WHO Tools for management of diabetes and cardiovascular disease risk

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Technical package for cardiovascular disease management in primary health care
WHO PEN 2020

- Comprehensive
- Algorithm based
- Updated CVD section aligned to HEARTS-R
- Adaptation guide
- Indicators
Package of the essential WHO interventions to reduce CVD morbidity and mortality
HEARTS

Technical package for cardiovascular disease management in primary health care

Evidence-based treatment protocols
LIFESTYLE MANAGEMENT ADVICE FOR ALL PATIENTS

- Stop all tobacco use, avoid secondhand tobacco smoke.
- Drink no more than two units of alcohol per day and do not drink on at least two days of the week.
- Increase physical activity to equivalent of brisk walk 150 minutes per week.
- If overweight, lose weight.
- Eat heart-healthy diet:
  - Eat a low-salt diet.
  - Eat ≥5 servings of vegetables/fruit per day.
  - Use healthy oils (e.g. olive, safflower).
  - Eat nuts, legumes, whole grains and foods rich in potassium.
  - Limit red meat to once or twice a week at most.
  - Eat fish or other food rich in omega 3 fatty acids (e.g., flax seeds) at least twice a week.
  - Avoid added sugar from cakes, cookies, sweets, fizzy drinks and juice.
<table>
<thead>
<tr>
<th>Class</th>
<th>Medication</th>
<th>Starting dose</th>
<th>Intensification dose</th>
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<tbody>
<tr>
<td>diuretic*</td>
<td>chlorthalidone®</td>
<td>12.5 mg</td>
<td>25 mg</td>
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<td>thiazide-like</td>
<td>or Indapamide SR®</td>
<td>1.5 mg</td>
<td>stay at 1.5 mg</td>
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<tr>
<td>ACE Inhibitor*</td>
<td>lisinopril</td>
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<td>40 mg</td>
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<tr>
<td>(angiotensin-</td>
<td>ramlipril</td>
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<td>perindopril</td>
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<td>CCB (calcium channel</td>
<td>amlodipine</td>
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<td>10 mg</td>
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<td>blocker)</td>
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</tbody>
</table>
HYPERTENSION PROTOCOL
Diuretic as first-line treatment

**Step 1**
Screen all adults

**Step 2**
IF $\geq 140$ or $\geq 90^*$
Prescribe thiazide-like diuretic**

After one month

**Step 3**†
IF still $\geq 140$ or $\geq 90$
Add starting dose of ACE-I or ARB‡

After one month

**Step 4**
IF still $\geq 140$ or $\geq 90$
Increase to full dose of ACE-I or ARB

After one month

**Step 5**
IF still $\geq 140$ or $\geq 90$
Add starting dose of CCB

After one month

**Step 6**
IF still $\geq 140$ or $\geq 90$
Increase to full dose of CCB

After one month

**Step 7**
IF still $\geq 140$ or $\geq 90$
Check that patient has been taking drugs regularly and correctly – IF this is the case, refer patient to a specialist

**Provision for Specific Patients**

- This protocol is contraindicated for women who are or could become pregnant.
  - Manage diabetes as indicated by national protocol.
  - Aim for BP $<130/80$ for people at high risk, such as individuals with diabetes, CAD, stroke, or CKD.
HYPERTENSION PROTOCOL
ACE-I or ARB* as first-line treatment

step 1
SCREEN ALL ADULTS

step 2
IF ≥140 or ≥90”
PRESCRIBE starting dose of ACE-I or ARB***

step 3
After one month
IF still ≥140 or ≥90
INCREASE to full dose of ACE-I or ARB

step 4
After one month
IF still ≥140 or ≥90
ADD starting dose of CCB

step 5
After one month
IF still ≥140 or ≥90
INCREASE full dose of CCB

step 6
After one month
IF still ≥140 or ≥90
ADD thiazide-like diuretic

step 7
After one month
IF still ≥140 or ≥90
CHECK that patient has been taking drugs regularly and correctly – IF this is the case, REFER patient to a specialist

PROVISION FOR SPECIFIC PATIENTS

THIS PROTOCOL IS CONTRAINDICATED FOR WOMEN WHO ARE OR COULD BECOME PREGNANT.

- Manage diabetes as indicated by national protocol.
- Aim for BP <130/80 for people at high risk, such as individuals with diabetes, CAD, stroke, or CKD.
Additional treatment to consider

Lipid control
• **Statins** for survivors of a CVD event or otherwise high risk of CVD

Antiplatelet treatment
• 75-100 mg of acetylsalicylic acid daily for survivors of a CVD event who have no history of major bleeding
HEARTS

Technical package for cardiovascular disease management in primary health care

Risk-based CVD management
Using the WHO CVD risk (lab-based) charts

1. Select the regional chart covering your country. Countries included in each region can be found in HEARTS R MODULE.
2. Select the section of the chart as relevant for people with or without diabetes.
3. Select men or women table as appropriate.
4. Select smoker or non-smoker box.
5. Select age group.
6. Within the selected box find the cell where the individual’s systolic blood pressure (SBP) and total blood cholesterol intersect.
7. The colour of the cell indicates the 10-year risk of a fatal or non-fatal cardiovascular event. The value within the cell is the risk percentage. Colour coding is based on the grouping as indicated in the box.
8. Counsel, treat and refer according to risk level.

* Fasting plasma glucose ≥ 7.0 mmol/L (126 mg/dL), or 2-h plasma glucose ≥ 11.1 mmol/L (200 mg/dL), or HbA1c ≥ 6.5%, or known diabetes.

** Cholesterol values are to be entered in the chart as mmol/L. To convert cholesterol mg/dL to mmol/L, multiply by 0.02586. Example: TC = 200 mg/dL x 0.02586 = 5.172 mmol/L.
RISK LEVEL:

- > 20%
- 10–20%
- 5–10%
- < 5%

Counsel

- Counsel on diet (which includes lipid-lowering diet), physical activity, smoking cessation and avoiding harmful use of alcohol

Treat

- Antihypertensive drugs (CCB, Thiazide, ACEI, or ARB)
  - Consider drug treatment if persistent BP ≥ 130/80 mmHg
  - Consider if persistent BP ≥ 140/90 mmHg
  - Consider if persistent BP ≥ 140/90 mmHg (consistent with national policy)

- Lipid-lowering drugs (Statins)
  - Give a statin
Diagnosis and Management of Type 2 Diabetes
Guidelines on second-and third-line medicines and type of insulin for the control of blood glucose levels in non-pregnant adults with diabetes mellitus

Report of a World Health Organization Consultation

Use of glycated haemoglobin (HbA1c) in the diagnosis of diabetes mellitus

Implementation tools

Package of Essential Noncommunicable (PEN) disease interventions for primary health care in low-resource settings
Controlling blood glucose levels

- Metformin
- Sulfonylurea
- Human insulin

- Self-monitoring of blood glucose for people on insulin
Fig. 1 Protocol for control of blood glucose in type 2 diabetes

TEST ADULTS who have symptoms of diabetes with fasting or random plasma glucose (FPG or RPG)
TEST ASYMPTOMATIC ADULTS who are 40+ years old and BMI ≥25 (FPG)

FPG ≥7 mmol/L and <18 mmol/L or RPG ≥11.1 mmol/L
IF ASYMPTOMATIC repeat test on subsequent day
Counsel on diet and physical activity and adherence to medicines at all visits

REVIEW IN 1 MONTH (or immediately if symptoms appear)

IF goal not achieved BEGIN METFORMIN 500 mg daily
REVIEW IN 3 MONTHS (or immediately if symptoms appear)
IF goal not achieved INCREASE METFORMIN to 1000 mg 1 x daily
REVIEW IN 3 MONTHS (or immediately if symptoms appear)
IF goal not achieved ADD gliclazide 80 mg 1 x daily
REVIEW IN 3 MONTHS (or immediately if symptoms appear)
IF goal not achieved despite adherence to medication and diet and physical activity, REFER to higher level of care or BEGIN INSULIN (see insulin protocol)

FPG ≥15 mmol/L and SYMPTOMATIC or FPG/RPG >18 mmol/L, regardless of symptoms

TEST urine ketones

Urine ketones ≥2+
GIVE METFORMIN 1000 mg 2 x daily and GLICLAZIDE 80 g 2 x daily
Counsel on diet, physical activity and adherence to medication
REVIEW in 3–5 days
No improvement
Improvement
REFER to higher level of care
CONTINUE treatment

IF goal achieved or frequent hypoglycaemia, consider reducing or stopping gliclazide in people who were on 2000 mg metformin and 160 mg gliclazide from diagnosis
REVIEW IN 1 MONTH
IF goal NOT achieved
REFER to higher level of care
START with 10 units intermediate-acting insulin (NPH) at bedtime

Continue metformin and sulfonylurea
Counsel patient on hypoglycaemia
Counsel patient on symptoms of hyperglycaemia

REVIEW in 3 days

IF FBG > 7 mmol/L
INCREASE INSULIN dosage by 1–2 units

REVIEW in 3 days

CONTINUE INCREASING DOSAGE by 1–2 units at 3-day intervals until FBG = 4–7 mmol/L
Do not increase insulin if nocturnal hypoglycaemia occurs

IF FBG < 4 mmol/L or if nocturnal hypoglycaemia occurs
REDUCE INSULIN by 1–2 units

IF FBG 4–7 mmol/L and daytime hypoglycaemia occurs REDUCE morning gliclazide by 40 mg
STOP morning gliclazide if daytime hypoglycaemia continues

IF FBG > 7 mmol/L AND nocturnal hypoglycaemia occurs, REFER to higher level of care

IF stabilized REVIEW with HbA1c in 3 months

IF HbA1c > 7.5%
REFER to higher level of care for intensification
Targets for glycaemic control

- The majority of patients can be expected to aim for an HbA1c of 7.0% (53 mmol/mol).
- The HbA1c target can be relaxed (e.g. to <8% or <64 mmol/mol) in people with frequent severe hypoglycaemia, advanced complications or low life-expectancy.
- Patients treated with diet, physical activity and metformin (very low risk of hypoglycaemia) should be encouraged to achieve a lower HbA1c target.
- If HbA1c measurement is not available or there is concern over its validity, an FPG value of ≤7.0 mmol/L (126mg/dL) and a postprandial PG value of ≤9.0 mmol/L (160 mg/dL) can serve as surrogates.
Management of CVD risk factors in diabetes

Blood pressure control

• **Thiazide diuretics** and **angiotensin-converting enzyme (ACE) inhibitors** (or other HEARTS protocol – CCB, ARB)

• Target blood pressure < 130/80 mmHg

Lipid control

• **Statins** for people >= 40 yrs

Antiplatelet treatment

• 75-100 mg of acetylsalicylic acid daily for survivors of a CVD event who have no history of major bleeding
SCREENING FOR CHRONIC COMPLICATIONS

- Measure **blood pressure** at every scheduled visit, review medication as per hypertension protocol
- REFER for **dilated-pupil retinal exam** upon diagnosis, and every two years thereafter, or as per ophthalmologist recommendation
- Examine **feet** for ulcers at every visit. REFER to higher level of care if ulcer present
- **Assess risk of lower limb amputation** annually (foot pulses, sensory neuropathy by monofilament, presence of healed or open ulcers, calluses). REFER to higher level of care if ulcer present or pulse absent
- Test for **proteinuria** annually. REFER to higher level of care if positive.
Planned new guidance

- Insulin use in type 1 diabetes in low-resource settings (2021)
- Diagnostic criteria and treatment of hypertension (2021)
- Update of medicines for type 2 diabetes (2021)
- Hyperglycaemia in pregnancy: update of diagnostic criteria, guidelines for screening and management (2022-2023)
- Management of diabetes in humanitarian settings (2022-2023)
Thank you