

**Type 2 Diabetes,
Cardiovascular disease,
Obesity and Hyperlipidaemia
Care in adults**

Case Management Desk Guide

**The COMDIS HSD Generic
of
11th April 2011**

Introduction

The Goals and Objective of this desk guide is to screen, early detect and manage initially patients with type 2 diabetes mellitus, and its related conditions - hypertension, obesity and hyperlipidaemia, alcoholism and smokers in a local health unit in primary care or the district hospital OPD. It is to educate patients about lifestyle measures and specific treatments so that they can take responsibility for their own care. It is a concise "quick reference" guide for doctors, clinical officers, paramedics, nurses and counsellors providing routine care and health education. There is provision for monitoring and evaluation of management to prevent complications and untimely death. It clearly indicates when referral to district hospital and assessment by a more senior clinician is appropriate. However once stable, they may then be referred back with a care plan for follow-up at the nearest health unit. It is expected that ministry of health and NGO country partners will, through a working group process, adapt these guidelines and the related modules and tools, to the local health service context, staff, drugs, basic equipment, tests (and units) prior to pilot, evaluation and scale-up in that country.

The guidelines are based on WHO "Package of Essential Non-Communicable Disease Interventions (PEN) for Primary Health Care, and hypertension guidelines as well as International Diabetes Federation (IDF) guidelines and other clinical evidence.

This generic version was drafted by Dr Kirti Kain, Senior Lecturer in Diabetes/Academic General Practitioner and John Walley, Professor of International Public Health/ General Practitioner, University of Leeds UK. The materials have been improved following expert review by Professor Andrew Swai of the MoH and Diabetes Federation Tanzania and colleagues in a expert working group exercise and pilot course.

Comments on these interim guidelines are welcome to j.walley@leeds.ac.uk

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Identify chronic diseases

Keep this page open as you see routine consultations

- If acute illness - diagnose and treat, see 'Std Treatment Guidelines Tanz' or IMAI.
- If > two weeks, or <2 weeks but recurred in the last year, consider chronic disease.
- HIV - counsel and test all attending patients, unless done recently; especially if symptoms/signs that could be HIV related (unless patient refuses).
- **If look severely ill:** rapid pulse >100/minute or breathing >30/minute or low BP <90/60mmHg, or if lips are "blue", or if confused -urgently resuscitate, treat, stabilise & refer.

Consider:

Cardio-vascular disease if symptoms of:

- Chest pain
- Breathlessness (if < 2 weeks consider pneumonia, >2weeks do TB sputum smears)
- Ankle swelling in both legs
- Pain in the back of the legs on walking
- Slurred speech, one-sided weakness

Or a **past** history of:

- High blood pressure?
- A Heart attack? *Chest pain more than half hour at rest?*
- Angina? *Chest pain for few minutes on exercise, going away at rest?*
- Heart Failure? *Short of breath? Ankle swelling?*
- A Stroke? *Sudden one sided weakness? Or slurred speech or visual loss?*

- Claudication? Pain in the back of lower leg on walking?

If any present check BP, and if $>140/90$ see pages 26-29, and other relevant exam.

Diabetes, do blood or urine glucose and see pages xx if:

If symptoms of lethargy, thirst, polyuria, recurrent infections (e.g. urine, skin, thrush)

If so do HIV test. Consider and treat urine infections.

High risk for non communicable disease if a man > 50 or woman > 60 years smokes; is looks/ is over-weight; drinks excess alcohol. If so, see page below.

Education

Healthy eating

Advise locally available healthy food and less refined food - so as to lower weight, blood sugar, fat and blood pressure. Specifically advice and counsel:

- Eat breakfast, lunch and evening meal - evenly distributed throughout the day.
- Eat fresh fruit and vegetables with peel each day; at least 3 servings of fruit and 3 of vegetables a day
- Eat fish and chicken rather than red meat, remove visible fat.
- No need for special diabetes food or nutritional supplements products
- Ensure intake of 2 litres of safe and clean water a day depending on the age
- Drink little or no alcohol (<2 drinks /day men , < 1 women), it can make you very ill with low blood sugar (especially if on insulin or sulphonylurea tablets)
- Avoid sugar or sodas - but can use artificial sweeteners
- Encourage use un-refined food/cereals.
- Reduce fats - especially animal fat, coconut milk or palm oil. Use vegetable oil, < 1 tablespoon per day for cooking
- Add only a little salt when cooking, but not at the table (< 5g/day per person).
- Eat as the family - healthy eating is good for the whole family members with or without diabetes!
- Avoid ready made or street food, as is unhealthy with a lot of fat and salt, home cooked is better
- Avoid fried food; grill, boil or steam food for shortest necessary time.

Daily Activity

- Carry out activity which you enjoy and which you can do everyday
- Be active - examples of daily activity are:
- fast walks,
- cycle,
- field work,
- use the stairs rather than the lift,
- jog or run,
- swim,
- use jumping rope,
- dance
- football or basketball that

Have daily activity - for at least half an hour a day.

Stop smoking

At initial consultation ask if the patient smokes. Ask if they have thought of stopping.

At each follow-up visit ask if still smoking and assess their motivation to stop then.

Advise to stop smoking in clear, strong and personalised manner say.

- If you continue to smoke, are more likely to have impotence (men), strokes, kidney disease, heart attacks and peripheral vascular disease.
- Giving up the smoking is the most important thing to do to protect heart and health.
- Have you thought about stopping smoking, if so, agree with them a date to stop "quit date".
- It is difficult to stop, best ask non smoking family and friends to help you.
- Avoid the company of smokers, and be strong if people offer you a cigarette.

Assist in preparing a quitting plan

- Set quit date
- Inform family and friends
- Ask for their support
- Remove cigarettes/tobacco
- Remove objects/articles that prompt you to smoke

Arrange follow-up, reinforce success. Otherwise start the process again, with more frequent (e.g. monthly) follow up and seek more support from the family and friends. Encourage all non smokers not to start smoking. Individuals who use other forms of tobacco should be advised to quit.

Stop Alcohol

Alcohol abstinence should be reinforced.

People should not be advised to start taking alcohol for health reasons

Men who take more than 2 drinks per day and women who take more than 1 drink per day should be advised to reduce. No more than 5 times per week. One unit of alcoholic drink is defined as the equivalence of 10-12 g alcohol (One unit = 340ml of beer/lager (5% alcohol), 120 ml small glass of wine (10% alcohol), 25 ml of spirits (40% alcohol))

A long term chronic intake of >3 drinks of alcoholic beverages per day is associated with adverse effects of alcohol consumption such as hypertension, stroke etc

Advise patients not to use alcohol when additional risks are present, such as:

- driving or operating machinery
- pregnant or breast feeding
- taking medications that interact with alcohol
- having medical conditions made worse by alcohol
- having difficulties in controlling drinking.

Weight Loss

Weight loss is an important feature of many diseases that should be detected early and managed. It may be defined as unintentional weight lost > 10% of usual body weight in the last three month or > 5% in the past month.

The major common conditions associated with weight loss include the following:

Conditions associated with poor appetite

Tuberculosis

Cancer

HIV/AIDS

Conditions associated with good appetite

Diabetes

Thyrotoxicosis

Suspect diabetes

Screen with blood or urine glucose test if have symptoms that may be due to diabetes, including:

1. Feeling weak, tired all the time
2. Thirst, wanting to drink, even at night
3. Frequency of urine (cloudy), even at night,
4. Infections, recurrent e.g.:
 - a) sore vagina, discharge, thrush penis itchy
 - b) boils, styes, skin boils (bacterial),
 - c) cough, recurrent chest infections (if > 2 weeks also do sputum smear for TB)
 - d) athletes feet, itchy rash in flexures (intertrigo)
 - e) burning or cloudy urine
5. Weight loss, unintentional, unexplained, good appetite
6. Vision getting worse
7. Pins and needles (paraesthesia), tingling sensation, in the feet

Screen as risk of diabetes (even if no "diabetes" symptoms): Also check the BP - see page 26 below

1. Looks overweight or large waist
 - waist > 102 cm men, > 88 cm women,
 - or BMI > 30 (obese)
2. Known hypertension, history of chest pain (myocardial infarction, angina) or stroke
3. Close family history diabetes
4. Pre-eclampsia, large baby > 4kg, or stillbirth.

If appear very ill fast track to hospital (see page 35)

Assess for CVD risk factors

Ask about smoking, family history of heart disease or stroke etc. Check BP and waist, in people who look over-weight (especially men over 40 and women >50 years), then if

- waist > 102cm men, > 88cm women - see p31 below
- check BP, if > 140/ 90 - see p 26 below)

Manage individual risk factors, see sections below. If over 50 years and ≥ 2 of the following CVD risk factors:

If ≥ 2 of the following CVD risk factors:

- large waist > 102 cm men, > 88 cm women
- hypertension*
- smoker
- family history of CVD (parents, brother or sister had stroke or heart attack; men < 55yrs or woman <65)
- known diabetes

Commence aspirin 75mg once a day, unless contraindicated - a history of indigestion, or develop ulcer in stomach, black stools, or any bleeding disorder or uncontrolled BP. *Only start aspirin when BP controlled <140/90mmHg). And commence a Statin, unless contraindicated, if feasible/affordable.

NB. High alcohol intake (> 2 drinks/ day men, 1/day women) is also risky for health, and should be stopped (and once stopped then aspirin can be commenced).

Diagnosis of diabetes

Check blood glucose

One normal value excludes diabetes (Normal RBG <11mmol/l or FBG < 6.1mmol/l. (Normal range 3.9-5.5mmol/l))

If first RBG test **high** >11mmol/l, then **repeat** with a **fasting** blood glucose, e.g. next morning.

- If the FBG >7.0mmol/l this confirms diabetes.
- If FBG not possible, then a second high RBG confirms.

Two high BG values confirm **diabetes** (raised 2xRBG or 2xFBG, 1xRBG and 1xFBG, or) confirm diabetes if:

RBG > 11 mmol/l

FBG > 7.0 mmol/l

Pre-diabetes if two BG are in-between normal and diabetes values: RBG between 7.9 -11 mmol/l or FBG between 6.1 - 7 mmol/l means impaired glucose handling - pre-diabetes. See page 38.

NB. If blood glucose not available test urine glucose.

Keep a copy of this page as a "poster" in clinic room.

Case management in general

Educate: Explain diabetes, the need for follow-up. See page below.

Record and give appointment date:

- Record on the treatment card (or exercise book)
- Give a patient card (diagnosis, drugs, appointments)
- Record treatment supporters and patient's phone, address and clinical details on treatment card and register.

Request hospital/doctor opinion if

- **All type 1 diabetes**
- **Ketosis** (ketones in urine, severely ill, see p7)
- **Pregnant women** or
- **Adult Type 2 diabetes**, with complications e.g. :
 - altered consciousness with too low or too high glucose (< 4 mmol/L or > 20mmol/l)
 - BP > 220/120 (or > 130/80 despite maximum treatment)

Any patient (diabetes or high BP etc.) patient with complications such as:

- Chest pain and breathlessness due to angina, heart attack or heart failure
- stroke/ transient ischaemic attack (TIA)
- pain in the calf when walking due to peripheral vascular disease (may have absent pulses)
- vision loss, retinopathy, cataract
- feet and hands pins and needles or numbness (paraesthesia due to neuropathy).
- kidney disease
 - microscopic haematuria or casts
 - proteinuria > 3g/L or
 - creatinine > 160 micro moles/L

Manage uncomplicated diabetes

- In general, details below.

Diabetes patients need care for life. Manage uncomplicated cases in the nearest health unit, as below. Refer for advice from the hospital doctor/ specialist if unstable or if complications arise; then continue care according to the revised care plan.

Presenting visit, when diagnosed

Educate/ counsel (a two-way discussion) on diabetes, complications and associated conditions - BP, blood lipids, healthy eating, activity, weight, smoking, and aspirin (if 3+ CVD risk factors, and not contraindicated).

First follow-up visit at 1 week

Further counsel on key information

Examine for signs of complications (see page 15)

Second follow-up after 1 - 2 months

Start tablets if:

FBG > 7.0 mmol/l or

RBG > 11 mmol/l, or

HBA_{1c} > 7% (if available)

Reinforce education; healthy eating, physical activity (exercise) daily, foot care, etc.

Subsequent follow-up 3 monthly, then 6 monthly when BG stable (less than the BG levels above)

- keys questions and essential exam
- education, discuss care options (encourage they take responsibility for their own health)
- send for follow-up and tests if requested by hospital/specialist.

See page 20.

Education information on diabetes

For the initial *and* follow-up visits - reinforce these messages, and don't assume they remember what you said previously! Add additional information as required, e.g. change in medication. Use the local common language they can understand. Ask them to repeat key points you've said. Ask if they have any questions.

Diabetes is:

- When the body cannot properly use the foods we eat, especially sugar due to lack of insulin
- Insulin enables the body to use sugar from our food.
- Insulin works best if we are not overweight and have more physical activity.
- If you remain overweight and have little physical activity, then the blood **sugar remains high** - making you ill.
- Also little insulin causes the liver to produce sugar.
- As well as sugar, there is too much blood fat. Symptoms result from the raised blood sugar, fat, - and may also be due to raised blood pressure.
- Over years this leads to damage to body organs (as page below).
- But with a healthy diet and increased daily physical activity for life - helps lower blood sugar, - if so, you can live a largely normal life
- avoid pregnancy if blood glucoses are high
- to stop smoking and drinking alcohol
- do not stop treatment, even if symptoms get better
- ask for help if you feel ill or tired
- you can't catch or give diabetes to somebody

- treatment is life-long
- is managed best with a regular daily life routine.

Complications

You will need to explain to the patient at a number of visits, so they understand that:

High blood glucose (sugar) damages the blood vessels and the body organs.

Healthy eating, physical activity and tablets are needed for life - to keep the blood glucose down.

If not then it can cause blindness, kidney, heart and other problems, such as:

- Poor vision
- Severe tiredness, bloody urine - kidney disease
- Feet numbness, ulcers and damaged feet.
- Shortness of breath from heart disease
- Strokes
- Pain in the calf on walking
- Impotence.

Explain diabetes treatment

Explain the treatment/tablets they need to take, say:

- Know the name, colour, dosage and number of each tablet and injection
- Take your pills daily as prescribed, at the same time each day, e.g. Metformin after eating
- Never take anyone else's diabetes pills
- If you forget pills, don't take an extra dose next time
- Do not change how many pills you take, unless the health worker tells you to do so
- Drugs, especially insulin and sulphonylureas, can cause low blood glucose especially if a meal quantity is small, is missed or delayed, or if daily activity is increased
- If on insulin injections:
 - *must monitor blood glucose themselves or attend clinic weekly,*
 - inject under the skin as shown (not in muscles, ie subcutaneously) on abdomen and/or thighs,
 - more likely to suffer from too low blood glucose in the blood; can retain fluid and become fatter
- Be aware of side effects of your drugs (page 41); tell the health worker about these.

Signs and treatment of hypoglycaemia

Educate patient and family members about the risk of hypoglycaemia (too low blood sugar) if:

- they are on *sulphonylureas* i.e. *Glimperide*, *Gliclazide* or insulin injections
- they miss or have a small meal (if on tablets)
- increase daily activity more than usual
- drink alcohol, especially if without food

The symptoms are:

- shakiness
- fast heartbeat
- hunger
- irritability
- cold sweat
- dizziness
- headache
- pale or moist skin
- confusion
- anxiety
- weakness

Action:

- **quickly drink a glass of a sugary drink e.g. coke/fanta**, or eat one tablespoon of sugar/honey (placed under the tongue for quick absorption into the blood stream) then a snack such as bread, if conscious.
- if unconscious, they urgently need, intravenous 10-20 grams of 20% or 50% dextrose, or 5% dextrose, if IVI not available then by naso-gastric tube (or best, if available, a glucagon injection 1mg i/m, s/c).

The treatment supporter

Explain why a treatment supporter is needed:

- Treatment is life-long, so support is needed
- Many patients forget to take tablets when they start feeling well after a few weeks of treatment. Regular intake of treatment is vital
- Listening to and encouraging diabetes patients and their families is a key part of being a treatment supporter.
- **Discuss** who would be the best treatment supporter; someone concerned, trusted and committed to providing the support
- **Ask** the patient to **choose** someone, as the best treatment supporter; e.g. a family member or friend or community volunteer
- Write name and phone details on treatment card
- Record the name, address and **mobile phone** number on the treatment card.
- Ask the patient to bring the Treatment Supporter with for the next visit and subsequent visits - to learn about the illness, treatment and their role.

Explain the role of a treatment supporter:

Meet with the patient often; make this a enjoyable social time. If possible, meet at the time the patient takes their tablets and see them taking the tablets as prescribed.

The treatment supporter should look at the tablet pack to see that the number of tablets is correct for the number of daily doses that should have been taken.

The treatment supporter should inform the health worker if the patient stops taking their tablets.

Communicate about care – general points

Use non technical and local language. Improve the attitude, ability and confidence of treatment supporter/ family member attending:

1. Explain treatment options; help the patient to decide the best care plan (diet, activity, tablets).
2. Let them take responsibility for their own care
3. Let patients express their feelings and anxieties
4. Clarify their myths and misconceptions
5. Explore their cultural issues health beliefs, traditional remedies and advise
6. Give them time to accept and adapt to the diagnosis (of diabetes, hypertension etc.)
7. Encourage the patient that he/she will feel better
8. Do not criticise if patient misses tablets is not taking treatment or the test results are high.
9. Ensure they know:
 - what to do for healthy eating and life-style, including daily physical activity.
 - Ensure they know the more common and serious side effects of drugs and know what to do. If necessary to see the health worker.
 - that even if they have no symptoms that the disease is still there, so continue treatment and keep appointments.
 - which tablets and how many tablets to take and when – give enough until the next visit.
 - are likely to need insulin injections eventually
 - importance of taking all related treatments e.g. for blood pressure.
 - the date of the next appointment.

Follow-up visits - essential actions

In all patients with diabetes, hypertension etc., look at and record on treatment card.

At each review take a history

- Ask how they are, any new symptoms?
- Any concerns or questions?
- Change in symptoms since last visit?
- Ask more about symptoms mentioned
- Headache, chest pain, breathlessness (hypertension, angina, heart failure)?
- Lifestyle: healthy eating, daily physical activity, stop smoking, less alcohol
- Self monitoring skills and equipment problems?
- Last menstrual period in women (13-49 years)
- What drugs, how many times are being taken?
- Ask about problems taking medicines (adherence)?
- If using insulin, ask about storage
- Ask about
 - o vision problems,
 - o impotence, and
 - o side effects of medications (see appendix)

In diabetes patients also ask about:

- o Thirst, urinary frequency, burning
- o feet problems; numb, tingling, pain
- o infections

Look for signs related to symptoms.

Do the tests, see page below.

Record all new symptoms on the treatment card.

Diabetes follow-up exam and tests in patients:

3 monthly examine (see IDF page 7):

- RBG, FBG (aim: FBG < 7mmol/l; RBG < 11mmol/l HBA_{1c} < 7%) - if raised adjust treatment
- Check injection sites if on insulin
- BP (aim <130/80),
- Weight, waist -advise lifestyle and treatment
- Feet; sensations, foot wear
- Urine dipstix: if glucose or ketones exclude diabetes - if protein or blood - and if symptoms of UTI give antibiotics - if not refer as possible kidney disease.

If new symptoms, ask and examine as relevant

Yearly examine, in addition to the above, as below

- Heart, lungs and ankle swelling.
- Vision chart, cataract, retina
- Feet; sensations, foot ware
- full blood count, creatinine, total cholesterol, triglycerides (if available)

If CVD complications refer and/or see IDF p 29-44.

No- diabetes patient follow-up exam and tests

Hypertension, obesity, high lipids, as page above and:

- BP (aim <140/90)
- Weight, waist - counsel on lifestyle and treatment
- Urine dipstix: if glucose or ketones exclude diabetes - if protein or blood - and if symptoms of UTI give antibiotics - if not refer as possible kidney disease.

Also see specific sections below.

Give a new appointment, record on cards and register.

Diabetes control

Start with diet and increased physical activity (BUT if already complications or if RBG is > 15 mmol/l or FBG > 11 mmol/l add Metformin, or a sulphonylurea if Metformin contraindicated (see below).

Ask what questions they have.

Ask, educate and counsel on:

- healthy eating, physical activity, smoking, alcohol
- low mood,
- erectile dysfunction, other complications

Review and adjust **medications** (diabetes, BP, lipids)

- adherence
- side effects
- adjust dose, increasing to maximum tolerated effective dose, or decrease if side effects
- give 3 months trial of diet and exercise alone; if as needed add a drug and increase (not less than 2 weeks) step by step. If needed, after 3 months, add another drug step (see IDF page 23). If a drug is not available use alternative from same group
- add another drug (up to three drugs) if maximum tolerated dose of one agent achieved and blood glucose not controlled (RBG > 11 mmol/l, FBG > 7.0 mmol/l or HBA_{1c} $> 7\%$)
- **Self monitoring** and recording; do blood or urine glucose test before breakfast and 2 hours after a meal once a week, or more frequently if poor glucose controlled or if on insulin - adjust frequency as affordable. When patient is knows well their diabetes, they be allowed to adjust their own doses.
 - *Blood glucose measurements especially if on insulin*
 - *Urine ketones when infectious illness and if poor control*

Diet and daily activity only

Advise on healthy eating, brisk walking or other daily activity; and reinforce advice on each visit (see p 13).

Oral hypoglycaemic drugs

Start with one, review at local health unit every 3 months, adjust as necessary, to the maximum dose of drug or as tolerated, then add one of the next type, up to 3 as needed until BG controlled FBG < 7mmol/l or RBG < 11mmol/l, HBA1C < 7%.

Start with Metformin especially if overweight. If Metformin contraindicated or in thin patients start with a sulphonylurea.

1. Biguanide (Metformin)

Give 500mg once a day for two weeks, if tolerated increase to twice daily for another 2 weeks. If tolerated increase to three times daily. Review in 3 months, if BG test is still too high increase dose to 1g x3/day.

The slow increase is to minimise patients getting nausea, diarrhoea, bloating. Though unpleasant these are minor side effects and help them loose weight and control BG. These side effects get less with time. Avoid in pregnant women or seriously ill patients.

2. Sulphonylurea

Add (or first line in normal weight people):

- **Glibenclamide 2.5mg daily (up to max 15mg)**
- **Chlorpropamide 250mg daily (up to max 1g)**

Be aware of prolonged hypoglycaemia

Others are expensive and not on the essential drug list:

- Gliclazide 80mg daily (up to max 160mg) or
- Glimperide 1 mg (up to max 6mg) daily
- Glipizide 5mg daily (up to max 15mg).

3. Glitazones (Pioglitazone)

Add, starting with 15mg (max 45mg) daily or

4. **Acarbose** start 50 mg daily, increase up to 3x/day.

[if not available, go to next step]

5. Insulin - If after 3-6 months on diet and 3 drugs (one of each of the above types of oral drugs) the RBG is still $> 11.1\text{mmol/L}$ or FBG $> 7\text{ mmol/l}$ or $\text{HBA}_{1\text{C}} > 7\%$, then **refer**.

Consider:

Is patient willing and capable to start insulin?

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 once a day
- mix of short and intermediate acting twice daily
- short acting three times a day
- short acting three times or long acting once a day

Stop the Pioglitazone, but may continue Metformin and sulphonyl urea when starting insulin.

Insulin dosage and frequency depends on many factors. It should fit in with the patient work-life daily routine. Ask about their job, meal and sleep times routine, weekend activities etc.

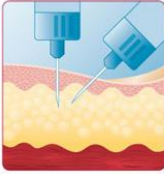
1. If regular meals and activity give insulin twice a day insulin injection. If not, insulin three or even four times daily may be needed
2. Use locally available long acting insulin at start
3. Age - younger people will need less if they are more active
4. Weight - heavier people need more
5. Duration and phase of diabetes - more insulin if diabetes for a long time
6. State of injection sites - inject into *stomach (belly)* or thighs not the arms, less needed if sites are lumps free (no hypertrophy or atrophy). Rotation of injection sites is recommended to reduce insulin injection site damage

7. Physical activity - requirement decreases if person becomes more active
8. Results of BG monitoring and HBA_{1c}
9. Other infections/ illness - requirement increases
10. Other treatments (beta blockers etc.)

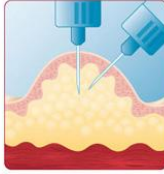
Patient or treatment supporter should be capable of using appropriate device (pen, cartridges, syringes) - have good vision and good use of hands.

Advice/ warnings

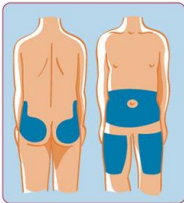
1. **monitor** them weekly in the beginning then monthly, when controlled to 3 monthly
2. **subcutaneous** injection on abdomen and thighs not by mouth.
3. patients are more are more likely to get **low glucose** (hypos) with insulin
4. patients are more prone to becoming **fatter** (weight gain)
5. **fluid** retention.



No-pinch technique
Straight in and an angled injection



Pinch technique
Straight in and an angled injection



**Possible Sites
For Injection:**

Upper thigh + buttocks
Slow insulin absorption

Abdomen
Quick insulin absorption

Blood pressure control

Diabetes, obesity and hypertension are linked diseases. Patients with Diabetes eventually get raised BP and the other way round, especially if overweight.

Diabetes:

- Diagnose hypertension if BP remains high on three different occasions. In diabetes high BP is systolic > 130 , or diastolic over 80mmHg (especially if renal complication present).
- Start with education, diet and physical activity.
- Review 3 monthly. Repeat education, check BP.
- Start medication if BP remains $>130/80$, or if have symptoms of headache or dizzy spells, or if have CVD complications (page 10 or below).

Start with ACEi or diuretic as first line (below)

No diabetes

- if no CVD/ complications (see list below), and no other risk factors present - then educate on healthy eating and activity and only treat if BP $> 160/100$

- if 140-160 / 90-100 then educate on healthy eating and activity only (if no CVD/ complications, or other risk factors present) but if

- have CVD/ complications and /or 2 or more risk factors (page 10) present then educate on healthy eating and activity and treat if BP $> 140/90$.

Start with a diuretic and/or calcium channel antagonist until BP $< 140/90$.

- All patients to be reviewed every 3 months,

See IDF/ SSA guidelines for doses, or the "Standard treatment guidelines" or National Essential Drug List (NEDL).

Education, diet and activity

- For diabetes, as above, plus:
- High blood pressure can be treated - but if not treated then can cause stroke, heart attack, vision defects and kidney failure.
- Life long treatment
- Take the correct tablets regularly!
- Must stop smoking (as below).
- Start aspirin (if 3+ CVD risk factors, from when BP is controlled, if not contraindicated,)
- Need regular check up of blood pressure and blood and urine tests.

Anti-hypertensive drugs

If BP still too high (130/80 in diabetes patients), increase dose (to the maximum), then **add** other drugs as required.

- If BP still high increase dose
- Add one drug at a time, starting at the lower dose, if BP still raised increase step by step if required to the max prescribable dose or max tolerated dose.
- A maximum dose 4 or more drugs may be required to get to, or near to, normal values. BP control is critical, especially in subjects with diabetes!

1. ACE inhibitors (ACEi)

Captopril 12.5mg tds (max 50mg bd) or

Enalapril 5mg od (max 40mg od) or

Ramipril 1.25mg od (max 10mg od) or

Lisinopril 2.5mg od (max 40mg od) or

angiotensin receptor antagonist:

Losartan 50mg od (max 100mg od) or

Candesartan 8mg (max 32mg od) or
Irbesartan 150mg (max 300mg od) or
Valsartan 80mg od (max 160mg od)

- Start with lowest dose (take first dose before going to bed) and increase weekly. Say to report if severe dizziness (hypotension).
- if ACEi not available, start with Amlodipine .
- *Do not use ACEI or Angiotensin RAs in women who may become pregnant (use methyl dopa or refer to specialist)*

2. Diuretic e.g. Bendroflumethazide added

Start as 2.5mg daily (max 2.5mg daily) or Hydrochlorthiazide 12.5mg (max 25mg od).

Frusemide added if patient has heart failure (instead of bendroflumethazide). Start at 20mg daily (max 40mg)

3. Calcium channel blocker eg. Amlodipine added (Start as 5 mg daily (max 10mg)

4. Beta Blockers eg. Atenolol added 2nd line if history of angina or myocardial infarction

Start as 50 mg daily (max 100mg daily)

5. Alpha blockers - Doxazosin

Start as 4mg daily (max 8mg)

6. Spironolactone 100mg daily.

7. Methyl Dopa 250mg tds (max 3g/daily) or **Reserpine** 0.1mg od (max 0.25mg/day)in pregnancy.

Refer to Physician /specialist if

- BP still > 130/80 in patients with diabetes in spite of 4 or more drugs treatment (>140/90 in subjects without diabetes with CVD or > 160/100 if no diabetes or CVD).
- Patient gets pregnant (Methyldopa, calcium channel blockers, Diuretics)

Refer any patient **with/without diabetes** with complications such as:

- chest pain and breathlessness due to angina, heart attack or heart failure
- stroke/ transient ischaemic attack (TIA)
- pain in the calf when walking due to peripheral vascular disease (may have absent pulses)
- vision loss; retinopathy, cataract
- feet and hands pins and needles or numbness (paraesthesia due to neuropathy).
- kidney disease
 - microscopic haematuria or casts
 - proteinuria dipstix positive (1+ or more) on two or more occasions
 - creatinine > 1.8mg/dL (160 umoles/L) or rise if more than 10% from previous level

Weight control

Over weight is:

- BMI is > 25 (kg/m^2)
- waist 102 cm men, 88cm women

Healthy eating and increased physical activity is important for all to achieve and maintain ideal weight.

It is especially important in CVD or hypertensive patients with or without diabetes. If weight or waist circumference remains high, re-emphasise the need for weight loss.

Education, diet and activity

Educate and counsel on healthy eating and daily activity (as above for patients with diabetes and BP).

Review after three months (earlier if symptomatic or has complications).

Anti-obesity drugs

If available, and if BMI >30 , give Orlistat 120mg tds (max 120mg tds), but stop if no weight loss after 12 weeks.

If also other CVD risk factors, consider Aspirin.

Lipid control

Check lipids at the beginning in patients with CVD (at three months in patients with diabetes but without CVD), and yearly thereafter.

High is:

- total cholesterol > 5.2 mmol/l,
- LDLc > 2.6 mmol/l or
- HDLc < 1.1 mol/l
- Triglycerides > 1.7 mmol/l

Education, diet and activity

Educate and counsel on healthy eating and daily activity, as above for diabetes and high BP. *Generally* give three months, repeat lipids.

Lipid lowering drugs

If lipids cholesterol (LDL) remain high after 3 months, then refer/treat. Give a statin e.g. Atorvastatin or Simvastatin 20mg daily (max 40mg).

If fasting triglycerides > 1.7 mmol/l), add Fenofibrate or Clofibrate. Or if only triglyceride raised then fibrate alone (without a statin).

Missed appointments, adherence

Record the name, contact address, mobile phone number (patient, family, treatment supporter) and appointment date on the treatment card and register.

At all appointments ask if tablet taking is regular, if tablets have been missed.

Do not criticise!

Ask patient and relative if still taking their treatment

- if so, continue as for a follow-up appointment (in diabetes do the FBG) and review treatment etc. and discuss the importance of not missing review appointments.

Take action if don't come for appointment or some days later:

Call mobile phone number, encourage them to return.

If can't contact, or don't return, ask someone e.g. a community health worker, to do a home visit if feasible.

If stopped medications, in patients with diabetes do the FBG or RBG or HBA_{1c}. Check BP, etc. as applicable.

If results high review and start again as for a new patient; as above, educate, re-start treatment etc.

Summary follow-up, key tests and drugs

At reviews see the tests, values and actions. If raised increase dose or add medication. If intolerant reduce or use alternative drug.

For All. Emphasise healthy eating and daily activity - daily or at least 3/week, e.g. walking to work.

1. If more than 3 CVD risk factors (e.g. diabetes and over weight raised BP, high cholesterol, smoker, alcoholic, family history of heart disease or stroke etc) commence **aspirin** 75mg once a day unless contraindications (a history of indigestion, or develop ulcer in stomach, black stools, or any bleeding disorder *or uncontrolled BP>140/90*).
2. Diabetes patients do BG: if FBS > 7mmol/l, RBS > 11 mmol/l or HBA_{1c} > 7% (i.e., too high) increase dose or add medication. If not responding after reaching the max dose of 3 oral diabetes tablets refer to consider insulin.
3. BP: if >130/80mmHg in diabetes patient or if dipstick for proteinuria then >125/75mm Hg add dose or drug.
4. Lipids - if total cholesterol > 5.2 mol/l, or triglycerides > 1.7mmol/l or HDL < 1.1mmol/l - review healthy eating, activity, and add drug if appropriate
5. Weight: if BMI > 25 or waist 102cm men, 88cm women, review healthy eating and activity.
6. Serum creatinine if high > 160 µmol/l, stop Metformin and refer (to assess cause)
7. If persistent proteinuria (or microalbuminuria) - start on angiotensin converting enzymes (ACEi) - low dose and gradually increasing the max dose

8. If impotence, check BP is controlled; if severe CVD (chest pain or breathlessness, palpitations) refer; if not, and can afford, treat with Sildenafil (Viagra).
 9. If eye problem (loss of vision, blurred vision, floaters, or cataract) refer.
 10. If foot problem (numbness, paraesthesia, wounds or ulcer, absent pulses, calf pain on walking) refer.
-

Pre-diabetes is confirmed if the result is in between the normal and high values (RBG: 7.9 -11mmol/l or FBG 6.1 - 7 mmol/l). Pre-diabetes may go on to develop diabetes in the future. They do not need drug treatment at this stage, but should be given healthy lifestyle advice (pages 4-8). They should have their blood glucose rechecked every year (or six monthly if they also have other cardiovascular disease (CVD). If become pregnant refer - because of risk of complications in mother and baby.

Severely ill?

Refer the severely ill (and may be type 1 diabetes) if one or more of:

1. Became unwell rapidly
2. Altered state of consciousness
3. Abdominal pain with vomiting
4. Rapid weight loss
5. Rapid breathing, dry lips, mouth (dehydration)
6. Ketones in the urine (ketoacidosis)

And if:

7. Under 20 years (likely type 1)
8. Suspected severe TB, HIV related illness e.g. pneumonia.

General signs of severe illness:

- Pulse rate: 125 or more per minute
- Temperature: 40° C (104°F)
- Dehydration (dry tongue, lips, sunken eyes)
- Respiratory rate, if high, may be pneumonia, but also present in ketoacidosis
- Wheezing or crepitations BP systolic < 90 suggests shock/ heart failure

Refer urgently. Before patient is transferred to hospital, if dehydrated and conscious give frequent drinks, oral re-hydration solution or if comatosed i/v normal saline, depending on availability.

Also refer a thin young person < 20 years as may be *type 1*, if you suspect tuberculosis or HIV, pneumonia, appendicitis or thyrotoxicosis (symptoms similar to diabetes).

The Unconscious or Semi Conscious Patient

There are many causes (including diabetes and stroke) but all patients require attention before referral, as in table below.

1 ST Group of Actions	2 ND Group of Actions	3 RD Group of Actions	4 TH Group of Actions
<ul style="list-style-type: none"> • Place unconscious patients in lateral recovery position (unless neck trauma suspected) • Maintain airway by chin lift or jaw thrust by the head tilt manoeuvre (insert airway after achieving position) • Stop bleeding by compression 	<p>Ask (accompanying persons) for:</p> <ul style="list-style-type: none"> • recent trauma • convulsions • diagnosis of epilepsy • hypertension • medication for diabetes • alcohol/ substance abuse • pesticide/ herbicide handling • known allergy • insect sting • snakebite 	<p>Measure:</p> <ul style="list-style-type: none"> • Blood glucose • Blood pressure • Temperature • Pulse 	<p>Check for:</p> <ul style="list-style-type: none"> • One-sided weakness and presence / absence of response to painful stimulus (e.g. pinch) • Breathing difficulty • Seizures/ convulsions • Advanced pregnancy, stiff neck • Swelling of lips, tongue or skin

Treat as follows:

If convulsions/seizure in pregnancy, give Magnesium Sulphate intravenous 4 g over 5-15 min; otherwise give diazepam 10mg rectally, refer to hospital (unless known epilepsy)

Suspected anaphylaxis with Systolic Blood Pressure <90 mmHg

- Place in supine position and insert airway
- Give adrenalin i/m (side of thigh) 0.01mg/kg, up to max dose of 0.5mg
- If no response, repeat adrenalin every 5 minutes
- Hydrocortisone i/v 100-300 mg

Blood Glucose <=2.8mmol/l

- If able to drink give one large table spoon 20-30g glucose mixed in water or 1 glass of fruit juice, honey or a sugar drink. If no response within 15 min, repeat
- If unconscious/unable to drink give 50ml 50% glucose i/v if feasible. Refer to hospital if no response within 10 minutes.

Urine ketones +++ and/or Blood Glucose >=18mmol/l

- Give rapid insulin 10 iu subcutaneous?
- Refer to hospital

Suspected herbicide/ pesticide poisoning/ Snakebite

If agent known, administer antidote if available before referring to hospital. May require gastric lavage to reduce absorption

Fever >38°C and/or stiff neck

Consider meningitis or cerebral malaria

Paralysis

Maintain airway, refer to hospital

Heart Failure

Definition: failure of the heart to pump blood forward at sufficient rate to meet body needs.

The patient may have symptoms due to:

- a) Low cardiac output:
 - Fatigue
 - Weakness
 - Exercise intolerance
 - Anorexia, or
- b) Congestion of the lungs:
 - Dyspnoea
 - Orthopnoea
 - Paroxysmal nocturnal dyspnoea or
- c) Congestion of peripheral tissues
 - Peripheral oedema (legs)
 - Right upper quadrant discomfort (liver).

Examination may show:

- Distension of the jugular veins in the neck
- Enlarged tender liver
- Pitting oedema of the legs

Pulmonary disease and congestive heart failure share many signs and symptoms and sometimes it is difficult to differentiate the two disease states.

Patients in heart failure should immediately be referred to hospital for further management. Frusemide (Lasix) 40mg and Digoxin 0.5mg may be given as single doses before referral. The patient should be propped up or seated to reduce the congestion of the lungs and decrease the breathlessness.

APPENDICES

Definitions

Random Blood Glucose (RBG)

This can be taken at any time. It does not take into account what the patient has been eating or drinking. It is therefore less sensitive than the other tests. However, it is the most convenient to perform.

Fasting Blood Glucose (FBG)

Before taking the blood test the patient must be fasted for at least 8 hours. The easiest way to do this is to arrange an appointment for the patient to have the blood test first thing in the morning. They should fast overnight and must not have anything to eat until after the test.

List of Acronyms

ACEI	Angiotensin Converting Enzyme Inhibitors
ARB	Angiotensin receptor blocker
BD	twice a day
BG	blood glucose
BP	blood pressure
BMI	body mass index
BP	blood pressure
ECG	Electrocardiogram
FBG	fasting blood glucose
FGT	fasting glucose tolerance
GTT	glucose tolerance test
HBA _{1c}	glycosylated haemoglobin
HBGM	home blood glucose monitoring
HDL	High Density Lipoprotein
IGT	impaired glucose tolerance test
LDL	Low density lipoprotein
MAX	maximum
OD	once a day
OHA	oral hypoglycaemic agents
QDS	four times a day
RBG	random blood glucose
SMBG	self-monitoring of blood glucose
TDS	three times a day
T2DM	Type 2 diabetes mellitus
T1DM	Type 1 diabetes mellitus
TIA	Transient Ischaemic attack
WHR	waist hip ratio

Drug contraindications

Drugs	Contraindications
Thiazide diuretic	Gout
B blockers	Asthma Chronic obstructive airways disease High degree Heart Block Bradycardia <50/min Raynaud's Mask symptoms of hypoglycaemia
Ace-inhibitor ACEi	Pregnancy Hyperkalaemia Bilateral renal artery stenosis
Ca-Channel blocker	Congestive heart failure Aortic stenosis
Aspirin	peptic ulcer (and caution if dyspepsia)
Metfomin	Renal damage, Hepatic disease, Cardiac failure, Chronic hypoxic lung disease Pregnancy or breast feeding
Sulphonylureas E.g. Glibenclamide	Pregnancy or breast feeding
Statins E.g. Atorvastatin	Myositis or myopathy
Thiazolidinediones	Heart failure or fractures

Major side effects – if present refer

Drugs	Major Side Effects
Thiazide diuretic	Muscle weakness (low potassium), increased serum cholesterol, impaired glucose tolerance/ diabetes impotence
B blockers	Worsening of congestive heart failure Difficulty breathing (in COPD and asthma) Worsening calf pain (peripheral arterial disease) Low blood sugar (hypoglycaemia) weight gain, depression, fatigue and impotence
Ace-inhibitor	Oedema (swelling) in the face, mouth, hands or feet Difficulty in swallowing or breathing Allergic reaction (sneezing, respiratory congestion, itching or skin rashes) Abdominal pain or swelling Fainting (syncope), drowsiness, weakness or fatigue Fast heartbeat Head ache Nausea or upset stomach, vomiting Diarrhea Abdominal cramps, pain or distention Joint and chest pain Foetal Abnormalities High Blood potassium
Ca-Channel blocker	Dizziness, headaches, Constipation Fluid retention Heartburn
Aspirin	Stomach pain heart burn nausea and vomiting gastrointestinal tract complications, including micro- bleeding and ulcers hemorrhagic stroke (small but very serious risk)

Drugs	Major Side Effects
Metfomin	aspirin-induced asthma Fast and deep breathing (Lactic acidosis) Weight loss Diarrhea
Sulphonylureas	Hypoglycemia weight gain water retention foetal abnormalities miscarriage
Statins	Muscle pain/rupture Muscle weakness Neuropathy Memory loss
Thiazolidinediones	Fluid retention congestive heart failure

Medications effect on Diabetes

Beta blockers	Mask symptoms of hypoglycaemia Worsening of dyslipidaemia Exacerbate peripheral vascular disease
Diuretics	large doses inhibit insulin release worsen dyslipidaemia
Alpha blockers	Make impotence worse
ACE-inhibitors	Lower glucose levels

**Reduction of cardiovascular burden through cost-effective integrated management of comprehensive cardiovascular risk*
World Health Organization Geneva 2002