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Centre for Health Protection

Non-Communicable Diseases Watch

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Health Tips

Hypertension is a 'silent killer', but the disease is preventable and treatable with regular blood pressure checks, adoption of healthy lifestyles, and working closely with the health care team for mapping out the best management plan and have regular follow-up if indicated.

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Department of Health

Healthy Lifestyles for Healthy Blood Pressure

Hypertension, or high blood pressure, is a chronic disease in which the blood pressure in the arteries is persistently elevated. Blood pressure is the force of blood pushing against the walls of the arteries as the heart pumps out blood. A normal blood pressure is required to push the blood through the body and supply oxygen and nutrients to the tissues. But if blood pressure rises and stays elevated over time, a number of serious health problems may ensue, including stroke, coronary heart disease and heart failure, chronic kidney disease, and even early death.

Blood pressure is written as two numbers. The first number (systolic pressure) represents the pressure in the blood vessels when the heart contracts to pump blood, whereas the second or bottom number (diastolic pressure) represents the pressure when the heart relaxes between beats. Blood pressure changes from minute to minute throughout the day with posture, physical activities, emotions, and sleep, etc. But for an adult, if systolic blood pressure (SBP) is persistently ≥ 140 millimetres of mercury (mmHg) or diastolic blood pressure (DBP) is persistently ≥ 90 mmHg, the person is said to have hypertension. SBP between 120 mmHg and 139 mmHg or DBP between 80 mmHg and 89 mmHg is considered pre-hypertension and should also be of concern. A child or adolescent is said to have hypertension if he or she has a SBP or DBP $\geq 95^{\text{th}}$ percentile for age, height and gender on repeated measurements.¹

Global Perspective

Hypertension is an important public health challenge worldwide because of its high prevalence. It also imposes enormous burden of morbidity and mortality to society and the health care system. Globally, around 40% of adults aged 25 and above had hypertension (SBP ≥ 140 mmHg or DBP ≥ 90 mmHg) in 2008.² In 2010, hypertension is the leading risk factor for global disease burden. It accounted for 7.0% of disability-adjusted life years (DALYs) and 9.4 million deaths worldwide.³

Local Situation

More and more people in Hong Kong are living with hypertension. Surveys conducted by the Census and Statistics Department showed that the proportion of people with known hypertension (as told by practitioners of Western medicine)

increased from 9.3% in 2008 to 10.3% in 2009/10 and 11.0% in 2011/12.^{4,6} Of note is that many adults in Hong Kong actually do not realise they have hypertension. A local large-scale cohort study released in 2012 revealed that among those with hypertension documented in the study (about 32% of adults aged 20 and above), only about half of them (46%) were ever diagnosed as hypertensive by a doctor. This territory-wide study also revealed that the management of hypertensive people is suboptimal. Among those ever diagnosed, 70% were prescribed blood pressure lowering medication, but only 42% of this treated group attained good control of blood pressure.⁷ The study confirmed the “rule of halves” in hypertension: roughly only half of all hypertensive cases are diagnosed, half of those diagnosed are treated, and half of those treated are well-controlled.

In 2011, there were over 18 000 in-patient discharges and deaths in public and private hospitals and 764 registered deaths due to hypertensive heart disease and hypertensive renal disease. As shown in Table 1, the burden of hypertension grows heavier with ageing: the prevalence of hypertension, the rate of in-patient discharges and deaths, and the rate of registered deaths due to hypertensive heart disease and hypertensive renal disease all increased sharply with age.^{8,9} If we take into account the other diseases that hypertension may cause, such as myocardial infarction and stroke (see Data Brief on page 10), the burden due to hypertension is actually higher. As the World Health Organization (WHO) estimates, 45% of coronary heart disease and 51% of stroke deaths are attributed to hypertension globally.¹⁰

Table 1: Disease burden of hypertension by age group, 2011

Age group	Had hypertension as told by practitioners of Western medicine		Episodes of in-patient discharges and deaths in public and private hospitals due to hypertensive heart disease and hypertensive renal disease		Registered deaths due to hypertensive heart disease and hypertensive renal disease	
	Number of persons ('000)	Rate*	Number of episodes	Rate [#]	Number of deaths	Rate [#]
44 and below	25.4	0.7	2 075	53.0	5	0.1
45-64	300.8	13.8	6 023	272.3	52	2.4
65 and above	413.8	46.0	10 249	1 088.7	707	75.1
Total	739.9	11.0	18 347	259.4	764	10.8

Notes: * As a percentage of all persons in the respective age group.

[#] Per 100 000 population of the respective age group.

Sources: Department of Health, Hospital Authority and Census and Statistics Department.

Beware of the Risk Factors of Hypertension

A number of risk factors predispose a person to develop hypertension. For example, people with a family history of hypertension are at a higher risk of developing hypertension than those without, and the older a person, the higher the risk. While both family history and age cannot be changed, some other lifestyle-related risk factors of hypertension are **modifiable**, including:

High salt (sodium) intake in the diet

Observational and intervention studies in humans have shown that excessive salt intake is a major factor contributing to the development of hypertension: the higher the salt intake, the higher the risk of hypertension. A study found that normotensive people who were in the highest quartile of sodium intake had a 21% increased risk of developing hypertension compared to those in the lowest quartile.¹¹

Sedentary lifestyle and obesity

A sedentary lifestyle, which can lead to poor exercise tolerance, obesity and a weaker heart, plays a significant role in developing hypertension. Studies have shown that sedentary and unfit individuals with normal blood pressure have a 20% to 50% higher risk of developing hypertension than those who are more active¹², whereas being obese is associated with a 2- to 3-fold increase in the risk of developing hypertension.¹³ Among Chinese adolescents, a local study showed that large waist circumference ($\geq 85^{\text{th}}$ percentile) increased the risk of hypertension by 2.4 fold.¹⁴

Smoking

Cigarette smoking causes a rise in blood pressure plausibly through activating the sympathetic nervous system and stiffening the arteries. Compared to never smokers, the risk of past

smokers and current smokers developing hypertension was 8% and 15% higher respectively.¹⁵ A prospective study in women found that the more the cigarettes smoked per day, the higher the risk. Women who smoked 15 or more cigarettes per day had 11% increased risk of hypertension than women who never smoked. Women who smoked 25 or more cigarettes per day had 21% increased risk.¹⁶

Drinking

A recent meta-analysis of 16 studies on the link between drinking and hypertension concluded that heavy alcohol consumption is significantly associated with increased risk of hypertension in both men and women. Compared with non-drinking men, men with heavy alcohol consumption of 31g or more pure alcohol per day had 61% to 77% increased risk of developing hypertension; compared with non-drinking women, women with heavy alcohol consumption of 31 to 40 g pure alcohol per day had 19% increased risk of hypertension.¹⁷

Stress

Long standing stress may put people at risk for hypertension as well. A study showed that middle-aged men with very high levels of anxiety had about 2.2 times the risk of developing hypertension compared to those without tension symptoms.¹⁸

Lack of sleep

Losing even a few hours sleep can raise the risk for high blood pressure. A systematic review and meta-analysis on sleep duration found that short sleep duration was associated with a 33% increased risk of developing hypertension among people younger than 65 years.¹⁹

Watch Out for Hypertension, Have Regular Blood Pressure Checks

Hypertension is a ‘silent killer’ because it rarely causes any symptom until considerable organ damage has occurred. Getting regular, accurate blood pressure readings is therefore essential for detecting the problem early. Healthy adults aged 18 or above should have their blood pressure checked at least once every two years (Box 1).²⁰ More frequent blood pressure monitoring may be required according to the blood pressure level, individual’s age, overall cardiovascular risk profile, and doctor’s advice.^{12,21,22}

While having regular blood pressure checks allows early detection and monitoring of hypertension (Box 2 and Box 3), adopting a healthy lifestyle is essential for preventing and controlling hypertension (Box 4). All patients with hypertension should have appropriate lifestyle changes, regardless of their blood pressure level. For those with mildly elevated blood pressure, sometimes following a healthy lifestyle may be adequate to bring down the blood pressure to a normal level.

For those with moderate to severe hypertension, drug treatment is usually necessary to lower blood pressure and the risk of complications. Clinical trials have demonstrated that antihypertensive medications could reduce the risk of stroke by 35% to 40%, the risk of myocardial infarction by 20% to 25%, and the risk of heart failure by over 50%.^{1,29} Once drug treatment is started, it is of utmost importance that patients take the medication(s) as directed, have regular follow-up, and work closely with the health care team to map out a customised management plan. For further information on the prevention and care of hypertension, please refer to the “[Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings \(Patient Version\)](#)” developed by the Task Force on Conceptual Model and Preventive Protocols under the Working Group on Primary Care.

Box 1: Categories of blood pressure levels in adults and recommended follow-up actions

<u>Category</u>	<u>Systolic pressure (mmHg)</u>	<u>Diastolic pressure (mmHg)</u>	<u>Recommended follow-up actions</u>
Normal	< 120	< 80	Recheck within 2 years
Pre-hypertension	120 - 139	80 - 89	Recheck within a year
Hypertension	≥ 140	≥ 90	Consult your family doctor for advice

Box 2: Tips on how to choose digital automatic blood pressure monitors for measuring blood pressure at home^{20,23}

Checking your blood pressure at home is an important part of monitoring blood pressure and managing hypertension. There are many easy-to-use digital automatic blood pressure monitors in the market. Here are some tips on how to choose blood pressure monitors -

Arm or wrist monitor:

The common digital monitors can be fitted on the upper arm or the wrist. Upper arm devices should preferably be used as they are more accurate. Wrist monitors may be used by people for whom a large upper arm cuff is too small or cannot be used because of shape or pain from the pressure of the cuff when it inflates. Talk to a doctor or qualified health care provider about which blood pressure monitor is right for you. Devices that measure blood pressure at the finger are not recommended.

Cuff size:

Blood pressure cuffs of upper arm devices come in different sizes. The wrong cuff size will give incorrect readings: using a cuff that is too small for the arm will overestimate blood pressure and one that is too big will underestimate it. So make sure the cuff size fits your arm. The cuff should be wide enough to cover two thirds of the upper arm and its length should be long enough to encircle the whole arm. Most monitors will come with medium-sized cuffs which suit most adults. People with large arm or overweight people may need bigger cuff. You may seek advice from your doctor or the supplier of the blood pressure monitor.

Validation of monitor:

Make sure the monitor you choose has been clinically validated for accuracy. Read the manual carefully and operate the device according to the manufacturer's instructions. It is not uncommon for blood pressure readings taken at home to be different from those taken at your doctor's office. If the blood pressure monitor is not too bulky, it is a good idea that you bring it along to your doctor's appointment. Your doctor can help validate your monitor's accuracy.

Box 3: Tips on how to accurately measure blood pressure at home^{20,23}

Blood pressure measurements taken casually, without following standard procedures, produce unreliable results. Imprecise measurements, even those that are off by just a few points, can lead to inappropriate treatment. So it is important to get accurate blood pressure readings. Here are some tips on how to get accurate readings -

When to measure:

- * Follow your doctor's instruction. Measuring blood pressure at around the same time each day facilitates assessment of treatment effect, but sometimes you need to check your blood pressure several times during the day to give a more accurate picture of the overall situation.
- * Do not measure blood pressure when you feel unwell, cold, anxious, stressed, in pain, or have a full bladder.

Before recording:

- * Do not exercise, smoke or consume foods or drinks containing caffeine (such as tea or coffee) at least 30 minutes before measurement.
- * Remember to wear loose-fitting clothes.
- * Rest and relax for 5 minutes without distractions (e.g. watching television).

Arm position:

- * Be seated comfortably with the back supported.
- * Push up the sleeve to bare your upper arm and wrap the cuff around your upper arm.
- * Make sure your arm is supported and your upper arm is at the same level as your heart.
- * Keep feet on the floor and do not cross legs.

Recording:

- * Relax and do not talk while taking the reading.
- * Take the average value of at least two readings. After the first measurement, release cuff pressure completely and repeat the same steps to obtain another reading of blood pressure. The two measurements should be taken at least 1 minute apart.
- * If the first two readings differ by more than 5 mmHg, additional readings should be obtained before taking the average.

Record down the readings to obtain a continuous monitoring.

- * Consult a doctor or a nurse if you have any concerns.

Box 4: Some actions to prevent and control hypertension

Cut back on salt. Studies have shown that reducing salt intake is one of the most effective ways to prevent high blood pressure, which in turn substantially reduces the risk for developing cardiovascular disease and kidney disease. A study showed that salt restriction by 4.4 g per day could reduce SBP by 2 mmHg in normotensive individuals, and salt restriction by 4.6 g per day could reduce SBP by 4 - 5 mmHg in hypertensive individuals.²⁴ The WHO recommends that healthy adults should consume less than 5 grams of salt (approximately one level teaspoon of salt) per day. Children should consume less salt than adults according to their size, age and energy needs.²⁵

Consume a DASH diet (Dietary Approaches to Stop Hypertension) that is rich in fruit and vegetables with appropriate amounts of whole grain products, fish, poultry or lean meat, nuts and beans, and low-fat or fat-free dairy products. Avoid foods and beverages that are high in fat, salt, sugar and cholesterol.²⁶

Be active and avoid prolonged sitting. A systematic review and meta-analysis showed that endurance training could induce a significant reduction in daytime SBP by 3.2 mmHg and daytime DBP by 2.7 mmHg.²⁷ As the WHO recommends, adults should do at least 150 minutes of moderate-intensity physical activity or 75 minutes of vigorous-intensity physical activity, or equivalent amounts throughout the week. Children and young people, on the other hand, should accumulate at least 60 minutes of moderate to vigorous-intensity physical activity daily. Inactive persons should start to build up a regular exercise regimen gradually.

Maintain an optimal body weight and waistline. Every 1% reduction in body weight lowers SBP by 1 mmHg on average.²⁸ Asian adults should aim to maintain a body mass index (BMI) between 18.5 and 22.9. Irrespective of their BMI, Asian men should keep their waist circumference below 90 cm (~ 36 in) and Asian women should keep theirs below 80 cm (~ 32 in).

Do not smoke. Quitting smoking markedly reduces overall cardiovascular risk. Those who want to quit smoking can call the Integrated Smoking Cessation Hotline of the Department of Health at 1833 183 for free advice and help, or visit the website of the Tobacco Control Office at <http://www.tco.gov.hk/eindex.html> to download the free Quit Smoking iPhone or Android App.

Avoid alcoholic drinks. If you must drink alcohol, limit its intake to minimise alcohol-related harm.

Manage stress with healthy coping strategies, such as practising yoga, Tai Chi or deep breathing. Seek help from family and friends or health professionals if necessary. **Ensure enough sleep** and rest.

Take medication as directed, if you have hypertension. Understand what the medication is for, how and when to take it. Take your medication as directed by the doctor.

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World Health Day

7 April 2013

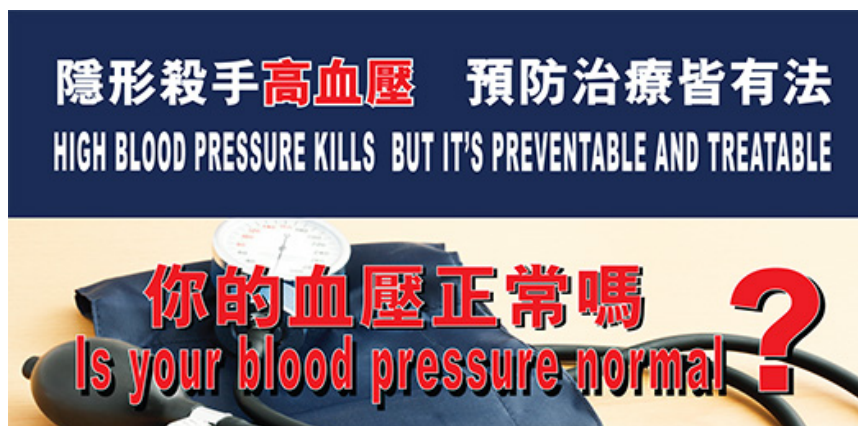
High Blood Pressure

World Health Day is celebrated on 7 April to mark the anniversary of the founding of World Health Organization in 1948. Each year a theme is selected for World Health Day that highlights a priority area of public health concern in the world.

For 2013, the theme is high blood pressure. The ultimate goal of World Health Day 2013 is to reduce heart attacks and strokes. To know more about the World Health Day and past events, please visit its <http://www.who.int/world-health-day/en/>.

To echo the World Health Day 2013 - High Blood Pressure, the Department of Health of Hong Kong is collaborating with partners in the health and care sector to launch a media and public education campaign from April 2013 onwards with objectives to raise awareness, promote healthy behaviours, motivate self-care and early detection, as well as create supportive environments for prevention and control of high blood pressure.

Please stay tuned for that, or visit the thematic website at http://www.chp.gov.hk/en/view_content/28258.html for more information and updates.





Data Brief

High blood pressure is a leading cause of myocardial infarction (heart attack) and stroke. In 2011, there were over 6 800 in-patient discharges and deaths in public and private hospitals and more than 1 800 registered deaths due to myocardial infarction in Hong Kong. Meanwhile, there were over 26 400 in-patient discharges and deaths in public and private hospitals and more than 3 300 registered deaths due to stroke.

Age group	Number (Rate*) of Episodes of in-patient discharges and deaths in public and private hospitals		Number (Rate*) of Registered deaths	
	Myocardial infarction	Stroke	Myocardial infarction	Stroke
44 and below	235 (6.0)	1 177 (30.0)	46 (1.2)	57 (1.5)
45-64	1 941 (87.7)	6 951 (314.2)	312 (14.1)	428 (19.3)
65 and above	4 679 (497.0)	18 359 (1 950.2)	1 487 (158.0)	2 853 (303.1)
Total[#]	6 855 (96.9)	26 487 (374.6)	1 846 (26.1)	3 339 (47.2)

Notes: * Per 100 000 population of the respective age group.

[#] Total included one registered death due to myocardial infarction and one registered death due to stroke with unknown age.

Sources: Hospital Authority, Department of Health, and Census and Statistics Department.

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