

Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings 【Patient Version】

Prepared by the Task Force on Conceptual Model and Preventive Protocols of
the Working Group on Primary Care
Revised in February 2012



基層醫療
PRIMARY CARE



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Introduction

The ‘Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings’ was prepared by the Task Force on Conceptual Model and Preventive Protocols of the Working Group on Primary Care, which was set up by the Food and Health Bureau. This reference framework aims to provide a common reference for healthcare professionals across different sectors for the provision of continuing, comprehensive and evidence-based care for diabetes in the community. This reference framework also serves as a reference to adults at risk of developing or with Type 2 diabetes and their carers, to empower patients to take care of themselves and to raise public’s awareness on the importance of preventing and properly managing diabetes. This patient version is simple and easy to understand. It is hoped that patients are able to learn and practise the recommendations as laid down in this reference framework.

What is Type 2 diabetes?

The carbohydrates (including sugar and starch) which we take become glucose after digestion. It will then be absorbed by the small intestine and enter the blood circulatory system as blood glucose.

The function of insulin, which is secreted from the pancreas, is to control the blood glucose level of the body. When insulin secretion is insufficient or the insulin fails to function normally, the glucose in the blood will not be converted into the energy that human body needs, resulting in elevating blood glucose. Excess glucose will be passed out of the body through urine. Thus, it is called diabetes^{Note 1}. According to the World Health Organization, diabetes is defined as fasting^{Note 2} glucose equal to or higher than 7.0 mmol/L or the glucose level equal to or higher than 11.1 mmol/L two hours after meal. In Hong Kong, about one out of ten adults suffers from diabetes.

Type 2 diabetes (previously known as ‘non-insulin dependent diabetes’) is the most frequent form of diabetes and it mainly affects adults. It happens when body cells are resistant to insulin and thus cannot uptake and use glucose effectively and excess blood glucose is resulted. This type of diabetes is mainly related to the risk factors including genetic causes, unhealthy diet, obesity and lack of exercise.

Note 1 : Diabetes can be classified as the following four types according to its symptoms and causes: Type 1 diabetes, Type 2 diabetes, Gestational diabetes, and Secondary diabetes.

Note 2 : Fasting is defined as no food for 8 hours or above.

Risk factors for diabetes

There are different risk factors for developing diabetes at various stages of life, such as:

- age 45 or over
- overweight and obesity^{Note 3}
- history of impaired fasting glucose or impaired glucose tolerance^{Note 4}
- patients with metabolic syndrome^{Note 5}
- patients with hypertension (blood pressure at 140/90 mmHg or above)
- patients with cardiovascular diseases (e.g. coronary heart disease, peripheral vascular disease and stroke)
- presence of cardiovascular risk factors (e.g. hyperlipidaemia, low level of high density lipoprotein (HDL) cholesterol, high level of low density lipoprotein (LDL) cholesterol, smoking and lack of exercise)
- family history of diabetes, particularly in first degree relatives
- history of gestational diabetes or polycystic ovary syndrome (for women)
- on long-term steroid treatment

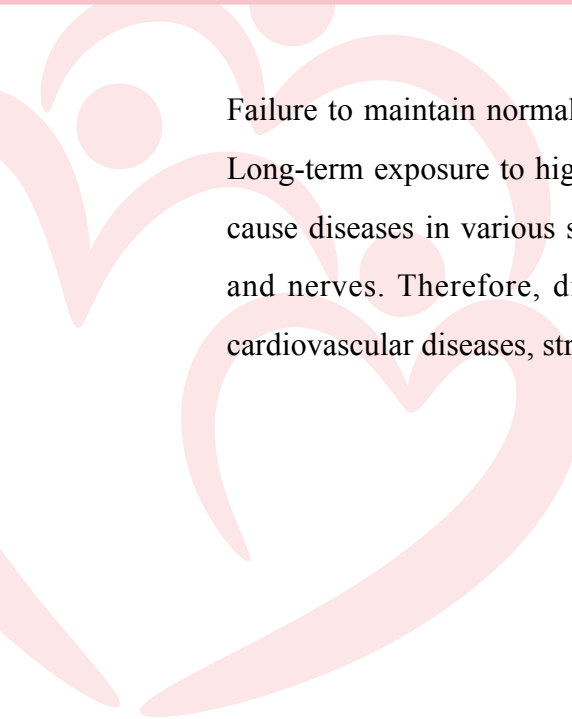
Most diabetic patients may not have any symptoms or signs at all. Therefore, those with risk factors are recommended to discuss with their family doctors and receive appropriate check-ups, for example once every three years, or more frequently depending on the risk factors, to avoid delayed diagnosis or treatment.

Note 3 : World Health Organization recommended Body Mass Index (BMI) cut-off points for overweight as 25 kg/m² and obesity as 30 kg/m² in 2004. For Asian populations, the BMI cut-off points of 23 kg/m² and 27.5 kg/m² were added as points for public health action. BMI is measured as weight in kg/height in m². Central obesity means the waist circumference ≥ 90 cm in male and ≥ 80 cm in female for the Chinese population.

Note 4 : Impaired fasting glucose and impaired glucose tolerance generally refer to the pre-diabetes state. Patients generally do not have any symptoms, but their blood glucose levels as shown in the fasting glucose value and glucose tolerance test are above the normal level but below the diabetes level.

Note 5: Metabolic syndrome refers to the condition when a number of risk factors of cardiovascular diseases exist. According to International Diabetes Federation, people with central obesity who also have any two risk factors of cardiovascular diseases (raised triglycerides, reduced HDL cholesterol, high blood pressure and raised blood glucose) are patients with metabolic syndrome.

Impacts of diabetes on health



Failure to maintain normal blood glucose level will result in high blood glucose level. Long-term exposure to high blood glucose levels may lead to vascular damages which cause diseases in various systems and organs including cardiovascular, retina, kidneys and nerves. Therefore, diabetes is the leading cause of kidney failure, blindness, cardiovascular diseases, stroke and lower limb ulcers.

How to live with diabetes?

There is no proven cure for diabetes. Therefore, in order to control diabetes and prevent its complications, you should adhere to the treatment plan:

- You should have knowledge about the **risk factors** of diabetes
- Your family doctor and other healthcare professionals can provide you with person-centred, continuing and comprehensive treatment and healthcare service. Therefore, you should develop a close partnership with them for early diagnosis and treatment
- You should also enhance your self-care ability for effective control of diabetes

How to know the blood glucose control status?

Glycated haemoglobin (HbA1c)

Information about blood glucose control in the last 2 to 3 months can be obtained through regular measurement of HbA1c. Optimal control of blood glucose (the optimal HbA1c level should normally be less than 7%) can effectively delay and prevent complications.

Fasting and postprandial blood glucose level

For more effective control of blood glucose level to reduce complications, doctors will advise diabetic patients to monitor blood glucose level regularly by themselves if necessary.

Urine glucose test

The urine glucose test is only a test for checking the level of glucose in urine. It does not accurately reflect the true blood glucose level or hypoglycaemia (abnormally low blood glucose level).

How to control diabetes?

Your participation and self-monitoring is crucial to the effective control of diabetes. Enhancing your knowledge and skills on the management of diabetes could enable you to better control your own health. Therefore, you should:

- understand the nature of diabetes
- maintain a healthy lifestyle
- keep optimal body weight
- understand that undesirable blood glucose control may lead to complications such as kidney diseases and diabetic eye diseases
- take oral medication(s) or inject insulin according to doctor's prescription
- consult your doctor to explain the treatment options and the possible side-effects of medication(s)
- develop a close partnership with your family doctor and other healthcare professionals so as to design a treatment plan that best suits your needs

Action	Recommendation
Follow up regularly with your family doctor	<ul style="list-style-type: none">• Work with your family doctor to set targets of treatment for blood glucose, blood pressure, blood lipid levels and BMI• Perform health assessment annually to check your health status and see whether any complication occurs. Recommended items for assessment include:<ul style="list-style-type: none">» BMI and waist circumference» blood pressure» blood glucose» blood lipid» kidney function test (including urine protein)» eye check-up» foot check-up» oral check-up

Action	Recommendation
<p>Develop healthy eating habit and follow the diet suggested by family doctor or dietitian for effective weight control</p>	<ul style="list-style-type: none"> ● Eat regular meals and regular portions <ul style="list-style-type: none"> » Avoid eating too little or too much to maintain a stable blood glucose level ● Maintain a balanced diet of various food <ul style="list-style-type: none"> » Select a variety of food from grains, vegetables, fruits, meat and dairy products in appropriate portions. Cut down on food high in fat, sugar and salt ● Eat more high fibre food <ul style="list-style-type: none"> » Frequent intake of high fibre food including oatmeal, whole wheat bread, dried beans, vegetables and fruits ● Use healthy cooking methods <ul style="list-style-type: none"> » Use low-fat cooking methods such as boiling, steaming, braising, casseroling, baking and stir-frying with little oil » Avoid using high-fat cooking methods such as pan-frying, deep-frying and frying with much oil » Remove the fat and skin of meat and poultry prior to cooking to reduce the intake of fat » Use natural seasoning such as ginger, green onion, garlic, pepper powder and dried tangerine skin. Avoid using lots of sugary seasoning such as white sugar, seafood paste and ketchup, etc » Reduce use of cornstarch, which is high in carbohydrates, in preparing gravies

How to control diabetes?

Action	Recommendation
<p>Develop healthy eating habit and follow the diet suggested by family doctor or dietitian for effective weight control</p>	<ul style="list-style-type: none">● Intake of food containing carbohydrates (e.g. starch, fructose and lactose) in appropriate portions<ul style="list-style-type: none">» Carbohydrates in food affect blood glucose levels and should be evenly distributed in daily meals to maintain a stable blood glucose level. When taking food containing carbohydrates, diabetic patients can apply ‘Carbohydrate Exchange System’ (see appendix) for exchange» Foods high in carbohydrates include grains, root vegetables, dried beans, fruits and dairy products» Diabetic patients can generally eat two portions of fruits every day. One portion of fruit is equal to one small orange or one small pear or one kiwi fruit. Diabetic patients can eat their favourite fruits in appropriate portions every day» Diabetic patients can also eat desserts if they know how to use the ‘Carbohydrate Exchange System’ and use artificial sweeteners in seasoning. For example, if they have already taken food high in carbohydrates such as sweet potatoes and red beans, they should reduce the amount of rice intake. It aims to avoid excessive intake of carbohydrates for the control of blood glucose» Consult healthcare professionals or dietitians for any questions on ‘Carbohydrate Exchange System’

Action	Recommendation
<p>Develop healthy eating habit and follow the diet suggested by family doctor or dietitian for effective weight control</p>	<ul style="list-style-type: none"> ● Follow own meal plan <ul style="list-style-type: none"> » Diabetic patients should not follow the meal plans of other patients because different people have different nutritional needs. They should seek advice from healthcare professionals » Pay attention to the values of fats, sodium (or salt) and sugar on nutrition labels. Choose food lower in fats, sodium (or salt) and sugar
<p>Perform physical activities regularly</p>	<ul style="list-style-type: none"> ● Perform aerobic exercise at moderate (e.g. brisk walking) or high intensity at least 3 days a week to reach the weekly target of at least 150 minutes in total ● Aerobic exercise can be performed accumulatively in bouts of at least 10 minutes each time ● Perform muscle strengthening activities at least twice weekly (on non-consecutive days) ● For more advice and information on exercise, please consult professionals or visit the Exercise Prescription website of the Department of Health (see appendix for website address)
<p>Reduce alcohol intake</p>	<ul style="list-style-type: none"> ● No more than 2 standard drinks daily for male ● No more than 1 standard drink daily for female ● A standard drink is approximately equal to: <ul style="list-style-type: none"> » 3/4 can (~250ml) of beer of 5% alcohol » One small glass (~100ml) of red wine of 12% alcohol » One pub measure (30 ml) of spirits of 40% alcohol
<p>Quit smoking</p>	<ul style="list-style-type: none"> ● Non-smokers should not try smoking and smokers should quit immediately ● If you need help to quit smoking, please see appendix

How to control diabetes?

Action	Recommendation											
<p>Control blood glucose</p>	<ul style="list-style-type: none"> ● Develop healthy eating habits and lifestyle ● Check blood glucose level regularly as a reference for treatment <table border="1" data-bbox="531 562 1353 837"> <thead> <tr> <th data-bbox="531 562 778 622"></th> <th data-bbox="778 562 1066 622">Items for assessment</th> <th data-bbox="1066 562 1353 622">Control target</th> </tr> </thead> <tbody> <tr> <td data-bbox="531 622 778 698" rowspan="2">Blood glucose level</td> <td data-bbox="778 622 1066 698">Fasting blood glucose value</td> <td data-bbox="1066 622 1353 698">4 to 7 mmol/L</td> </tr> <tr> <td data-bbox="778 698 1066 775">Blood glucose value 1 to 2 hours after meal</td> <td data-bbox="1066 698 1353 775">below 10 mmol/L</td> </tr> <tr> <td data-bbox="531 775 778 837"></td> <td data-bbox="778 775 1066 837">HbA1c</td> <td data-bbox="1066 775 1353 837">below 7% in general</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ● Start medications when indicated 		Items for assessment	Control target	Blood glucose level	Fasting blood glucose value	4 to 7 mmol/L	Blood glucose value 1 to 2 hours after meal	below 10 mmol/L		HbA1c	below 7% in general
		Items for assessment	Control target									
Blood glucose level	Fasting blood glucose value	4 to 7 mmol/L										
	Blood glucose value 1 to 2 hours after meal	below 10 mmol/L										
	HbA1c	below 7% in general										
<p>Control blood pressure</p>	<ul style="list-style-type: none"> ● Keep the target blood pressure lower than 130/80 mmHg to reduce the risk of developing complications ● Check blood pressure during every routine check-up for diabetes ● Optimal blood pressure control can be achieved by maintaining healthy eating habit and lifestyle as well as starting medications when indicated to delay and prevent complications 											
<p>Control blood lipid</p>	<ul style="list-style-type: none"> ● Blood lipids are mainly made up of triglyceride and cholesterol. Dyslipidaemia means abnormal high level of triglyceride or lipoprotein in the blood. It is a major risk factor for developing cardiovascular diseases ● Optimal blood lipid control can be achieved by maintaining healthy eating habit, performing exercise regularly, keeping LDL cholesterol below 2.6 and starting medications when indicated 											

Action	Recommendation
<p>Take oral medication(s) or inject insulin according to healthcare professionals' advice</p>	<ul style="list-style-type: none"> ● Understand clearly the medication(s) you take ● Understand why you are given the medication(s), how to take it and the possible side-effects. Consult your family doctor at once if you do not feel well after taking the medication(s). Never adjust the amount of medication(s) on your own or stop taking the medication(s) ● You should have knowledge about the symptoms of hypoglycaemia (e.g. sweating, tremor, palpitations, fatigue and agitation) and its management
<p>Receive influenza vaccination</p>	<ul style="list-style-type: none"> ● Receive influenza vaccination annually to reduce its complications. Seasonal influenza vaccination is recommended for persons with chronic medical problems due to their increased risk of complications and death associated with influenza infection.

How to control diabetes?

Action	Recommendation
<p style="text-align: center;">Prevent complications</p>	<p>Poor control of diabetes may lead to complications that affect quality of life and even take one's life. Prevention is necessary</p> <p>Hyperglycaemic coma</p> <ul style="list-style-type: none"> ● This occurs when blood glucose is very high, reaching 30 mmol/L ● Causes include: eating too much, failing to take medications or inject insulin according to instructions, during sick days or after a surgery ● Symptoms include: patients may have extreme thirst, less urine output and rapid heart beat. Serious patients may lose consciousness or fall into a coma ● Prevention: Comply with the principles of maintaining blood glucose level in diet and perform exercise. Take diabetic medications regularly. Consult doctors at once if urine glucose or blood glucose is too high <p>Hypoglycaemic coma</p> <ul style="list-style-type: none"> ● Hypoglycaemia means that the blood glucose is less than 4 mmol/L ● Causes include: imbalance between physical activity and eating (e.g. perform exercise during fasting), taking medications improperly or overdose of insulin and taking alcohol during fasting ● Symptoms include: feeling very hungry, rapid heart beat, hand tremor and sweating. Serious patients may fall into a coma or die ● Prevention: eat regular meals and regular portions, follow your doctor's instructions to take medications or inject insulin regularly, bring with you some food containing carbohydrates that can easily be absorbed such as candies and biscuits, so that you can eat them at once when symptoms of low blood glucose occur

Action	Recommendation
<p>Prevent complications</p>	<p>Diabetic kidney disease</p> <ul style="list-style-type: none"> ● Long-term exposure to relatively high blood glucose levels will cause damage to blood vessels of the body, including those of the kidney. It can cause kidney damage and kidney function will be affected. Most serious of all, it will cause kidney failure ● Prevention: control blood glucose, blood lipid and blood pressure properly, do not smoke, do regular exercise, and do annual check-up on kidney function, including urine protein test <p>Diabetic eye disease</p> <ul style="list-style-type: none"> ● Long-term exposure to very high blood glucose levels will cause damage to the tiny blood vessels on retina, leading to destruction of retina. Most serious of all, it will cause retinal detachment, resulting in blindness ● Prevention: control blood glucose and blood pressure properly, consult your family doctor when symptoms such as vision loss and eye pain or inflammation occur. Perform eye check-up annually for early detection and treatment <p>Cardiovascular diseases and stroke</p> <ul style="list-style-type: none"> ● Long-term exposure to very high blood glucose levels will step up the hardening of blood vessels. When the blood vessels supplying blood to the heart are affected, it will cause coronary heart disease. When the blood vessels supplying blood to the brain are affected, it will cause stroke ● Prevention: maintain the target blood pressure below 130/80 mmHg, control blood glucose and blood lipid properly, do not smoke and exercise regularly

How to control diabetes?

Action	Recommendation
<p data-bbox="279 1010 464 1084">Prevent complications</p>	<p data-bbox="531 394 708 427">Diabetic foot</p> <ul data-bbox="531 443 1356 1025" style="list-style-type: none"><li data-bbox="531 443 1356 815">● Long-term exposure to relatively high blood glucose levels will cause changes in nerve endings. This will lead to foot sensory loss resulting in inability to promptly identify foot problems. Further, when the blood vessels harden, blood supply to the foot will become insufficient, and so the wounds are difficult to heal. Most serious of all, it will cause the death of tissues, resulting in limb amputation in order to save one's life.<li data-bbox="531 824 1356 1025">● Prevention: learn proper foot care, observe the foot every day if there is any wound or ulcer, keep the foot clean, take good care of yourself in daily life to prevent foot injuries and tell your family doctor if you have any foot problem <p data-bbox="531 1099 708 1133">Periodontitis</p> <ul data-bbox="531 1149 1356 1563" style="list-style-type: none"><li data-bbox="531 1149 1356 1350">● Due to poor control of blood glucose, body's immunity will be weakened and the risk of gum infection by bacteria will be increased. Periodontitis is caused by the accumulation of dental plaque when diabetic patients fail to clean their mouth thoroughly<li data-bbox="531 1359 1356 1563">● Prevention: brush and clean teeth properly and thoroughly, in the morning and at night. Use toothbrush with soft bristles and fluoride toothpaste. Use dental floss or interdental brush to clean the adjacent surfaces of teeth and perform regular oral check-up <p data-bbox="531 1621 1356 1700">You will be referred to the relevant specialists for examination and treatment by your family doctor where necessary.</p>

Conclusion

To control diabetes effectively and prevent its complications, you are strongly advised to learn more about diabetes and its management. You should also develop a close partnership with your family doctor to manage the disease. For further information on the care of diabetes, please refer to the ‘Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings’ (see appendix for website address) or consult your family doctor.

Appendix

Useful Reference

Title	Source	Type
Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings	http://www.fhb.gov.hk/en/press_and_publications/otherinfo/101231_reference_framework/index.html	Publication
Exercise Prescription website of the Department of Health	http://exerciserx.cheu.gov.hk/en/index.asp	Website
Smart Patient website of the Hospital Authority – diabetes mellitus	http://www21.ha.org.hk/smartpatient/en/chronicdiseases_zone/details.html?id=98	Website
Living at Ease with Diabetes	Prepared by Elderly Health Service of the Department of Health	Book
Healthy Dining with Diabetes	Prepared by Elderly Health Service of the Department of Health	Book
Living Wisely with Diabetes	Prepared by Elderly Health Service of the Department of Health	DVD

Smoking Cessation Service

Service	Organisation	Telephone number
Integrated Smoking Cessation Hotline of the Department of Health	Department of Health	1833 183 (press 1)
Hospital Authority Quitline	Hospital Authority	1833 183 (press 3), 2300 7272
Women Smoking Cessation Service	The University of Hong Kong	2819 2692
Tung Wah Group of Hospitals Smoking Cessation Hotline	Tung Wah Group of Hospitals	1833 183 (Press 2), 2332 8977
Pok Oi Smoking Cessation Service using Traditional Chinese Medicine	Pok Oi Hospital	1833 183 (Press 4), 2607 1222

Carbohydrate Exchange System

Food type	Each contains 1 portion of carbohydrates
Grains	<ul style="list-style-type: none"> ● 1 full tablespoon of cooked rice ● 1 slice of small white bread (without bread crust) ● half slice of large white bread (without bread crust) ● 1/3 of a hard bun ● 2 tablespoons of dried oats ● 2 pieces of soda crackers (4 sections) ● 2 crackers ● 3 small tea biscuits
Dairy products	<ul style="list-style-type: none"> ● 1 cup of milk (240 ml) ● 4 level tablespoons of milk powder
Root vegetables / nuts	<ul style="list-style-type: none"> ● 1 piece of potato, taro, sweet potato (approximately equivalent to the size of an egg) ● 2 pieces of carrots, lotus roots (approximately equivalent to the size of 2 eggs) ● 1/3 of a corn on the cob ● 3 level tablespoons of corn kernels ● 2 chestnuts ● 4 level tablespoons of red beans/black-eyed peas/black beans (cooked) ● 1/3 bowl of soaked vermicelli (mung bean threads)
Fruits	<ul style="list-style-type: none"> ● 1 small orange ● 1 kiwi fruit ● 1/2 of medium apple/pear ● 1/2 small starfruit (carambola) ● 2 slices of pomelo ● 1/2 small banana/small plantain ● 1/3 medium mango ● 1/2 piece of durian (size of an egg) ● 10 small grapes ● half pound of water melon (with rind)

1 level bowl of cooked rice = 5 full tablespoons of cooked rice
 = 2 1/2 bowls of congee
 = 1 level bowl of rice noodles
 = 1 full bowl of noodles