugar; it uses both in similar ways.

Rather than the type of sugar, what mainly affects blood sugar levels is the total amount of sugar (or total amount of carbohydrate), in a serving of juice. The overall energy and carbohydrate content per 100ml of original and “no added sugar” varieties of fruit juice at the supermarkets are almost similar, with the original varieties usually slightly higher. These small differences may become significant though if your juice intake is high. Be careful not to drink excessive amounts of juices even if they are the “no added sugar” variety.

The Health Promotion Board has recommended two servings of fruit to be consumed daily with no more than one serving coming from fruit juice (one serving is equivalent to one cup (250ml) of pure fruit juice). If you have diabetes, you may want to further limit this to only half a cup per day. Much of the valuable fibre in fruit is removed in the process of making juices; therefore it is best to eat fresh fruit instead of drinking juice. If you are watching your weight, do also bear in mind that one cup of fruit juice may require two or more servings of fruit to produce and will provide you with more calories than just having one serving of fruit.

Dear Dietitian,

How are packaged fruit juices from the supermarket different from homemade (squeezed/juiced) juices? Are they a better choice since they are fortified with vitamins and minerals?
In the early years of type 2 diabetes, the body compensates for this insulin resistance by increasing the output of insulin from the pancreas gland. Later on, the pancreas is unable to cope.

Dear Reader,

To be marketed as a “fruit juice” the product must contain at least 90% natural juice. A quick survey of major supermarkets revealed that the majority of packaged juices sold are reconstituted “fruit juice drinks”, which have been concentrated and then diluted prior to sale and may have sugars or sweeteners added.

True fresh squeezed juice such as those from home is harder to market commercially due to issues of shelf life. By reading the ingredients list found on the packaged drink, you will sometimes be able to tell if a juice is reconstituted as “juice concentrates” will be listed there. Concentration of juices is achieved by heating the juice to evaporate water and the concentrate is eventually refrigerated until it is ready to be reconstituted. This process is useful by extending the shelf life of the juice and making storage and shipping more economical. An apple and cranberry juice drink may be made by blending apple, cranberry and other concentrates together with water to achieve the desired sugar to acid ratio, colour and flavour, before the juice is packaged for sale.

Additives such as permitted flavouring, preservatives and antioxidants are also added to improve shelf life. Fortification of juices with Vitamins A & E, beta-carotene and calcium is increasingly common but does not make packaged juices a better choice, as the extent of stability and absorption of these added vitamins and minerals is uncertain.

Freshly juiced or squeezed juice at home is free of additives and also high in vitamins and minerals if consumed soon after juicing. Remember to consume the pulp together with the juice for valuable fibre!

Dear Dietitian,

I am currently drinking bittergourd juice every morning. Does this help lower my blood sugar levels?

Dear Reader,

Studies on bittergourd’s blood sugar lowering effects in humans are still inconclusive currently. Two published scientific reviews concluded that although bittergourd may have blood sugar lowering effects, better-designed human studies are necessary to properly assess its safety and efficacy before a dietary recommendation can be given. Some adverse effects such as hypoglycaemia coma, convulsions and headaches after intake of bittergourd tea and seeds have also been reported.

It is therefore important to inform your healthcare professional caring for your diabetes that you are having bittergourd juice and monitor for any adverse effects. Do not forget, however, that bittergourd is a highly nutritious vegetable and can be considered as one of your options when having at least two servings of vegetables a day!

1 Health Promotion Board (HPB) 2006, ABCs of Healthy Eating, Health Promotion Board, Singapore
It is common to observe high blood sugar after a meal in those with type 2 diabetes. Exercising one to three hours after eating may reduce post meal sugar level. Hence, exercise is very important in the management of diabetes.

However, exercise works differently from one individual to another. So it is advisable to monitor the effect of a certain physical activity on your blood sugar level.

Test your blood sugar level before and after exercise. Check two to three hours later as high intensity and long duration exercise (such as running for an hour at 8km/h or more) can lower one’s blood sugar for up to 24 hours.

**Check your blood sugar level before you start to exercise**

<table>
<thead>
<tr>
<th>Blood Sugar Level</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5 – 13.5 mmol/L or 100 – 240 mg/dl</td>
<td>Safe to start exercising</td>
</tr>
<tr>
<td>Less than 5.5 mmol/L or 100 mg/dl</td>
<td>Take 15g of carbohydrates as snack before exercising</td>
</tr>
<tr>
<td>More than 13.5 mmol/L or 240 mg/dl</td>
<td>Delay exercise, rest and retake sugar level 15 to 30 minutes later</td>
</tr>
</tbody>
</table>

About 25 per cent of people with type 2 diabetes eventually need treatment with insulin.

**Fast Facts**

- It is common to observe high blood sugar after a meal in those with type 2 diabetes.
- Exercising one to three hours after eating may reduce post meal sugar level. Hence, exercise is very important in the management of diabetes.
- However, exercise works differently from one individual to another. So it is advisable to monitor the effect of a certain physical activity on your blood sugar level.
- Test your blood sugar level before and after exercise. Check two to three hours later as high intensity and long duration exercise (such as running for an hour at 8km/h or more) can lower one’s blood sugar for up to 24 hours.

**Exercise & Medication**

Your blood sugar level may just go up after a meal if you are a type 2 diabetes patient. Bring it down with exercise, says Cindy Ng, Senior Physiotherapist, Singapore General Hospital.
If you are on insulin, you have to avoid exercising during the peak insulin action. If this is unavoidable, consider reducing insulin dose by two to four units. Always have a snack on hand in case of hypoglycaemia or low blood sugar. A good snack includes glucose tablets, one slice of bread or a small cup of beverage such as plain Milo.

Always have sufficient fluids before, after and during exercise to prevent dehydration. For exercise in the mid-morning, for example, when short-acting insulin is expected to peak, reduce the dose of insulin or take extra carbohydrates for breakfast.

Another precaution is to choose injection sites that are less likely to be affected by the working muscles during exercise. For example, if running is your form of exercise, do not inject into the legs as that will result in greater absorption of the insulin and increase the risk of hypoglycaemia during the run.

Stop exercising if you experience the following symptoms and check your blood sugar level, heart rate and blood pressure:

- light headedness or dizziness
- tightness in chest, discomfort or pain (seek medical attention immediately)
- severe shortness of breath
- nausea

With appropriate monitoring and taking the necessary precautions, one can exercise safely and have fun at the same time.

It is important to carry out stretches before and after the exercise regime.

Here are some stretches you can do:

- Quadriceps stretch: bring the leg as far back as possible keeping the body upright. You will feel the stretch on the front thigh
- Hipstring stretch: Reach as far forward as possible keeping the back straight. You will feel the stretch behind the knee
- Calf stretch: align the feet in one direction keeping both flat on the ground. Lean forward on the front leg, bending the knee slightly. You will feel the stretch on your calf

The longer a person has type 2 diabetes, the more likely they will have to start insulin treatment at some point.
MEDICAL CONVERSATION

Insulin Insights

Treatment of diabetes has come a long way since insulin was discovered in 1920 by Dr Frederick Banting. Associate Professor Sum Chee Fang, Senior Consultant, Endocrinologist, Alexandra Hospital; Senior Staff Nurse Heng Boon Ling and Staff Nurse Josephine Tan give an update on the latest insulin therapies to control blood glucose levels.

Who needs insulin treatment?

Insulin can improve blood glucose control; it can prevent or delay the complications of diabetes. Insulin therapy may be needed in the following circumstances:

- Patients with type 1 diabetes
- Patients with type 2 diabetes who are not able to achieve appropriate HbA1c target in spite of oral medications and appropriate lifestyle habits
- Patients with type 2 diabetes who are planning pregnancy and during pregnancy
- Patients with gestational diabetes who are not able to achieve blood glucose targets with appropriate diet and lifestyle

Fast Facts

Who needs insulin treatment?

- Patients with type 1 diabetes
- Patients with type 2 diabetes who are not able to achieve appropriate HbA1c target in spite of oral medications and appropriate lifestyle habits
- Patients with type 2 diabetes who are planning pregnancy and during pregnancy
- Patients with gestational diabetes who are not able to achieve blood glucose targets with appropriate diet and lifestyle

What are the different types of insulin?

Currently, insulin is usually injected by patients subcutaneously (just under the skin). Insulin formulations can be divided into different categories based on:

- How fast they start to work (Onset)
- When they reach the peak of action (Peak)
- How long they stay effective in your body (Duration)

Due to its onset of action, a meal should be taken immediately after a shot of rapid acting insulin or an insulin mixture containing rapid acting insulin e.g. aspart, Novomix 30/70 insulin.

Due to its onset of action, a meal should be taken about half an hour after a shot of short acting insulin or an insulin mixture containing short acting insulin e.g. regular insulin, Mixtard 30/70 insulin.

What are the various insulin devices available?

Currently, insulin is usually injected subcutaneously using different patient-friendly devices. There is the conventional method of using the disposable syringe and vial.

Other convenient devices are pre-filled disposable insulin pen, which allows easy handling and dialing of units without the hassle of withdrawing insulin from the vial. The insulin pen comes with replaceable cartridges or in the form of disposable pens. With medical and technological advancement, insulin pumps for delivering of insulin continuously and precisely are also available.

Inhaled insulin is another latest development. It provides insulin in a form of spray or dry powder inhaled through the mouth directly into the lung and passes to the blood stream. It can be used to provide meal insulin boluses.

<table>
<thead>
<tr>
<th>Types of Insulin</th>
<th>Names of Insulin</th>
<th>Onset</th>
<th>Peak</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Acting</td>
<td>Lispro/ Aspart</td>
<td>5-15 mins</td>
<td>1 hour</td>
<td>3-5 hours</td>
</tr>
<tr>
<td>Short Acting</td>
<td>Humulin R/ Actrapid</td>
<td>0.5-1 hour</td>
<td>2-3 hours</td>
<td>3-6 hours</td>
</tr>
<tr>
<td>Intermediate Acting</td>
<td>Humulin N/ Insulatard</td>
<td>2-4 hours</td>
<td>7-8 hours</td>
<td>10-12 hours</td>
</tr>
<tr>
<td>Long Acting</td>
<td>Glargine/ Levemir</td>
<td>1-2 hours</td>
<td>No peak</td>
<td>Up to 24 hours</td>
</tr>
<tr>
<td>Pre Mixed Insulin</td>
<td>Mixtard 30/70, Mixtard 50/50, Humalog 25/75</td>
<td>30 mins</td>
<td>2-8 hours</td>
<td>10-12 hours</td>
</tr>
<tr>
<td>Pre Mixed Analogue</td>
<td>Novomix 30/70</td>
<td>10-20 mins</td>
<td>1-4 hours</td>
<td>10-12 Hours</td>
</tr>
</tbody>
</table>

Insulin cannot be taken by mouth because it gets inactivated by the digestive enzymes in the gut. It is therefore most commonly given as an injection under the skin, usually into the thigh, buttocks, abdomen or upper arm.
Which is the best site to inject?

Insulin is to be injected into the subcutaneous tissue of the body. Intramuscular injection is not recommended for routine use, as the rate of absorption is faster. Site selection is important as it affects absorption:

The more common site of insulin injections is:
- Abdomen (this is the fastest and most consistent)
  - Allow two inches away from navel

Other sites are also sometimes used:
- Upper arms (slower)
  - Outer back area of the upper arm
- Anterior and lateral aspects of thigh (slowest)
  - Outer mid lateral of thigh
- Buttocks (slowest)
  - Outer quadrant of the buttock

Rotation of injection site is essential to prevent fat deposit as repeated shot in the same spot can cause lipohypertrophy. This can lead to slower and inconsistent absorption of insulin.

Rotating within abdomen is recommended rather than rotating to a different region with each injection as this increases absorption variability.

How should insulin be stored?

There are specific storage guidelines provided by different manufacturers. As a general rule, vial insulin should be refrigerated at two to eight degrees Celsius. Insulin (vials and pens) should be kept at the lower part of refrigerator, away from the freezer. Extreme temperature (<2 or >30 degrees Celsius) should be avoided to prevent loss of potency, clumping, frosting or precipitation.

Unopened insulin vials and pens should be kept in the refrigerator. Open vials of insulin (vials and pens) should be used within a month. When traveling, insulin should always be hand carried and not checked in with luggage. Insulin pens in use can be stored in room temperature (less than 30 degrees Celsius).

What are the different kinds of insulin syringes and needles available?

Insulin syringes comes in different capacity of 30cc, 50cc and 100cc. Length of needles are also available in 6mm, 8mm and 12.7mm. There are also smaller gauge needles – 30G and 31G to help those who are fearful of pain when injecting.

For the finer and thinner 31G needles, caution is required when injecting, as the needle- end can bend into a hook and cause laceration to the tissue or skin.

It is advisable to all clients that syringes or needles should not be reused. Do not wipe or clean needles with alcohol, too. Choosing the appropriate length of insulin needle is essential as it can vary insulin absorption.

Symptoms of hypoglycaemia include paleness, shaking, shivering, perspiration, rapid heartbeat, hunger, anxiety and blurred vision.

What are the causes of hypoglycaemia?

- Too little carbohydrates
- Too much exercise
- Too much insulin
- Delayed/missed meal
- Taking alcohol without food

What are the signs and symptoms of hypoglycaemia?

- Sweating
- Trembling of hands/ nervousness
- Hunger
- Dizziness/ headache
- Change in behaviour/ moody/ confused
- Tiredness
- Unconsciousness

How do we treat hypoglycaemia?

In the patient who is conscious and able to take orally, apply the 15-15 rule:

Take 15gm of fast digesting carbohydrates e.g. three teaspoons of glucose powder in 120mls of water or three to five candies. Than check glucose 15 minutes later. If blood sugar increases above 4mmol/L, a slow digesting carbohydrate or snack can be taken. If you do not feel any better, repeat the above or consult your doctor.
There are many types of insulins available and are differentiated by their duration of action as shown in table 1. Your doctor will select the type and dose of insulin according to your needs based on your diabetes control and lifestyle.

1. Insulin injection

Your insulin is to be injected subcutaneously into the fatty tissue, such as the abdomen area. It is important to rotate the site of injection, as repeated injections at the same place will result in tough or lumpy tissue and less effective absorption of insulin.

The timing of injection depends on the type of insulin you are on. Please consult your doctor or pharmacist to verify the timing of the insulin injection and whether some of your insulins can be mixed.

It is important to store your insulin in the fridge (do not freeze). Once it has been opened, your insulin is stable for up to four weeks. Make sure you indicate the date of opening on each opened insulin bottle. Do not use expired insulins. Always inspect your insulin and if lumps are present, do not continue to use it as the lumps indicate the insulin may be damaged.

### Table 1

<table>
<thead>
<tr>
<th>Insulin Preparation</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ultra short acting</strong></td>
<td></td>
</tr>
<tr>
<td>Insulin Lispro</td>
<td>Humalog®</td>
</tr>
<tr>
<td>Insulin Aspart</td>
<td>Novorapid®</td>
</tr>
<tr>
<td>Insulin Glulisine</td>
<td>Adipra®</td>
</tr>
<tr>
<td><strong>Short acting</strong></td>
<td></td>
</tr>
<tr>
<td>Recombinant DNA Origin</td>
<td></td>
</tr>
<tr>
<td>Regular human insulin</td>
<td>Humulin® R</td>
</tr>
<tr>
<td></td>
<td>Actrapid®</td>
</tr>
<tr>
<td><strong>Intermediate acting insulin</strong></td>
<td></td>
</tr>
<tr>
<td>Recombinant DNA Origin</td>
<td></td>
</tr>
<tr>
<td>NPH Isophane suspension</td>
<td>Humulin® N</td>
</tr>
<tr>
<td><strong>Long acting insulin</strong></td>
<td></td>
</tr>
<tr>
<td>Human Insulin Analogues</td>
<td></td>
</tr>
<tr>
<td>Insulin Glargine</td>
<td>Lantus®</td>
</tr>
<tr>
<td>Insulin Detemir</td>
<td>Levemir®</td>
</tr>
<tr>
<td><strong>Combination preparations</strong></td>
<td></td>
</tr>
<tr>
<td>30% Reg insulin + 70% NPH</td>
<td>Humulin® 30/70</td>
</tr>
<tr>
<td>Mixtard® 30</td>
<td></td>
</tr>
<tr>
<td>50% Reg insulin + 50% NPH</td>
<td>Mixtard® 50</td>
</tr>
<tr>
<td>Humalog® Mix 25</td>
<td></td>
</tr>
<tr>
<td>Insulin Lispro 25% + Lispro Protamine 75%</td>
<td>Novomix® 30</td>
</tr>
</tbody>
</table>
The most common side effect of insulin is low blood glucose level (also known as hypoglycaemia). The signs and symptoms of hypoglycaemia include dizziness, rapid heart beat, hand tremors, pale skin colour, sweating, hunger, sudden moodiness or behaviour changes, clumsy or jerky movement, difficulty in paying attention, confusion and seizure.

It is therefore very important for all patients who are on insulin to carry some glucose so that they can immediately take one when they experience hypoglycaemia. The other side effects of insulin are hypersensitivity reaction (such as rashes) and lipohypertrophy (injection site becoming tough or lumpy due to overuse of the same site).

2. Sulphonylureas tablets

Examples: Tolbutamide, glipizide, gliclazide, glimepiride, glibenclamide

Sulphonylureas stimulate the release of insulin from the pancreas. Thus it only used in type 2 diabetes whereby the pancreas is still able to secrete insulin. This medication is to be taken before meals.

The most common side effects are hypoglycaemia and weight gain. People allergic to sulphur may develop an allergic reaction to sulphonylureas and hence, need to use other kinds of oral antidiabetic drugs instead.

3. Metformin

Metformin reduces glucose production from the liver and increase the utilisation of blood glucose by the muscle.

The most common side effects of metformin are nausea, vomiting and diarrhea. Loss of appetite or a metallic taste is also frequently reported. This side effect can be reduced if metformin is to be taken with or after meal. Metformin should not be used in patients with severe kidney disease and heart failure.

4. Short acting secretagogues (Repaglinide, nateglinide)

These secretagogues lowers blood glucose by stimulating pancreatic insulin secretion in a manner dependent on the glucose level. Both repaglinide and nateglinide should be administered before each meal. If you skip a meal, you should also skip your dose for that meal. The main side effect of the secretagogues is hypoglycaemia.

5. Thiazolidinediones (Rosiglitazone, pioglitazone)

The thiazolidinediones increase your body cell’s sensitivity to insulin.

Rosiglitazone has been associated with the side effect of fluid retention leading to weight gain. There are reported cases of liver toxicity in patients taking this group of drugs, thus routine tests to monitor your liver are needed.

6. Alpha-Glucosidase Inhibitors (Acarbose)

These secretagogues lowers blood glucose by stimulating pancreatic insulin secretion in a manner dependent on the glucose level. Both repaglinide and nateglinide should be administered before each meal. If you skip a meal, you should also skip your dose for that meal. The main side effect of the secretagogues is hypoglycaemia.

7. Other new anti-diabetic drugs coming up in the market

Exubera® inhaled insulin

Exubera® is a new inhaled human insulin developed by Pfizer, approved by USA FDA in January 2006 to be used in type 1 or type 2 diabetes. It is currently awaiting approval in Singapore. Exubera® should not be used in patients with lung disease such as asthma, as there is insuffi cient data to support its safe use in this group of patients.

Patients must not smoke during the therapy with Exubera® and must have stopped smoking at least six months before starting Exubera therapy. Therapy should be discontinued immediately if a patient starts or resumes smoking due to the increased risk of hypoglycaemia and the patient should seek alternative treatment.

Incretin mimetic (Exenatide injection)

Exenatide (Byetta®) is an incretin-mimetic that was first approved by FDA in April 2005. It is manufactured by Amylin Pharmaceuticals. Exenatide is injected within one hour before your breakfast and dinner. It stimulates insulin release according to the glucose level and slows stomach emptying (you feel full easily) and reduces glucose produced by the liver.
ELITE XL Blood Glucose Meter
Avoiding reading error from miscoding

There are reports suggesting that miscoded meters will give erroneous blood glucose readings as much as 43%*, which may lead to mistreatment in some serious cases.

ELITE XL blood glucose meter together with the uniformed test strip no. F-5 can avert the human error of entering the wrong code number and deliver highly accurate results.

Product features:
- Pre-coded to further simplify the testing procedures
- Each test strip is foil-wrapped to withstand humidity
- Require only a tiny blood drop
- Compact and lightweight for easy portability
- Can be used with newborns
- Complete with storage capacity for up to 120 test results, as well as data management and meter-to-PC data downloading functions

*Please contact Bayer HealthCare for detail information.

Pharmarite (S) Pte Ltd
6 Toa Payoh Drive, #03-11
Toa Payoh Industrial Building
Singapore 787623
Tel 6452 8488
Fax 6452 7767

Bayer HealthCare
Diabetes Care
Exenatide is indicated as an add-on therapy for patients with type 2 diabetes who are taking metformin, a sulphonylurea, a thiazolidinedione and a combination of metformin and a sulphonylurea, or a combination of metformin and a thiazolidinedione, but have not achieved adequate glycaemic control.

Sitagliptin Phosphate (Javunia®) tablet

Sitagliptin phosphate is an orally-active inhibitor of the dipeptidyl peptidase-4 (DPP-4) enzyme. It is manufactured by Merk Co. and approved for use in USA by FDA on October 2006 as an adjunct to diet and exercise to improve glycemic control in patients with type 2 DM.

Sitagliptin blocks the DPP-4 enzyme from breaking down the incretin hormone that stimulates the release of insulin. Because of its long duration of action, it is taken only once a day. The most common side effects reported are upper respiratory tract infection, sore throat and headache.

These three new drugs - Sitagliptin Phosphate (Javunia®) tablet, Incretin mimetic (Exenatide injection) and Exubera® inhaled insulin - are not yet available in Singapore. For more information about the new drugs, please approach your doctor or pharmacist.

Lifestyle modification

In general, most diabetics will benefit from increased physical activity. The common health goal should be to achieve at least 150 minutes of moderate-intensity physical activity per week. People with diabetes who undertake regular physical activity have been shown to have substantially lower mortality rates over 12 to 14 years.

For underweight individuals with type 1 diabetes, a high carbohydrate (with modest simple sugar intake), low fat (especially low in saturated fat), and low cholesterol diet is appropriate in most situations. Most patients with type 2 diabetes will need caloric restriction. For more details, please consult your dietitian.

Are you or your loved ones taking more than five medicines per day?
Do you have any questions about the medicines you are taking?
Visit your pharmacists with all your medicines for a medicine review or check.

Your pharmacist will:
• Review all your medicines, vitamins and herbal supplements
• Provide personalized advice and information on your medicine therapy
• Assess risks of drug interactions and medicine-related problems

Talk to your pharmacist who can help you take charge of your medicines!
Gardenia Nutri Multi-Grain Loaf is now ‘Low GI’ and Diabetic-Friendly!

✓ Diabetic-Friendly
✓ ‘Low GI’ bread increases blood glucose gradually, providing better control of blood glucose level.
✓ High Dietary Fibre
✓ No Trans Fat
✓ No Cholesterol
✓ Healthier Choice

The Straits Times reported on 10 January 2007 that there are 275,000 diabetics and 500,000 ‘glucose intolerant’ people in Singapore. Make Gardenia Nutri Multi-Grain Loaf your daily source of energy.

To learn more about having better control of your blood glucose level or diabetes, please visit websites, www.gardenia.com.sg or www.glycemicindex.com.
Diabetes, if left uncontrolled, leads to small and big vessel damage causing long term complications that can significantly reduce quality of life.

In the past decade, a number of studies have emerged with different modalities of oral and insulin preparation, enabling many patients to reach and maintain blood glucose level at an optimal range.

One of the latest treatment modalities is to introduce insulin early.

Conventionally, healthcare providers start insulin therapy upon secondary failure of oral agents. However, if the insulin therapy is postponed, the insulin program must be more aggressive to achieve glycaemic value.

Fortunately, evidence has shown that early introduction of insulin treatment can be beneficial.

Some patients may worry that insulin will disrupt their daily activity and fear that low blood sugar could cause them to be unconscious. These are myths that need to be addressed appropriately.

Your doctor usually begins insulin therapy for patients with type 2 diabetes prescribing basal insulin combined with oral medications.

Basal insulin inhibits liver production of sugar and plays an important role in maintaining blood sugar level. This is especially useful when fixing high fasting sugar level and in between meals sugar level.

Studies have shown that one effective way to attain overall glycaemic control is to lower the fasting blood sugar level. Another golden step is to monitor blood sugar level effectively. Do not forget your healthy diet, exercise and lifestyle.

Recently, a new basal insulin (peakless long acting insulin analog) which provides 24-hour basal insulin has been shown to closely mimic the body’s natural release of insulin. It can be used with existing oral medication alone or with pre-food insulin.

Don’t delay. Contact your doctor or any diabetes educator for more information today!
Eat well, live well
Enjoy food and stay out of the diabetes danger zone

You deserve to feel good.
Now there’s something you can do about it.

The key to feeling good for most people is to keep their blood glucose levels:

- at 6.1 mmol/L or less before meals
- at 7.8 mmol/L or less 2 hours after meals*
- Check with your healthcare professional on what target range is best for you

* These suggested target levels are consistent with the goals published by the American College of Endocrinology consensus statement on guidelines for glycemic control.
Children, older people, pregnant women, and people with certain health problems may have different results.