Cardiovascular disease, Type 2 diabetes and hypertension in adults

CASE MANAGEMENT DESK GUIDE

Evidence document

This document contains the evidence (seen on opposing pages) which supports the recommendations for interventions in this generic desk guide for the management of cardiovascular disease and associated conditions in adults, according to the GRADE scheme by WHO. Evidence, references and recommendations will not appear in the version for use by clinicians. Recommendations and actions in blue will be adapted by the country working group.

In making our recommendations we have considered both the disease and the context.

The following criteria has been used:

- Balance between desirable and undesirable effects
- Quality of evidence
- Values and preferences
- Cost (resource allocation)

(Guyatt *et al.* 2008)

Strength of recommendation	Rationale
Strong	The panel is confident that the desirable effects of adherence to the recommendation outweigh the undesirable effects.
Conditional	The panel concludes that the desirable effects of adherence to a recommendation probably outweigh the undesirable effects. However: • the recommendation is only applicable to a specific group, population or setting OR • new evidence may result in changing the balance of risk to benefit OR • the benefits may not warrant the cost or resource requirements in all settings.

(WHO 2010a)

Evidence level	Rationale
High	Further research is very unlikely to change confidence in the estimate of effect.
Moderate	Further research is likely to have an important impact on confidence in the effect.
Low	Further research is very likely to have an estimate of effect and is likely to change the estimate.
Very low	Any estimate of effect is very uncertain.

(WHO 2010a)

Limitations of evidence review:

The recommendations made in the generic desk guide are based on available literature and current guidelines. Whilst every attempt has been made to perform a thorough literature search to identify appropriate and relevant evidence, it is not a fully systematic literature review, therefore it cannot be guaranteed that all available evidence has been considered. However, the recommendations also incorporate internationally approved evidence-based guidelines. These have used equivalent evidence scoring systems, thus it can be assumed that the grading of the recommendations made here is valid.

Introduction

This is a generic desk guide for the management of cardiovascular disease, diabetes and hypertension in adults in low-middle income countries.

These guidelines and related tools must be adapted to the local health service context in country by the Ministry of Health and NGO partners through a working group process. This process should acknowledge available resources, including; staff, drugs, basic equipment, tests (and units) prior to pilot, evaluation and scale-up in country.

This desk guide is a concise "quick reference" for doctors, clinical officers, paramedics, nurses and counsellors to use when providing routine care and health education to all patients. The initial assessment pages are designed for use with any adult who presents at a primary care facility e.g. health centre or district hospital outpatient department. The objective is to enable effective opportunistic screening, diagnosis and treatment of patients with chronic noncommunicable diseases, in particular, cardiovascular disease, type 2 diabetes mellitus, hypertension and underlying risk factors. The desk guide clearly indicates when other guidelines should be used, i.e. when the management of disease, such as acute illness, is not within the scope of this guide.

It provides a systematic approach to the monitoring of patients with these diseases and the prevention and identification of complications. It clearly indicates when referral to district hospital and assessment by a more senior clinician is appropriate, in conjunction with continuing routine care at the nearest health unit. It will help to educate patients about lifestyle measures and specific treatments so individuals can take responsibility for their own care. This document only includes brief lifestyle education messages and will be accompanied by a more detailed guide on lifestyle advice and treatment support, for use by the health educator/clinician.

This desk guide incorporates recommendations from WHO "Package of Essential Noncommunicable Disease Interventions (PEN) for Primary Health Care" (2010b) and IDF Global Guidelines for Type 2 Diabetes (2005) and has been produced by thorough review of current guidelines and relevant published literature.

Contents

ASSESSMENT OF CARDIOVASCULAR DISEASE (CVD), HYPERTENSION AND TYPE 2 DIABETES

ASK THE PATIENT
- current symptoms
- related symptoms
- previous symptoms/treatment
- current medication

Refer to hospital urgently if the patient has current and/or severe symptoms of CVD:
- chest pain more than half hour at rest (MI)
- chest pain for few minutes on exercise, going away at rest (angina)
- shortness of breath and ankle swelling (heart failure)
- sudden one sided weakness/slurred speech/visual loss (stroke/TIA)
- pain in the back of lower legs or buttocks on walking, relieved with rest (peripheral vascular disease)

If previous symptoms of CVD **refer for non urgent review.**

Test for HIV and diabetes (see p20) if patient has any of:
- thirst
- frequency of urine
- feeling weak, tired all the time
- recurrent infections; vaginal/underarm thrush, skin boils
- vision loss
- "pins and needles" in the feet

If patient has symptoms other than in above groups e.g. cough, fever, diarrhoea:

<2 weeks Consult IMAI

>2 weeks or recurrent Consult xxx and consider test for HIV/TB

EXAMINE THE PATIENT
Look for signs related to symptoms and assess for severe illness

If >50yrs take BP (see p12) unless normal BP recorded in last year. If >140/90mmHg repeat and consider diagnosis of hypertension (see p12)

If >50yrs measure waist circumference. If >102cm(M) >88cm(W), test blood glucose. (see p20)

If >50yrs and family history of diabetes, test blood glucose. (see p20)

Urgently treat and **refer to hospital** if signs of severe illness:
- respiratory rate >20/min or pulse >100bpm
- shock e.g. BP <90mmHg systolic
- very high BP >200mmHg systolic or >120mmHg diastolic
- fever >39°C, abdominal pain and guarding, chest pain, shortness of breath

MANAGE THE PATIENT
Treat current condition

If overweight, advise physical activity/healthy eating (see p9)
If smoker, advise to stop smoking (see p9)

If CVD (see p), diabetes (see p20), hypertension (see p12).
- Register and treatment card
- Disease specific education
- Lifestyle advice
- Medication and treatment support
- Follow up appointment

Chronic care for cardiovascular disease

Health educator

Assessment and tests

Complications and referral

Register and treatment card

Disease specific education

Lifestyle advice

Medication and patient adherence

Treatment contract*

Follow-up appointment

Concerns and questions
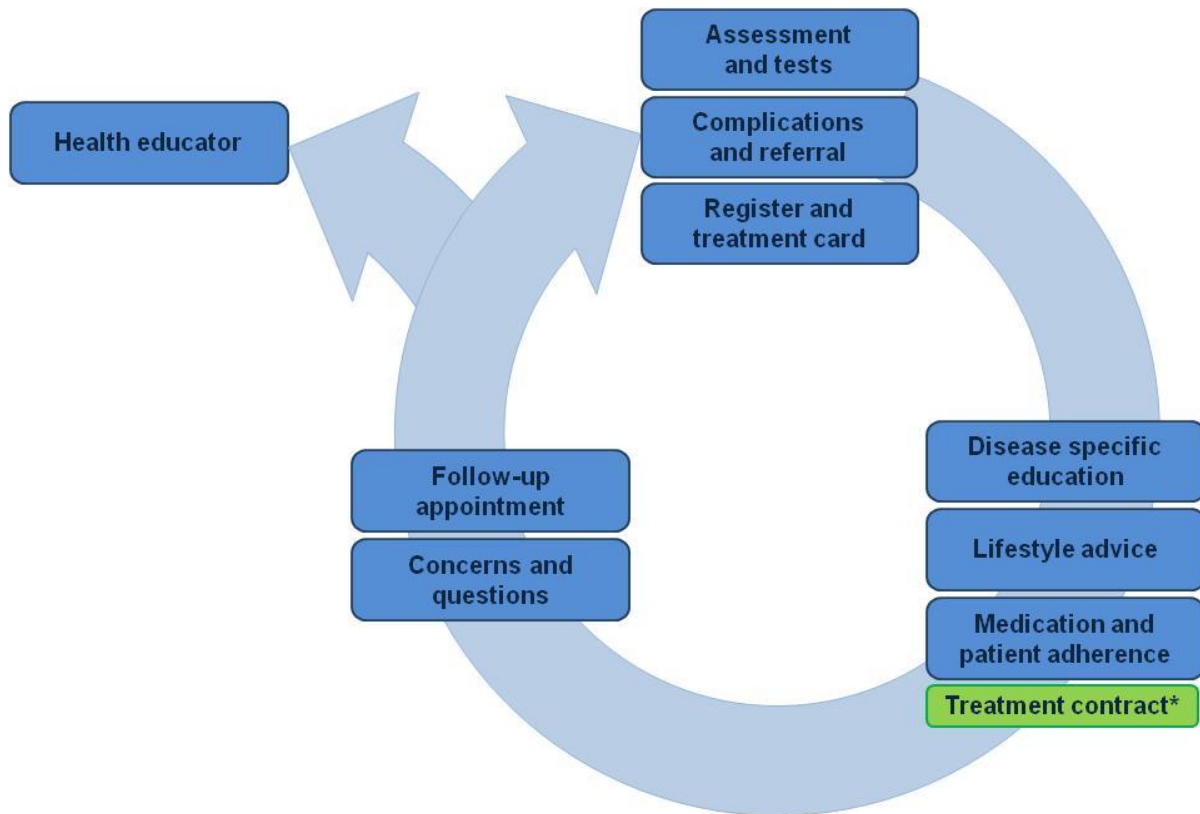
*for initial appointment only

Lifestyle advice

Discuss the following with each patient then refer to health educator (with patient treatment card) for lifestyle counselling if they have CVD, hypertension or diabetes.

Give all patients a lifestyle education leaflet.

Weight:
Advise all overweight patients to lose weight by increasing physical activity and healthy eating (WHO 2007).

Healthy eating:
Encourage individuals to eat less fat and salt and to increase their intake of fruit and vegetables.

Physical Activity:
Encourage existing activity and advise 30 mins/day of physical activity that makes them out of breath (WHO 2007).

Alcohol:
Advise individuals to drink less than 3 units each day (1.5 pints of beer, 1 large glass of wine, 75ml of spirits) (WHO 2007).

Smoking (if applicable):
Encourage all patients who smoke to give up smoking.
Encourage all non-smokers not to start smoking.

It is recommended that all individuals who are overweight should be encouraged to lose weight through increased physical activity and dietary advice. *(Strong recommendation, high quality of evidence)*
This recommendation is based on guidance from WHO (2007) and is supported by a large body of evidence; meta-analyses of RCTs demonstrating the effect of weight reducing diet and exercise on weight loss and observational studies. The benefits of adhering to this recommendation are very likely to outweigh the risks, thus this has been graded 'strong'.

It is recommended that where caffeine intake is excessive, it should be reduced *(based on current guidelines).*
This recommendation is as per current NICE guidelines (2011). It was not feasible or worthwhile to revisit the evidence and therefore it has not been possible to produce a GRADE profile.

It is recommended that all individuals should reduce total daily fat and saturated fat, eliminating trans fatty acids and where possible, dietary fat should be poly/monounsaturated. *(Strong recommendation, high quality of evidence)*
This recommendation is based on WHO guidelines for the prevention of cardiovascular disease (2007). The evidence of the relationship between dietary fat intake and cardiovascular diseases has been widely described. As reflected in the recommendation, guidance differs depending on the type of fat. It is important that these differences are recognised and adhered to in combination.

It is recommended that all individuals should reduce their salt intake, where possible to <5g/day. *(Strong recommendation, high quality of evidence)*
This recommendation stems from WHO (2007) guidance and corresponding discussion of evidence in addition to NICE (2011) guidelines. In implementing this recommendation in country adaptation is advised.

It is recommended that all individuals should eat at least 400g a day of fruit and vegetables, which equivalent to 5 portions. *(Strong recommendation, moderate quality of evidence)*
This recommendation is supported by national guidance in the UK and internationally by WHO (2007). Although the evidence is not definitive as to the extent to which this is beneficial, the desirable effects of adhering to this recommendation are very likely to outweigh the undesirable effects and thus has been graded 'strong'.

It is recommended that all individuals are strongly encouraged to take at least 30 minutes of moderate physical activity per day. *(Strong recommendation, high quality of evidence)*
This recommendation is based on conclusions made in the 'Prevention of Cardiovascular Risk' guidelines by WHO (2007). The WHO cites several reviews that support the effectiveness of interventions to promote physical activity to prevent cardiovascular disease. Whilst increased physical activity has been shown to be effective, interventions in low resource settings are less well described. During the adaptation process for the desk guide, context specific examples for activities must be incorporated to ensure it remains cost-effective and appropriate.

It is recommended that all individuals who drink more than 3 units of alcohol per day should be advised to reduce consumption. *(Conditional recommendation, moderate quality of evidence)*
This recommendation is based on guidance produced by WHO (2007). Whilst there is limited evidence that a certain level of alcohol intake may be beneficial in preventing cardiovascular disease, the overall recommendation is to reduce intake. This recommendation is therefore likely to be altered by the presence of further research

It is recommended that all non-smokers should be encouraged not to start smoking *(based on current guidelines).*
This recommendation is as per WHO guidance (2007). Given the high quality of evidence supporting smoking cessation, this recommendation is well-founded. However, it was not possible to produce a GRADE profile as it is not directly and explicitly supported by evidence. In addition, it was not feasible or necessary to revisit the evidence. WHO (2007) note that there is some research providing evidence of the detrimental effects caused by even "very low consumption".

It is recommended that all smokers should be strongly recommended to quit smoking by a health professional and supported to do so *(Strong recommendation, high quality of evidence)*
This recommendation is based on the discussion of evidence and subsequent guidance as presented by WHO (2007). It is clear from the evidence that the benefits of smoking cessation undoubtedly outweigh the risks. Furthermore, further research is unlikely to change confidence in the estimate of effect. The most effective methods to support individuals are less well defined.

It is recommended that those who use other forms of tobacco are encouraged to stop *(Strong recommendation, moderate quality of evidence).*
This recommendation arises from the discussion of evidence by WHO (2007). It is graded 'conditional' as the desirable effects of adherence to this recommendation are likely to outweigh the undesirable effects, however, this is supported by less evidence than for tobacco consumption through cigarette smoking. Further evidence is therefore likely to have an important impact on the extent to which this recommendation is beneficial.

Cardiovascular disease

At **first appointment**:
If current/previous CVD, ensure urgent or routine **referral to hospital**
Give all patients lifestyle advice (see p)
Make a follow up appointment.

At **next appointment**:
Follow care plan from hospital
Make sure patient on aspirin and statin
Make sure patient sees health educator
Refer to appropriate disease guideline:

LMIC specific guidance:
- WHO Prevention of recurrent heart attacks and strokes in LMIC populations. Evidence-based recommendations for policy makers and health professionals. http://www.who.int/cardiovascular_diseases/resources/pub0402/en/
- Rheumatic fever and rheumatic heart disease: Report of a WHO expert consultation. www.whqlibdoc.who.int/trs/WHO_TRS_923.pdf

General guidance:
- Scottish Intercollegiate Guidelines Network http://www.sign.ac.uk/guidelines/fulltext/93-97/index.html
- European Society of Cardiology http://www.escardio.org/guidelines-surveys/esc-guidelines/Pages/GuidelinesList.aspx
- Centre for Disease Control and Prevention http://www.cdc.gov/heartdisease/guidelines_recommendations.htm
- NICE National Institute for Health and Clinical Excellence http://www.nice.org.uk/guidance/index.jsp?action=byTopic&o=7195

Continue to follow up 1-6 monthly as needed.

Hypertension

Diagnose hypertension

Measure BP after sitting for 5 mins

If BP >140/90mmHg take second measurement during consultation
Repeat measurement at 3 consultations.

If lowest BP is >140/90mmHg, diagnose hypertension.

(NICE 2011; WHO 2010b)

If not hypertensive, review in 5 years (NICE 2011)

Manage hypertension

Advise lifestyle changes for **all patients** with hypertension (see p9)
(WHO 2007)

Follow up all patients 1x month until BP target reached, more frequently if severe or have complications. Once BP stable, follow up 3-6 monthly.   (Chobanian et al. 2003)

For patients with;
Stage 1 hypertension (>140/90mmHg) with**;**
- No additional complications and no improvement with lifestyle alone, consider anti-hypertensives (see p15).
- Target organ damage, CVD, renal disease or diabetes, begin anti-hypertensives immediately (see p15) (NICE 2011).

Stage 2 hypertension (>160/100mmHg);
- Start anti-hypertensives immediately (see p15) (NICE 2011).

Severe hypertension (>180mmHg systolic OR >110 mmHg diastolic);
- Start anti-hypertensives immediately (see p15) (NICE 2011).
- **Refer to hospital** (NICE 2011; WHO 2007)

Type 2 diabetes and **hypertension;** (NICE 2009)
- Diagnose and treat if BP >130/80mmHg on 3 occasions (see p16)
- Repeat BP every:
    - 1 month if >150/90mmHg
    - 2 month if >140/80mmHg (or 130/80mmHg if renal/eye/cerebrovascular damage)
    (NICE 2009; IDF 2005)

Refer any patient with:

- chest pain and breathlessness (angina, heart attack or heart failure)
- slurred speech, one-sided weakness (stroke/transient ischaemic attack)
- pain in the calf when walking (peripheral vascular disease)
- vision loss (retinopathy, cataract)
- pins and needles/numbness in hands and feet (neuropathy).
- urine dipstix +ve (kidney disease)
    - microscopic haematuria or casts
    - proteinuria on 2 or more occasions
- creatinine >1.8mg/dL (160umoles/L) or rise if more than 10% from previous level or low or falling eGFR <60mls/min/1.73m^2

It is recommended that systolic blood pressure is lowered to 140mmHg or less. *(Conditional recommendation, moderate quality of evidence)*
This recommendation stems from the discussion of evidence in the 'Prevention of Cardiovascular Risk' guidelines produced by WHO (2007). One trial suggests that BP of 139/83mmHg gives maximal cardiovascular benefit, whilst other evidence more generally supports a decrease in BP. This recommendation is 'conditional' as it does not apply to certain groups with additional comorbidities.

It is recommended that all individuals who have hypertension with BP >160/100 are given anti-hypertensives immediately. *(Strong recommendation, high quality of evidence)*
This recommendation is supported by the 'Prevention of Cardiovascular Risk' guidelines produced by WHO (2007). It is noted that anti-hypertensive treatment has been found to be beneficial in all clinical trials for individuals with BP >160/100mmHg.

It is recommended that individuals who have hypertension with BP >180/110 are immediately referred to hospital. *(based on current guidelines)*
This recommendation is as per current NICE guidelines (2011). Given this has been recently updated, no further review of evidence has been completed, therefore a GRADE profile has not been produced.

It is recommended that individuals with BP >140/90 mmHg and target organ damage, CV, renal disease or diabetes begin anti-hypertensives immediately. *(based on current guidelines)*
This recommendation is as per current NICE guidelines (2011). Given this has been recently updated, no further review of evidence has been completed, therefore a GRADE profile has not been produced.

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It is recommended that all individuals with hypertension are encouraged in physical activity, healthy eating and if appropriate, smoking cessation and reducing alcohol intake. *(Strong recommendation, high quality of evidence)*
This recommendation is as recommended by NICE (2011) and WHO (2007). Evidence for each of these interventions has been reviewed, discussed and assigned a GRADE profile in their respective sections. Collectively, one can be confident that the desirable effects of adherence to these interventions outweigh the undesirable effects. The recommendation is applicable and warrants the resource requirements to all populations and settings. Furthermore, new evidence is very unlikely to change the balance of risk to benefit.

It is recommended that in patients with diabetes or established renal or vascular disease, blood pressure should be reduced to at least 130/80 mmHg. *(Strong recommendation, moderate quality of evidence)*
This recommendation is based on discussion of evidence by WHO (2007) and NICE guidelines (2009). There is substantial evidence suggesting that reduction of BP to a target of 130/80mmHg in this specific group of individuals is likely to provide additional benefit, however, the extent to which this is beneficial is not quantified. Although only applicable to a specific group of individuals, this is not graded as 'conditional' as the recommendation is clearly targeted to this population.

Anti-hypertensive drugs

- If possible, offer drugs taken only once per day.
- Start with lowest dose and increase doses in stepwise manner to maximum tolerated dose to achieve control (NICE 2011).
- Monitor potential side effects.

Hypertension without diabetes:

(NICE 2011)

Starting anti-hypertensives:

Step 1
If pregnant or planning pregnancy, **refer to hospital**.

If <55yrs: ACEi or ARB (Do not combine ACEi with ARB) (see p37)
if ACEi not available, start with CCB.

If >55yrs or African/Caribbean: CCB or thiazide if contraindications

Step 2
If BP still >140/90mmHg increase dose or add second stage drug (see p37)
<55yrs: add CCB
>55yrs: add ACEi

Step 3
If BP still >140/90mmHg increase dose or add third drug. (see p37)
All ages: Thiazide diuretic

Refer to hospital if any of:
BP still >140/90mmHg despite 3 drugs and lifestyle advice
Pregnant (consider methyldopa, CCB, diuretics) (see p37)
Proteinuria with eGFR <60/min/1.73m^2

Follow up all patients 1x month until BP target reached, more frequently if severe or have complications. Once BP stable, follow up 3-6 monthly.   (Chobanian et al. 2003)

Hypertension with diabetes:

Aim to maintain BP <130/80mmHg if eye, kidney or CVD
Maintain <140/80mmHg in others (NICE 2009; IDF 2005)

Starting anti-hypertensives:

Step 1
ACEi or if African Caribbean either (ACEi and diuretic) or CCB (see p37)

Step 2
If BP still above target, increase dose or add CCB or diuretic (see p37)

Step 3
If BP still above target, increase dose or add diuretic or CCB (see p37)

If reaches target – monitor every 4-6 months (NICE 2009; IDF 2005)

Refer to hospital if:
BP still above target despite 3 drugs and lifestyle advice.
Pregnant (consider methyldopa, CCB, diuretics) (see p37)
Proteinuria with eGFR <60/min/1.73m^2

It is recommended that drugs that only need to be taken once a day should be offered where possible. *(Strong recommendation, moderate quality of evidence)*
This recommendation is based on two Cochrane reviews examining adherence to medication and adherence strategies for patients with Type 2 diabetes mellitus (Haynes et al. 2008; Vermeire et al. 2005). In both of these, it was found that simplifying dosing strategies showed some effectiveness in improving adherence. However, further research is likely to impact on the extent to which adherence is improved. Once daily dosing is also suggested by WHO (2007). NICE (2011) refer to previous clinical guidelines, which suggest that this is one of a number of interventions that should be considered to improve adherence, although evidence is inconclusive.

It is recommended that an ACE inhibitor (ACEi), calcium channel blocker (CCB) or low-dose diuretic should be used as first line treatment for hypertension. *(Conditional recommendation, high quality of evidence)*
This recommendation is based on discussion of evidence by WHO (2007) and current NICE guidelines (2011; 2009). RCTs testing CCBs and diuretics have provided evidence that their use leads to reductions in death and illness due to CVD. Comparison of ACEi with other drug classes demonstrated similar improvements in CV mortality. However, this recommendation is only 'conditional' as the use of these drugs in specific populations/groups is contraindicated.

It is recommended that if a second anti-hypertensive drug is added, it is of a different class of drug. *(based on current guidelines)*
This recommendation is as per WHO guidelines (2007) and is widely adopted by national guidance (NICE 2011).

Hypertension patient education

Reinforce messages at all appointments.
Add additional information as required e.g. change in medication.
Use local, simple and clear language.
Give the patient an education leaflet.
Ask patient to repeat key points and ask if they have any questions.
Refer to health educator.

Inform patient:
- Hypertension is a long term condition that can be treated with lifestyle changes and medication.
- A person cannot give hypertension to another person.
- A healthy diet, increased physical activity, no smoking, less alcohol are essential.
- If hypertension is not treated, it can cause stroke, heart attack, vision problems, disease of your blood vessels, kidney failure and death.
- Diabetes and hypertension are linked diseases.
- Patients with diabetes can develop hypertension and the other way round, especially if overweight.

Remind patient:
- Name, colour, dosage and number of each tablet.
- To take tablets as prescribed, at the same time each day
- Not to take someone else's tablets.
- If they forget to take a tablet, not to take an extra dose next time.
- Only change tablets when the health worker advises them.
- Of side effects (see p39) and to tell the health worker if they experience any.

It is recommended that all individuals with hypertension should receive education. *(based on current guidelines)*
This recommendation is as per NICE guidelines (2011), however only focuses on adherence and side effects of drugs.

Type 2 Diabetes

Diagnose Type 2 diabetes

Check random blood glucose (RBG).
If blood glucose not available, test urine glucose.

If RBG >11mmol/L (>200mg/dl) and symptoms (see p6) diagnose diabetes
If RBG <11mmol/l (<200mg/dl) and >6.1mmol/L (>110mg/dl) (with or without symptoms) then repeat with a FBG next morning. (IDF 2005)
If FBG >7.0mmol/l (>126mg/dl) diagnose diabetes. (WHO/IDF 2006)
If FBG not possible, repeat RBG, if >11mmol/l (>200mg/dl) diagnose diabetes

(NICE 2009; WHO/IDF 2006; IDF 2005)

If 2 BG in-between normal and diabetes values (RBG 7.8-11mmol/l (140mg/dl-200mg/dl) or FBG 6-7mmol/l (110mg/dl-125mg/dl)), diagnose pre-diabetes or use OGTT to confirm impaired glucose intolerance (WHO/IDF 2006)
If BG >11mmol/l (>200mg/dl) 2 hour post OGTT diagnose diabetes

- Inform patient they may develop diabetes in future
- Advise lifestyle changes (see p9)
- Check blood glucose every year (or at 6 months if they have CVD)
- If pregnant **refer to hospital**

(WHO/IDF 2006)

Summary:

 If 2 BG normal (RBG<7.8mmol/(<140mg/dl),
FBG<6mmol/L(<110mg/dl))with symptoms, consider different diagnosis (see p6)

If 2 BG normal (RBG<7.8mmol/L (<140mg/dl), FBG<6mmol/L (<110mg/dl)) and no symptoms then give lifestyle advice (see p9) do not follow up patient.

It is recommended that diabetes is not diagnosed on the basis of one measurement in the absence of symptoms. *(based on current guidelines)*
This recommendation is as per IDF guidelines (2005).

It is recommended that the following criteria be used for diagnosis of diabetes; FBG >7mmol/l or RBG >11mmol/l. *(Strong recommendation, moderate quality of evidence)*
This recommendation is based on WHO guidance (2006). Although it is acknowledged that there are "limitations with the data from which the diagnostic criteria are derived….the criteria distinguish a group with significantly increased premature mortality and increased risk of microvascular and cardiovascular complications" (WHO/IDF 2006). It is therefore likely that new evidence is likely to have an important impact on confidence of the effect (WHO 2010a) and has therefore been graded 'moderate'.

Manage diabetes

At every appointment, for all patients with diabetes:
- Test BG
- Perform HbA_{1c} at diagnosis and 2-6 monthly (IDF 2005)
- Advise lifestyle changes (see p9)
- Advise glucose test before breakfast and 2 hours after a meal once per week, or more often if poor control or if on insulin.
- Check BP (see p12)
- Check blood lipids/K/creatinine/eGFR
- Urine dipstix

If complications or RBG is >15mmol/l or FBG >11mmol/l start drugs (see p27)

At 1 month: Decide target level for blood glucose reduction
(if end organ CVD less aggressive target)
(Skyler *et al.* 2009)

Start drugs if: RBG >11mmol/l or FBG >7.0mmol/l or HbA_{1C} >7%
If already on drugs increase dose.

At 2 months:
If BG not at target level, increase dose and follow up monthly.
If BG at target level, follow up in 3-6 months.

At 1 year in addition to the list above:
- Ask about change to vision/vision loss; use vision chart, look for cataract, examine retina.
- Assess the condition of the feet; check sensations, foot pulses and footwear.
- Ask about pins and needles, numbness in legs and poor erections; check for peripheral sensation loss.
- Discuss knowledge and beliefs of diabetes, foot care, glucose monitoring.
- Discuss progress with lifestyle changes.
- Ask type of contraception and whether planning pregnancy.
(IDF 2005)

Refer to hospital any patient with:
- pregnancy
- altered consciousness with too low/high glucose (<4mmol/l or >20mmol/l)
- BP >220/120mmHg (or >130/80mmHg despite maximum treatment)
- chest pain and breathlessness (angina, heart attack or heart failure)
- slurred speech, one-sided weakness (stroke/transient ischaemic attack)
- pain in the calf when walking (peripheral vascular disease)
- severe leg ulcers and/or infection
- vision loss (retinopathy, cataract)
- pins and needles/numbness in hands and feet (neuropathy).
- urine dipstix +ve
    - microscopic haematuria (once infection excluded) or casts
    - proteinuria on 2 or more occasions
    - ketones ++
- creatinine >1.8mg/dL (160umoles/L) or rise if more than 10% from previous level or low or falling eGFR < 60mls/min/1.73m^2 (kidney disease) and stop metformin

It is recommended that for individuals with diabetes, who do not have any complications or established atherosclerosis, intensive glycaemic control is likely to be beneficial. *(Strong recommendation, moderate quality of evidence)*

It is recommended that for individuals with more advanced diabetes, who have complications, are older or have advanced atherosclerosis a less aggressive target for glycaemic control should be set. *(Conditional recommendation, low quality of evidence)*

Both recommendations are based on a review of evidence collated by the American Diabetes Association informing their position statement (Skyler et al. 2009). There is a substantial body of evidence supporting the use of intensive glycaemic control for patients with uncomplicated diabetes. However, the extent of this effect may be influenced by further evidence. For individuals with advanced diabetes, current evidence suggests potential risks may outweigh the benefits of an intensive regimen. In this subgroup, a less aggressive target is recommended, but it is acknowledged that future research may change the balance of risk to benefit and the confidence of effect.

Oral hypoglycaemic drugs

- Start with lowest dose and increase in stepwise manner to achieve control (IDF 2005). Consider using two drugs from different drug classes in combination before reaching maximal doses of individual drugs (Del Prato *et al.* 2005).
- Monitor potential side effects (see p39).

Step 1: Biguanide (not if contraindicated (see p38), pregnancy or serious illness)   (WHO 2009)

Metformin (500mg) OD for 2 weeks (max 2g daily in divided doses). If tolerated increase to twice daily for another 2 weeks.

(WHO 2009)

If BG not controlled, add step 2 drug.

Step 2: Sulphonylurea

Add one of:
Glibenclamide 2.5-5mg daily (max 15mg) (WHO 2009)
Gliclazide 40-80mg daily (max 320mg daily in divided dose)
Glimperide 1mg daily (max 6mg)
Glipizide 2.5-5mg daily (max 15mg)
Tolbutamide 0.5g daily (max 2g)

(Joint Formulary Committee 2011)

For patients who do not tolerate Step 1 or 2 drugs, use Acarbose (NICE 2009) 50mg daily (max 200mg TDS).

(Joint Formulary Committee 2011)

If BG not controlled, consider insulin and **refer to hospital**.

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It is recommended that drug doses are increased in a stepwise manner until blood glucose control is achieved. *(based on current guidelines)*
This recommendation is based on NICE (2009) and IDF guidance (2005) particularly relating to the introduction of metformin, to minimise discontinuation due to gastrointestinal side effects.

It is recommended that addition of a different class of drug is considered before the maximal dose of the initial drug is reached. (*Conditional recommendation, moderate quality of evidence)*
Several studies (Bailey et al. 2009; Bailey et al. 2005; Del Prato et al. 2005) reviewed by the American Diabetes Association (ADA) advocate the use of more intensive blood glucose control, including addition of a second drug from a different class prior to reaching the maximum dose of the first drug. Whilst the recommendation for intensive blood glucose control should be considered in relation to each individual patient, the recommendation to introduce combination therapy at an earlier stage in the titration should apply to all. This recommendation is graded as 'conditional, moderate', because as the body of evidence continues to grow it may affect the confidence to which this statement is endorsed.

It is recommended that metformin is used as a first line therapy to control blood glucose levels, except in pregnancy or if individual has renal impairment. *(Conditional recommendation, high quality of evidence)*
This recommendation is based on both international and national guidelines (NICE 2009; IDF 2005). Evidence to support the use in all groups, except those with contraindications, is widely accepted. Potential side effects are also well described and in recommending this management it is acknowledged that these need to be taken into consideration at an individual level. Therefore, this recommendation is 'conditional' as appropriate monitoring is required to ensure the safety of this intervention.

It is recommended that a sulphonylurea should be added to control blood glucose if metformin is insufficient or used as first line therapy if metformin is not tolerated and individual is not overweight. *(Conditional recommendation, high quality of evidence)*
This recommendation is based on both international and national guidelines (NICE 2009; IDF 2005). It is acknowledged that no other class of drug surpasses the benefit of sulphonylureas at a population level. This recommendation is graded 'conditional' as side effects may influence adherence reducing the effectiveness of the intervention.

It is recommended that oral hypoglycaemic drugs are administered when lifestyle interventions alone are unable to control blood glucose. *(based on current guidelines)*
This recommendation is based on IDF guidelines (IDF 2005).

Insulin

Continue Metformin and stop sulphonylurea when starting insulin.

Monitor weekly, then monthly. 3 monthly when controlled.

Consider:
Is patient/treatment supporter willing and capable to start insulin?
- good vision, use of hands to use appropriate device.

Can insulin be stored at home? (Cool dry place/fridge away from heat sources)

Is glucose monitoring at clinic or home available?
- If no, give long acting insulin once a day.
- If yes, give in the following order until BG controlled:
    - long acting OD
    - mix of short/intermediate acting BD
    - short acting TDS
    - short acting TDS and long acting OD

(WHO 2009; IDF 2005)

Insulin dosage and frequency depends on many factors:
- Ask about their job, meal and sleep times, weekend activities etc.
  If regular meals and activity give insulin BD.
  If not, insulin TDS or even QDS may be needed.
- Weight – heavier people need more.
- Duration/phase of diabetes – more insulin if advanced diabetes
- State of injection sites – subcutaneous injection into stomach or thighs, not the arms, lower dose needed if sites are lump free.
  Rotate injection sites to reduce insulin injection site damage.
- Increased physical activity lowers requirement.
- Other infections/illnesses increase requirement.
- Other treatments (beta blockers etc.)

Diabetes patient education

Reinforce messages at all appointments.
Add additional information as required e.g. change in medication.
Use local, simple and clear language.
Give the patient an education leaflet.
Ask patient to repeat key points and ask if they have any questions.
Refer to health educator.

Inform patient:
- Diabetes is when the body cannot properly use the foods we eat, especially sugar due to lack of insulin.
- Treatment is life-long.
- A person cannot give diabetes to another person.
- Blood sugar control, a healthy diet and increased physical activity are essential.
- If blood glucose is not controlled, it can cause blindness, kidney failure, heart disease, strokes, disease of your blood vessels, impotence, leg ulcers.
- Diabetes and hypertension are linked diseases.
- Patients with diabetes can develop hypertension and the other way round, especially if overweight.
- High blood sugars in pregnancy can damage unborn baby.

Risk of hypoglycaemia (too low blood sugar) especially if on insulin and sulphonylureas, or if drinking alcohol, if a meal is small, missed or delayed, or if daily activity is increased.

If patient has symptoms:
- shakiness
- fast heartbeat
- hunger
- irritability
- cold sweat
- dizziness
- headache
- pale or moist skin
- confusion
- anxiety
- weakness

If alert: quickly drink a small glass of a sugary drink, or eat a tablespoon of sugar/honey (placed under the tongue) and a snack e.g. bread. If not alert/unconscious: **urgently refer to hospital**.

Remind patient:
- Name, colour, dosage and number of each tablet.
- It is important to take treatment even if you feel well.
- To take tablets as prescribed, at the same time each day
- Not to take someone else's tablets.
- If they forget to take a tablet, not to take an extra dose next time.
- Only change tablets when the health worker advises you.
- Of side effects (see p39) and to tell the health worker if they experience any.
- Examine your feet regularly for broken skin/infections/injury, if present, see health worker (WHO 2011).
- Look after your feet – avoid walking barefoot/without socks, wash feet and dry them well, do not cut calluses/corns (WHO 2011).

If on insulin**:**
- Subcutaneous injection on stomach/thighs, not in arms or by mouth.
- Patients are more likely to get low glucose (hypos) with insulin.
- Patients are more likely to gain weight.
- Patients may get fluid retention.
- It is important to take insulin even if unwell or not eating, the dose may need to be altered.

It is recommended that all individuals with diabetes should receive structured patient education. *(Strong recommendation, moderate quality of evidence)*
This recommendation is based on evidence discussed by IDF (2005) and NICE (2009). Despite the lack of evidence on cost effectiveness, no further research is likely to alter the balance of risk and therefore this recommendation is graded 'strong'. New evidence is however very likely to affect confidence in the estimate of effect.

Patient adherence

- **Explain** to the patient the importance of attending clinic appointments and taking prescribed medication.
- **Discuss and sign** the treatment contract.
- **Explain** the importance of a treatment supporter.
- **Tell** the patient that if they miss an appointment a reminder will be sent or an attempt to contact them will be made.
- **Give** the patient an education leaflet.
- **Refer** the patient to the health educator.

A treatment supporter

Explain to patient why a treatment supporter is important:
- Treatment is life-long, support is essential.
- It can be difficult to remember to take tablets regularly, but it is vital to continue treatment.
- A treatment supporter is someone they can talk to easily and who will encourage them.
- It is their choice who will be their treatment supporter. They will be called if they cannot be contacted or if there is a problem.

Discuss who would be the best treatment supporter; it must be someone concerned, trusted and committed to providing support.

Help the patient choose someone e.g. family member, friend or community volunteer. If patient cannot decide, suggest someone.

Record name, address and mobile phone number of patient and treatment supporter on the patient's treatment card (see p35).

Ask the patient to bring treatment supporter with them for all clinic visits, to learn about the illness, treatment and their role.

Advise treatment supporter to**:**
- Meet with the patient often, try to make this a enjoyable time. If possible, meet at the time the patient takes their tablets to see them taking the tablets as prescribed.
- Look at tablet pack to check the patient is taking tablets correctly.
- Inform health worker if the patient stops taking the tablets.
- Encourage the patient to be active, eat healthily, stop smoking as needed and attend appointments.

(Kunutsor *et al.* 2011; Qureshi *et al.* 2007; Khan *et al.* 2005)

It is recommended that all patients with CVD and associated conditions identify and involve a treatment supporter of their choice. *(Conditional recommendation, low quality of evidence).*

This recommendation is based on 3 RCTs. One of these is in Uganda and two from Pakistan. The Ugandan and one Pakistan trial were based on TB. The other Pakistan trial was on hypertension. No systematic review and no other studies investigating the effectiveness of treatment supporters in CVD and its associated conditions have been identified. Whilst the paper on hypertension indicates that there may be some degree of effectiveness, the effectiveness of a treatment supporter was not the primary outcome of the trial. Data from the TB disease specific studies suggest that a treatment supporter may be beneficial in low resource settings for chronic diseases, however further research is needed to determine if it remains effective for other chronic conditions, in particular lifelong conditions. There is concern that the undesirable effects of the intervention may outweigh the desirable effects i.e. cost to patient.

Appointment reminders

If an individual fails to attend a review appointment, take action.

- **Phone** patient and encourage them to return.
- **Phone** treatment supporter and ask them to remind patient.
- **Send** reminder letter to patient if you cannot contact them.
- **Ask** someone e.g. CHW to home visit if patient does not return.

(Labhardt *et al.* 2011; Glynn *et al.* 2010; Kunutsor *et al.* 2010; Schedlbauer, Davies and Fahey 2010; Haynes *et al.* 2008; Khan *et al.* 2005)

If patient is not adhering to treatment or attending appointments:

- Do not criticise.
- Discuss any concerns or difficulties.
- Encourage the patient and treatment supporter
- Remind patient of treatment contract and the importance of continued medication.

If patient has stopped medication:

Check BP (see p12) and do lab tests as appropriate.

If results are high, review and start again as if new patient (see p6)

It is recommended that multifaceted interventions are implemented to improve adherence in CVD and associated conditions *(Strong recommendation, high quality of evidence).*

This recommendation is based on 4 Cochrane reviews looking at adherence in Type 2 diabetes, adherence to lip-lowering medication, adherence to medication in long term conditions and adherence strategies in hypertension. The majority of these found that complex multi-faceted interventions had positive outcome on adherence. (Glynn et al. 2010; Schedlbauer, Davies and Fahey 2010; Haynes et al. 2008; Vermeire et al. 2005)

It is recommended that individual patient reminders are given for follow-up appointments/missed appointments to increase patient contact with health care providers *(Strong recommendation, moderate quality of evidence).*

This recommendation is based on an RCT, a qualitative study, a cross sectional study and a number of disease specific and generic Cochrane Reviews on adherence to medication. Whilst these have identified various methods of reinforcement and patient reminders that can be effective in improving clinic attendance and drug adherence, it is acknowledged that these are often context specific. The methods recommended are those that are most appropriate to a low-resource context. The reviews conclude that any method of increasing patient-provider contact is likely to be beneficial to treatment adherence. In implementing the recommendation, it is imperative to take into account patient preferences and cost.

APPENDICES

Education leaflet

If you have hypertension, diabetes and cardiovascular disease improving your health is still important.

Hypertension is when your blood is at a higher pressure than normal.

You cannot give hypertension to someone else.

It is a lifelong condition that can be controlled with medication and lifestyle changes.

If it is not controlled, it can cause stroke, heart attack, kidney failure and death.

Type 2 Diabetes is when the body cannot use the food you eat, especially sugar.

You cannot give diabetes to someone else.

It is a lifelong condition that can be controlled with medication and lifestyle changes.

If it is not controlled, it can cause blindness, kidney failure, heart disease, disease of your blood vessels, poor erections and leg ulcers.

High blood sugars in pregnancy can damage your unborn baby.

Patients with diabetes can develop hypertension and the other way round, especially if overweight.

Attending the clinic and taking medication

It is important that you attend your appointments at the health clinic to see the doctor and the health educator.

Take a friend or family member (treatment supporter) with you to all your appointments.

It is important that you take your medication as given by the doctor, even if you feel well.

Do not miss doses of your tablets.

If you miss a dose do not take a double dose.

Do not share your tablets with other people.

If you think you are experiencing side effects, contact the health clinic.

If you have any questions about how to improve the way you live or the illnesses in this leaflet, please contact your local health facility.
Address:
Telephone no.:
Doctor/Health educator:

Date of preparation: Jan 2012

How to live a healthy life

A healthy diet, increased physical activity, not smoking and less alcohol are essential to improve your health and to prevent diseases like hypertension and diabetes

There are many ways that you can improve your health

Stopping smoking

Giving up smoking is the most important thing you can do to protect your heart and health.

If you smoke, you are more likely to have heart attacks, strokes, kidney disease, peripheral vascular disease and poor erections.

Other forms of tobacco are also bad for your health.

Smoking in the home can be harmful to your family.

If you want to quit smoking, it is important that you have support from your doctor and family.

Eating healthy food

Improving your diet can improve your health.

Eating unhealthy food can cause heart disease and strokes.

Try to:
· Eat locally available healthy food.
· Eat 3 regularly spaced meals per day.
· Drink water instead of tea or sugary drinks.
· Eat less fat i.e ghee.
· Use vegetable oil for cooking <1 tablespoon/day.
· Grill or boil food; avoid fried food.
· Eat fish and chicken rather than red meat, remove visible fat.
· Eat at least **5** fruit or vegetables every day.
· Add less salt when cooking.
· Avoid ready made or street food, home cooked is better.

Being active

Increasing physical activity will help keep your heart healthy.

A lack of physical activity increases your chance of having a stroke, heart attack and dying.

Try to do 30 mins/day of activity that makes you out of breath:
· Manual work e.g. farming
· Fast walking
· Cycling
· Use stairs rather than the lift
· Sports

Reducing alcohol intake

Reducing the amount of alcohol you drink will reduce the chance of developing heart disease.

Long term alcohol intake will cause heart disease, stroke and liver disease.

It is important to try to drink less than 3 units each day (1.5 pints of beer, 1 large glass of wine, 75ml of spirits).

If you have diabetes, alcohol can make you very ill with low blood sugar (especially if you are on insulin or sulphonylurea tablets).

If you want to change any of the behaviours discussed then please talk to your doctor.

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Treatment card and contract

<table>
<tr><td colspan="6" align="center">CVD/Hypertension/Diabetes TREATMENT CARD</td></tr>
<tr><td>NAME:</td><td>SEX:</td><td>DOB:</td><td colspan="3">Date first visit:</td></tr>
<tr><td>Village:</td><td colspan="2">Unique number:</td><td colspan="3">Treatment Supporter:</td></tr>
<tr><td>Ward:</td><td colspan="2">Phone:</td><td colspan="3">Relationship:</td></tr>
<tr><td>District:</td><td colspan="2">Nearest health facility:</td><td colspan="3">Telephone:</td></tr>
<tr><td colspan="6">Treatment contract: I understand that I have ……………………
I agree to attend all appointments, take my medications, be active, eat healthily and stop smoking.</td></tr>
<tr><td colspan="2">Patient's signature:</td><td colspan="3">Health worker's signature:</td><td>Date:</td></tr>
</table>

Date	SYMPTOMS Complications	Waist: <102cm (M) <88cm (W)	Blood Pressure <130/80 mmHg	Urine Dipstix (proteins/ketones/glucose)	Random blood Glucose <11mmol/l	Fasting blood Glucose <6mmol/l	Additional tests (i.e. HbA1c, chol, creatinine)	Disease education given?	Brief lifestyle advice given?	Education leaflet given?	Referred to health educator?	TREATMENT New drugs started, drugs stopped, side effects, advice	Date of next appointment	LIFESTYLE ADVICE Lifestyle to be addressed. Notes on progress.

It is recommended that all patients agree and sign a treatment contract agreeing to take responsibility for their role in their care plan *(Strong recommendation, moderate quality of evidence).*
This recommendation is based on a Cochrane Review on the effectiveness of treatment contracts for improving patient's adherence to treatment and a CRCT. The Cochrane Review included 4 papers on hypertension and 2 on diabetes, all in high income countries. A weak recommendation was concluded for the use of treatment contracts in high income countries for all diseases included in the review, based on 30 trials. The CRCT was undertaken in Cameroon, a low resource setting and involved a nurse-led intervention with hypertension patients and some diabetics. There was an improvement in clinic attendance. Clinic attendance does not necessarily result in drug adherence, although there is evidence for HIV that suggests a correlation.

Diabetes annual review card

DIABETES ANNUAL REVIEW CARD			
NAME:	SEX:	DOB:	Date of diagnosis:
Village:	Unique number:		Treatment Supporter:
Ward:	Phone:		Relationship:
District:	Nearest health facility:		Telephone:

Date	Vision loss/change Y/N /	Visual acuity e.g. 6/6	Fundus Normal? Y/N	Erectile problems Y/N	Planning pregnancy?	Feet examination Normal? Y/N			HBA1c <7%	Creatinine <160µmol/l	Total chol <5.2mol/l	Triglycerides <1.7mol/l	COMMENTS symptoms, examination, tests to do, advice given
						Touch	Vibration	Pulses					

CVD/Hypertension/Diabetes register

Name of Health centre: **District:**   **Ward:**

Entry Type (N/T/F)	Unique Number	Name	DOB	Sex	Address	Diagnosis		Date registered
					Telephone number	Primary	Other	
N	XXXXX	PETER MBARUKU	01/09/58	M				

Note for Entry: N = New Patient;   T = Transfer from another facility;   F = Re-entry when a previous row is full (after 12 attendances)
Primary diagnosis – initial diagnosis i.e. hypertension, diabetes or pre-diabetes
Other diagnosis – hypertension, diabetes, CVD (include specific condition i.e. heart failure)

Note: These two pages will be printed side by side, one patient one row.
The number of attendances in one row (12) is sufficient for three years, assuming one visit every three months.
When the row is full, a follow up entry should be added at the next available row in the register, with an entry type of "F".
The number of rows per page will depend on the length of the book chosen. **Ensure rows are properly aligned.**

ATTENDANCES (Enter date for each appointment attended) Indicate if visit is to the health educator (HE) for lifestyle interventions. If appointment with health worker and health educator occur on the same day, add 2 entries in 2 columns. Add codes: LOST - lost to follow up, DEAD - died, TOUT - transferred out. For each appointment, the date given should be entered above the dotted line and the date the patient attends added below the dotted line.											

Referral form

Transfer to		Transfer from	
Name of health facility		Name of health facility	
District		District	
Date of transfer		Clinician	
Patient details		**Treatment supporter**	
Unique identification no.		Relationship to patient	
Name		Name	
DOB		Contact details	
Sex			
Contact details			
Patient history			
Date first attended			
Primary diagnosis			
Secondary diagnosis			
Complications			
Current medications			
Recent clinical notes			
BP			
Wt			
BG			
Urine dip			
Other			
Reason for transfer			

Drugs for hypertension

ACE inhibitors (ACEi)
Enalapril 5mg OD (max 40mg OD) (WHO 2009)

Alternatives: Captopril 12.5mg BD (max 50mg BD)
                 Ramipril 1.25mg OD (max 10mg OD)
                 Lisinopril 5-10mg OD (max 80mg OD)
                                 (Joint Formulary Committee 2011)

Angiotensin receptor antagonist (ARB)
Losartan 50mg OD (max 100mg OD)
Alternatives: Candesartan 8mg (max 32mg OD)
                 Irbesartan 150mg (max 300mg OD)
                 Valsartan 80mg OD (max 320mg OD)
                                 (Joint Formulary Committee 2011)

Calcium channel blocker (CCB)
Amlodipine 5mg OD (max 10mg OD) (WHO 2009) or Nifedipine retard 20mg daily (max 80mg) (Joint Formulary Committee 2011)

Diuretics
Hydrochlorthiazide 12.5mg daily (max 50mg daily) (WHO 2009) or Bendroflumethazide 2.5mg daily (max 2.5mg daily).
If above not available then;
Chlortalidone 12.5- 25mg OD or Indapamide 1.5-2.5mg OD
                                 (Joint Formulary Committee 2011)

If heart failure, use Furosemide. 20mg daily (max 80mg). (WHO 2009)

If K <4.5mmol/l and optimum eGFR add Spironolactone 25mg daily (WHO 2009).

Beta Blockers (BB)
If history of angina/MI add Atenolol 2nd line 50mg daily (max 100mg) (WHO 2009)

If pregnant, Methyldopa 250mg BD/TDS (max 3g/daily) (WHO 2009)

Drug contraindications

Drugs	Contraindications
Thiazide diuretic	gout
Beta blockers (BB)	asthma chronic obstructive airways disease first degree heart block bradycardia <50/min Raynaud's
ACE-inhibitor (ACEi)	pregnancy hyperkalaemia bilateral renal artery stenosis
Ca-Channel blocker (CCB)	congestive heart failure aortic stenosis
Aspirin	peptic ulcer (and caution if dyspepsia)
Metformin	renal damage hepatic disease cardiac failure chronic hypoxic lung disease pregnancy or breast feeding
Sulphonylureas	pregnancy or breast feeding
Statins	myositis or myopathy

Major side effects

Drugs	Major side effects
Thiazide diuretic	muscle weakness (low potassium) increased serum cholesterol impaired glucose tolerance/diabetes impotence
Beta blockers (BB)	fatigue worsening of congestive heart failure swelling of face, mouth, hands or feet difficulty breathing (COPD and asthma) worsening calf pain (peripheral vascular disease) hypoglycaemia (can be masked in diabetes) weight gain depression impotence worsening dyslipidaemia in diabetes
ACE-inhibitor (ACEi) (especially with first dose)	cough difficulty in swallowing or breathing allergic reaction (sneezing, nasal congestion, itching or skin rashes) abdominal pain or swelling fainting, drowsiness, weakness or fatigue fast heartbeat headache nausea or vomiting diarrhoea abdominal cramps, pain or distension joint and chest pain foetal abnormalities high blood potassium hypoglycaemia
Ca-Channel blocker (CCB)	ankle swelling constipation fluid retention heartburn

Drugs	**Major side effects**
Aspirin	stomach pain
	heartburn
	nausea and vomiting
	gastrointestinal tract complications, bleeding
	and ulcers
	haemorrhagic stroke
	aspirin-induced asthma
Metformin	diarrhoea
	weight loss
	fast and deep breathing (lactic acidosis)
Sulphonylureas	hypoglycaemia
	weight gain
	water retention
	foetal abnormalities
	miscarriage
Statins	muscle pain/rupture
	muscle weakness
	neuropathy
	memory loss

The severely ill patient

Signs of severe illness:

- pulse >125bpm
- temperature >40°C (104°F)
- dry lips/tongue, sunken eyes (dehydration)
- increased respiratory rate, (pneumonia/ketoacidosis)
- wheezing or crepitations
- systolic BP <90mmHg (shock/ heart failure)

Refer to hospital if one or more of:
- became unwell rapidly
- reduced consciousness
- abdominal pain with vomiting
- rapid breathing, dry lips/mouth (dehydration)
- ketones in the urine (ketoacidosis)
- rapid weight loss

And if:
- <20 years (likely type 1 diabetes)
- suspected TB or HIV related illness e.g. pneumonia

While arranging transfer to hospital;

If dehydrated:
- Give frequent drinks, oral re-hydration solution if conscious or IV normal saline if reduced consciousness.

If BG <=2.8mmol/l:
- If able to drink give one large tablespoon/20-30g glucose mixed in water or 1 glass of fruit juice, honey or a sugary drink. If no response within 15 mins, repeat
- If unconscious/unable to drink, give 50ml 50% glucose IV if feasible.

If suspected poisoning/snakebite:
- Administer antidote if available. Consider gastric lavage to reduce absorption of poison

If convulsions/seizure in pregnancy:
- Give magnesium sulphate 4g IV over 5-15 mins or diazepam 10mg rectally

If suspected anaphylaxis:
- Monitor airway
- Give adrenaline 0.01mg/kg IM (side of thigh), up to max dose of 0.5mg. If no response, repeat every 5 mins
- Give hydrocortisone 100-300mg IV

If signs and symptoms of heart failure:
- Sit patient upright
- Give furosemide 40mg and digoxin 0.5mg as single doses

Acronyms

ACEi	Angiotensin converting enzyme inhibitors
ADA	American Diabetes Association
ARB	Angiotensin receptor blocker
BD	Twice a day
BG	Blood glucose
BP	Blood pressure
bpm	Beats per minute
CCB	Ca-Channel blocker
CHW	Community health worker
CRCT	Cluster randomised controlled trial
CVD	Cardiovascular disease
eGFR	Estimated glomerular filtration rate
FBC	Full blood count
FBG	Fasting blood glucose
GTT	Glucose tolerance test
HbA_1c	Glycosylated haemoglobin
HDL	High density lipoprotein
IDF	International Diabetes Federation
IGT	Impaired glucose tolerance test
IM	Intramuscularly
IMAI	Integrated management of adult and adolescent illness
IV	Intravenously
K	Potassium
LDL	Low density lipoprotein
Max	Maximum
MI	Myocardial infarction
NICE	National Institute of Clinical Excellence
NGO	Non governmental organisation
OD	Once a day
OGTT	Oral glucose tolerance test
QDS	Four times a day
RBG	Random blood glucose
TB	Tuberculosis
TDS	Three times a day
TIA	Transient ischaemic attack
WHO	World Health Organisation
yrs	Years

Useful resources

WHO Model Formulary 2008
www.who.int/selection_medicines/list/WMF2008.pdf

British National Formulary
http://www.bnf.org/bnf/

WHO Integrated Management of Adolescent and Adult Illness (IMAI)

- Acute care:
www.who.int/hiv/pub/imai/en/IMAIAcuteCareRev2.pdf

- General principles of good chronic care:
www.who.int/hiv/pub/imai/generalprinciples082004.pdf

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