Guidelines for Integrated Management of Cardiovascular Diseases and Diabetes in Clinics and Ri-hospitals

Ministry of Public Health

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Rationale

Noncommunicable diseases such as cardiovascular disease (CVD) and diabetes (DM) are leading cause of disability and premature death in the world. The underlying causes of the disease are hypertension, atherosclerosis, high blood glucose and cholesterol, which develop over long duration and are usually advanced by the time symptoms occur, generally in middle age. Acute coronary events (heart attacks) and cerebrovascular events (strokes) frequently occur suddenly, and are often fatal before medical care can be given.

Risk factor modification, such as quitting smoking, avoiding harmful use of alcohol, healthy diet and physical activity, can reduce clinical events and premature death in people with established CVD and DM as well as in those who are at high cardiovascular risk due to one or more risk factors.

WHO innovated Package of Essential Noncommunicable disease interventions in low-resource settings (WHO PEN) which is an innovative and cost-effective approach to integrated management of CVD and DM in primary health care settings with WHO/ISH risk prediction chart and protocols.

In line with this WHO innovation, Ministry of Public Health developed national guidelines on integrated management of CVD and DM for piloting programme of WHO PEN in local areas.

Integrated management of cardiovascular disease and diabetes in PHC level

Target community: All population aged 35 years and above.

1. Household visit

Household doctor visits every household in his charge. He counsels and examines family members with below protocols and records findings in health screening record card (Annex1). High risk group people determined by the visit is requested to refer to the clinic where further examination and treatment are served by HH doctors.

1.1 Counseling

- Known/diagnosed hypertension, CVD, stroke, DM and kidney disease: If yes, refer to clinic for further exam.
- Angina, breathlessness on exertion and lying flat: Refer to clinic.
- Loss of weight, increased thirst, polyuria, nocturia, puffiness of face, swelling of feet: Refer to clinic.

- Current tobacco smoking. (frequency and amount)
- Alcohol consumption. (amount/day)
- Occupation (sedentary or active)
- Engagement in more than 30 minutes of physical activity per day
- Food preferences: vegetables, meat, oily food, sweet food, salty food, etc
- Family history of CVD, DM or kidney disease in first degree relatives.

1.2 Health advice

① Quitting smoking

- Advise him and his family on harms of smoking as well as second-hand smoking and its harmful impact to individual and social development.
- Strongly recommend all smokers to quit smoking in strong, decisive and preferred manner with saying that “Smoking increases risk of developing a heart attack, stroke, lung cancer and respiratory diseases. Quitting smoking is only option you can prevent fatal disease for yourself, your children and your family.”

② Avoiding harmful use of alcohol

- Explain harmful impact of alcohol for individual and community.
- Advise to quit or reduce drinking to less than 3 units of alcohol per day.

③ Healthy diet

- Recommend to reduce total rice intake to 300-400g daily and encourage low-fat food to prevent overweight and obesity.
- Recommend to restrict salt intake to less than 5 grams(1 teaspoon) per day.
- Advise to limit processed and fast foods which might include a lot of saturated fat or trans-fat.
- Encourage intake of fruits and vegetables: 5 servings (400-500g) daily
- Encourage white meat (fish) and bean rather that red meat (pork, beef)

④ Physical activity

- Recommend moderate intensity activity (such as brisk walking, running, cycling,

swimming, collective aerobic exercise, Taekwon-Do, etc) at least 30 minutes per day.

- Encourage various sport activities such as table tennis, tennis, volleyball, basketball, etc.

⑤ Hypertension

- Explain on dangers of hypertension which will eventually lead to severe complications (heart attacks and strokes). Advise patients of hypertension to check blood pressure regularly and keep contact with his doctor. It is important to maintain blood pressure below 140/90mmHg under supervision of his doctors.

⑥ Diabetes

- Diabetes can increase the risk of CVD events and lead to several complications including organ damages. It is important to check and control glucose level on a regular basis under his doctor's supervision.

1.3 Physical examination

- Waist circumference

  >=80cm in women and >=90cm in men: High risk group and refer to clinic.

- Body mass index(BMI)

  BMI(kg/m^2) = Body weight(kg)/Height^2(m^2)

  BMI>=23: Overweight,

  BMI>=25: Obesity: High risk group and refer.

- Blood pressure (BP)

  BP>=160/100mmHg: High risk group and refer.

- Auscultation

  Heart murmurs in heart and crackling rales in lung: High risk group and refer.

- In diabetes patients, examine feet for followings:

  Change of color, muscular atrophy, asymmetry in pulses, sensations and temperatures

1.4 Urine examination

- Urine sugar test

  If positive, refer to clinic.

- Urine albumin test

  If positive, refer to clinic.

1.5 CVD risk assessment with WHO/ISH risk prediction chart

- Assess the risk level with parameters of age, gender, smoking status, systolic blood pressure, DM and blood cholesterol(5mmol/l) and record.

  Risk<10%: low risk

  Risk 10 to <20%: moderate risk

  Risk 20 to <30%: high risk

  Risk >30%: very high risk

- Low and moderate risk group are advised on lifestyle modifications especially quitting smoking and avoiding harmful use of alcohol, and reassessed every year.
- High risk group are recommended to refer to clinic for further examination and treatment under supervision of HH doctors and specialists.

2. Management in clinic

Referral criteria:

- High CVD risk
- BP>=160/100mmHg
- Known/diagnosed hypertension, heart disease, stroke, DM, kidney disease
- New chest pain or change in severity of angina, breathlessness
- Weight loss, increase of thirst, polyuris, nocturia
- Cardiac murmurs and lung crackling rales
- Raised BP>=140/90mmHg (in DM above 130/80mmHg) while on treatment with 2 or 3 agents

2.1 Re-examination in clinic

- All clients referred are registered in high risk group card.
- They are provided further exam and management by HH doctors and followed up every 3 months for reassessment and examination.

- Counseling and physical examination mentioned above are done again by HH doctors.
- Laboratory exam
  - Blood sugar

    Examine fasting and random blood sugar and record.

    Diabetes: fasting blood sugar (FBS)>=7mmol/l (126mg/dl) or
    random blood sugar (RBS)>=11.1mmol/l (200mg/dl)
  - Total blood cholesterol

    Examine fasting blood cholesterol and record.

    Total blood cholesterol >= 5mmol/l(192.5 mg/dl): lifestyle modifications strongly recommended with statin treatment.

2.2 Treatment and follow up

Treatment with CVD risk

- Risk<20%
  - Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol.
  - Follow up in 12 months.
- Risk 20-<30%
  - Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol.
  - Persistent BP>=140/90mmHg, consider antihypertensive medications.
  - Follow up every 3 months.
  - Give metformin 250-500mg per day if the value of FBG or function of glucose control is not normal.
- Risk>30%
  - Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol.
  - Combine antihypertensive and antidiabetic for DM with BP>=130/80mmHg.
  - Give a statin.
  - Give low-dose of aspirin (80~100mg/d).
  - Follow up every 3 months. If there is no reduction in CVD risk after 6 months of

follow up, refer to next level.

Medications

- **Antihypertensive drugs**
  - Low dose of thiazide diuretics, CCBs, ACE inhibitors can be prescribed. Increase the dose of drugs or combine more than 2 different drugs if BP remains high.
  - ACE inhibitor should not be indicated to pregnancy and she needs to consult the specialist for treatment of hypertension.
- **Hypoglycaemic drugs**
  - Give an antihypertensive for those with BP>=130/80mmHg. ACE inhibitors are recommended as a first-line treatment of hypertension.
  - Give metformin 500-750mg a day for type 2 DM if not controlled by diet only (FBS>=7mmol/l(126mg/dl)).
  - Give a statin to all with type 2 DM aged >=40 years.
  - Give a sulfonylurea to patients who have contraindications to meformin or if metformin does not improve glycaemic control.
- **Lipid lowering drugs** (Statin)
  - If total blood cholesterol value is above 6.6mmol/l(250mg/dl), lifestyle modifications are strongly advised with statin treatment.

3. Referral to a specialist facility

- Referral criteria:
  - BP remains high above 140/90mmHg(for DM, above 130/80mmHg) though more than 3 different antihypertensive drugs are used for more than a week.
  - Established CVD, stroke, kidney disease.
  - Albumin positive in urine albumin test.
  - Newly diagnosed or uncontrolled DM with complications.
- Urgent referral with followings:
  - Heart attack
  - Stroke
  - Unconsciousness

- Hypoglycaemia
- Severe asthma or CRD

Drugs and daily dosages

Class		Drug	Daily dosage
Antihypertensive	Thiazide diuretics	Hydrochlorothiazide (tablet 25mg)	Initial: 12.5mg once daily Maintain: 25mg once daily
	CCBs	Sustainable-released nifedipine (Adalat, tablet 20mg)	Initial: 20mg once daily Maximum: 20mg twice daily
		Amlodipin (tablet 5mg)	Initial: 5mg once daily Maximum: 10mg once or twice daily
	ACE inhibitors	Enalapril (tablet 5mg)	Initial: 2.5-5mg once daily Maintain: 10mg once daily Maximum: 10mg twice daily
		Captopril (tablet 25mg)	Initial: 12.5mg three times daily Maintain: 25-50mg three times daily
	Angiotensin-Ⅱ receptor blockers	Rosartan (tablet 25mg)	Initial: 12.5mg once daily Maintain: 25mg twice daily
	Beta-blockers	Atenolol (tablet 50mg)	Initial: 25mg once daily Maintain: 50mg twice daily
Lipid lowering drugs		Simvastatin (tablet 10, 20, 40mg)	Initial: 10-20mg once daily at night Maximum: 40mg once daily at night
Anti-platelet drugs		Aspirin (tablet 100mg)	75-100mg once daily for prevention of CVD 100mg for treatment of acute cardiac infarction, acute ischemic attacks
Hypoglycaemic drugs		Glibenclamide (tablet 2.5mg)	Initial: 2.5mg once daily before meal Maintain: 5mg twice daily
		Metformin (tablet 500mg)	Initially 500mg with breakfast for at least 1 week then 500mg with breakfast and evening meal for at least 1 week, then 500mg with breakfast, lunch, and evening meal or 850mg every 12 hours with or after food; usual maximum, 2g daily in divided doses.

Annex 1

Health screening record

Clinic_____

Name_____ Sex_____ Age_____

Occupation_____ Address_____

Referral: Yes (Appointment date)_____ No:

1. Counseling

Have you been diagnosed one of follwoings? • Acute cardiac infarction • Angina/Ischemic heart disease • Stroke • TIA • DM • Kidney diseas	Tick as appropriate. Yes(Refer) No
Have you experienced breathlessness or angina on exertion or relaxation?	Yes(Refer) No
Have you experienced weight loss, increasing thirst, polyuria, nocturia, puffy face and feet swelling?	Yes(Refer) No
Do you smoke? How often?	Yes(Amount) No
Do you drink alcohol? How often?	Yes(Unit) No
Occupation?	➢ Sedentary ➢ Active
Have you taken antihypertensive drugs?	Yes(Refer) No
How often do you eat vegetables or fruits?	Yes No
Have you experienced high blood glucose or positive in urine sugar?	Yes(Refer) No
Are you engaged in physical activity more than 30 minutes daily?	Yes No
Is there any patient or premature death in your first degree relatives due to CVD, stroke or DM?	Yes(Refer) No

2. Physical examination

Waist circumference (cm)	cm
BMI(kg/m^2)	kg/m^2
BP(systolic/diastolic)	mmHg
Heart sound (heart murmur?)	Yes(Refer) No
Lung sound (rales?)	Yes(Refer) No
Abnormal findings in DM?	Yes(Refer) No

3. Urine examination

Urine glucose test If positive, refer.	Result: －; ＋; ＋＋; ＋＋＋
Urine albumin test If positive, refer.	Result: －; ＋; ＋＋; ＋＋＋

4. Assessment of CVD risk

Assess CVD risk using WHO/ISK risk prediction chart and record. Refer high risk group.	➢ <10% Low risk ➢ 10%~<20% Moderate risk ➢ 20% ~<30% High risk ➢ ≧30% Very high risk

Sign of HH doctor in charge_____

Visiting date _____

Annex 2

High risk group record and management (Reassess and follow up every 3 months)

Criteria		Visit 1(date)	Visit 2(date)	Visit 3(date)	Visit 4(date)	Remarks
10-year CVD risk						
➢ <10% Low risk						
➢ 10% ~< 20% Moderate risk						
➢ 20% ~<30% High risk						
➢ ≧30% Very high risk						
Symptoms	Weight loss					
	Increasing thirst					
	Polyuria(times and amount)					
	Nocturia(times and amount)					
	Breathlessness					
	Angina					
Physical exam	Abnormal findings in sound of heart and lung					
	Abnormal findings in DM feet					
	BP(systolic/diastolic)	mmHg	mmHg	mmHg	mmHg	

	Waist circumference	cm	cm	cm	cm	
	BMI(kg/m^2)	kg/m^2	kg/m^2	kg/m^2	kg/m^2	
Lab	Urine sugar					
	FBS(mmol/L)	mmol/L	mmol/L	mmol/L	mmol/L	
	RBS(mmol/L)	mmol/L	mmol/L	mmol/L	mmol/L	
	Blood cholesterol(mmol/L)	mmol/L	mmol/L	mmol/L	mmol/L	
	Urine albumin					
Antihypertensive drugs used						
Hypoglycaemic drugs used						
Diet status						
Amount of cereals intake a day						
Vegetables or fruits intake(g)						
Meat taken(g)						
Salt intake(g)						
Snacks or sweets intake						
Physical activity status						
Physical activity more than 30						

minutes daily					
Brisk walking					
Other exercises					
Smoking status Amount of smoking daily					
Health education provided					

Treatment						
Prescription		Visit 1(date)	Visit 2(date)	Visit 3(date)	Visit 4(date)	Remarks
Antihypertensive drugs	Thiazide diuretics					
	CCBs					
	ACE inhibitors					
	Angiotensin					

	Ⅱ-receptor blockers					
	Beta-blockers					
Lipid lowering drugs						
Anti-platelet drugs (Aspirin)						
Hypoglycaemic drugs						
Traditional medicine						

Others					
Referral to next level (date, diagnosis)					
Feedbacks provided to PHC level from higher level					