National programme for control and management of Diabetes Type 2 at primary level

DIABETES MELLITUS TYPE 2

Diabetes Mellitus is rapidly emerging as a major public health problem. It is a chronic debilitating disease, but early detection and effective management may be associated with a normal lifespan and quality of life. It is a multi-faceted disorder and inflicts a tremendous economic burden on patients, families and health care providers. Diabetes Type 2 accounts for 80% to 90% of diabetes cases, the rest being young Type 1. The effects of urbanisation and an unhealthy lifestyle are important contributors to the rising prevalence.

Diabetes Type 2 is often associated with overweight and obesity (especially abdominal obesity), hypertension, atherosclerosis, other risk factors for cardiovascular disease associated with insulin resistance and is labelled as the metabolic syndrome.

MANAGEMENT OBJECTIVES

Make appropriate care available to every individual with Diabetes Type 2 to:

a) relieve symptoms
b) prevent acute metabolic and long-term complications with reduction of premature morbidity and mortality
c) promote education and self-care
d) control associated disorders
e) promote regular clinic attendance and compliance
f) improve quality of life and productivity
g) reduce the economic burden on the individual, family and community

TARGETS AT PRIMARY HEALTH CARE LEVEL

The targets at primary health care level should include the following:

a) diagnosis

b) education of health care professionals, their patients and families
c) prevention, detection and management of complications
d) ensuring the permanent availability of oral anti-diabetic agents, insulin, syringes, and other drugs
e) applying the principles of nutrition, physical activity and weight control
f) maintaining good patient records
g) self-monitoring of glycaemia control using blood glucose strips or, if unavailable, at least urine glucose strips
h) planning of pregnancies
i) appropriate referral to higher level of care
j) regular assessment of effectiveness of services for diabetic patients.

SCOPE OF THE POLICY GUIDELINES

Target population

Primary target:

- Persons with diabetes
- Health professionals

Secondary target:

- Families/friends of patients
- Persons $\geq$ 40 years

Diagnosis of Diabetes Mellitus Type 2

INITIAL VISIT		
HISTORY	PHYSICAL EXAM	BIO-CHEMISTRY
▪ Onset of symptoms ▪ Risk factors for Diabetes Mellitus* ▪ Relevant family history ▪ Relevant medical history ▪ Weight history ▪ Physical activity ▪ Drug history ▪ Complications ▪ Meal plans, eating habits ▪ Hypoglycaemic drugs if used ▪ Monitoring of metabolic control ▪ Hypoglycaemia or other acute symptoms ▪ Family/community support ▪ Current occupation	▪ Weight & height = BMI kg/m^2 and/or for waist circumference (cm) ▪ Visual acuity ▪ Oral cavity - dental caries - gum disease ▪ Cardiovascular - blood pressure ▪ Skin ▪ Feet - peripheral neuropathy pulses - injuries or infections - deformities ▪ Neurological, e.g. pain, numbness, weakness, reflexes ▪ Insulin injection sites (*if indicated*)	▪ Blood - glucose - Hb_1Ac** - lipids ** - creatinine if proteinurea is present ***(Where indicated)* ▪ Urine - glucose - ketones - protein *(To be confirmed by lab test if possible)*

* ***Risk factors:***
- Asymptomatic but a family history of Diabetes Mellitus
- Of Asian origin
- Women with previous gestational diabetes or high birth-weight infants (> 4 kg)
- Impaired Glucose Tolerance (IGT)/Impaired Fasting Glucose
- Hypertension
- Obesity
- Older persons (> 60 years)

I. Clinical features (symptoms)

***polyuria
general body weakness
repeated skin and genital infections
pruritus vulvae
poor wound healing

***polydipsia
lethargy
visual impairment (blurred vision)

*** creates a high index of suspicion of Diabetes Type 2

Many individuals, especially older persons with Diabetes Type 2, are however frequently asymptomatic.

II. Biomedical diagnosis

The diagnosis of diabetes must biochemically be confirmed as follows (the blood glucose concentrations are based on venous plasma samples or whole blood samples or capillary blood samples):

i) SYMPTOMS OF DIABETES + 1 RANDOM GLUCOSE > 11.1 MMOL/L

OR

ii) SYMPTOMS OF DIABETES + FASTING GLUCOSE:

	Plasma	Whole or Capillary Blood
Diabetes	> 7.1	> 6.1
Normal	< 7.1	< 6.1
IGT	6 - 7.1	5.5 - 6.1

OR

iii) IF THE RESULTS ARE EQUIVOCAL THE PATIENT REQUIRES A GLUCOSE TOLERANCE TEST WITH INGESTION OF 75 G OF ORAL GLUCOSE AFTER AN OVERNIGHT FAST

	2-HOUR POST 75 G LOAD	
	Plasma	Whole or Capillary Blood
Diabetes	> 11.1	> 10
Normal	< 8	< 7
IGT	5 - 11.1	7 - 10

IGT considered to be a 'risk factor' and not a type of diabetes

1. The diagnosis should ideally be made with the use of laboratory blood glucose estimations but

should this not be available, e.g. in rural areas, two abnormal finger prick (capillary) blood glucose results will be adequate.

For practical reasons, the following glucose values are recommended for diagnosis where:

Capillary/whole blood is used:
- Fasting value > 6 mmol/L
- Random value > 11 mmol/L

Plasma is used:
- Fasting value > 7 mmol/L
- Random value > 11 mmol/L

2. The presence of glycosuria is an indicator of diabetes, but is not diagnostic of diabetes. Diabetes should be confirmed by blood glucose estimations.

3. The presence of ketonuria and glycosuria warrants immediate blood glucose estimation and, if indicated, immediate institution of therapy or referral. The patient should be informed of the diagnosis and a therapeutic strategy initiated.

DIRECT REFERRALS TO REGIONAL/ SECONDARY LEVEL

- Ill-looking patients, especially in the presence of infections.
- Pregnancy with glycosuria/hyperglycaemia/ poor obstetric history. (Refer page 15)
- Diabetes Type 1 — young, thin, ketonuria. Insulin is indicated in all Diabetes Type 1 patients after initial emergency treatment as appropriate.
- Recurrent or persistent hyperglycaemia.
- Persistent infections, ulceration/gangrene of the foot.

- Proteinurea.
- Visual difficulties.
- Comatose patients (after initial emergency treatment).

TARGETS FOR CONTROL

Biochemical and anthropometric

(This is the ideal and may be difficult or impossible to achieve in certain patients)

Parameters		Optimal	Acceptable	Compromised *(need better control)*
Urine glucose		Negative	< 0.5% (+)	≥ 0.5% (++)
Blood glucose (Venous plasma samples and capillary blood samples, i.e. finger prick)				
Fasting		4 - 6	6 - 8	> 8
After meal (mmol/L)		5 - 8	8 - 10 never < 3.5	> 10
Body Mass Index (kg/m^2)	(males)	20 - 25	25 - 27	> 27
	(females)	19 - 24	24 - 26	> 26
Blood pressure (mmHg)		< 140/90	≥ 140/90 - < 160/95	> 160/95
Hb_1A c		normal	< 2% points above normal	> 2% points above normal
Total cholesterol (mmol/L)		< 5.2	≥ 5.2 < 6.5	≥ 6.5
HDL-cholesterol (mmol/L)		≥ 1.1	≥ 0.9 < 1.1	< 0.9
Fasting Triglycerides (mmol/L)		< 1.7	≥ 1.7 < 2.2	≥ 2.2

HbA_1c, total cholesterol and triglycerides where indicated.

Waist Circumference

	Increased	Substantially increased
Men	≥ 94 cm (37 inches)	≥ 102 cm (40 inches)
Women	≥ 80 cm (32 inches)	≥ 88 cm (35 inches)

(Not applicable to African population)

Self-care and self-monitoring is a priority. ***(Refer Annexure A)***

Patients with a fasting blood glucose of ≥ 16 mmol/L or random blood glucose of ≥ 15 mmol/L or who are severely symptomatic: introduce Step 2 immediately.

STEP 1

Lifestyle modification for three months, assessed every four weeks, for patients with typical symptoms and random blood glucose ≥ 11 mmol/L, but < 15, or a fasting blood glucose > 7 mmol/L, but < 16 mmol/L (venous plasma).
Refer: equivalent blood glucose concentrations (pages 4 and 5).

Lifestyle modification: ***(Refer Annexure A)***

- Weight control/weight loss for overweight and obese patients.
- Exercise programme.
- Stop smoking or avoid starting at all.
- Healthy diet:

  - Three meals a day (five small meals a day for people on insulin is ideal).
  - Reduce fat intake.
  - Increase fibre intake.
  - Alcohol intake limited according to doctor's advice (± two drinks per day or preferably excluded, especially in hypertensive diabetic patients).
  - Salt intake should be restricted. No added salt apart from minimum used in cooking.

  NB: The meal plan should be culturally acceptable and affordable. Take into consideration normal diet preferences, religious taboos, fasting periods, etc.

Routine monitoring:

- Assess blood glucose, urine glucose, weight and blood pressure response monthly.
- If targeted glycaemic control has not been achieved within three months with lifestyle modification, introduce Step 2.

STEP 2

This is initial treatment for patients with a fasting blood glucose $\geq$ 16 mmol/L or a random blood glucose $\geq$ 15.

- Continue with lifestyle modification programme.
- Initiate oral drug therapy.

Start with very low doses and increase slowly in small steps.

For overweight or obese patients:
Metformin (Biguanide)

Contra-indications include cardiovascular disease (heart failure), severe chronic respiratory disease, renal failure, or hepatic disease and pregnancy. Caution is required if prescribed in older persons > 60 years.

Adult starting dose:	850 mg/d, or 500 mg bd
increments:	850 mg or 500 mg at two-weekly intervals (ideally)
maximum dose:	3 000 mg/d

In thin or normal-weight patients:
Sulphonylurea, e.g. Glibenclamide or gliclazide

Sulphonylureas are contra-indicated in patients with advanced renal failure, hepatic dysfunction and in

pregnant women. Caution is required if prescribed in older persons in view of the frequency and severity of hypoglycaemia in this age group.

Tolbutamide (sulphonylurea) 500 mg bd is the drug of choice for older persons.

Adult		
starting dose	glibenclamide:	2.5 mg/d with breakfast
	or gliclazide:	40 mg/d with breakfast
increments	glibenclamide:	2.5 mg at two-weekly intervals
	or gliclazide:	40 mg at two-weekly intervals
maximum dose	glibenclamide:	15 mg/d or 7.5 mg bd
	or gliclazide:	320 mg/d or 160 mg bd
divided dose	recommended with	
	glibenclamide:	10 mg/d or more
	or gliclazide:	80 mg/d or more

Assess patients every two to four weeks till stabilised.

Do not combine two agents from the sulphonylurea group.

STEP 3

Combination oral therapy of metformin plus glibenclamide or gliclazide.
Prescribe second oral agent incrementally.
First check dietary and drug adherence.

Combination oral therapy is indicated if the

glycaemic target on maximal monotherapy is not achieved after three months.

STEP 4

Insulin is indicated with failed combination therapy (Step 1 and 2 or Step 1 and 3) or with severe symptoms or infections. Insulin therapy should always be instituted under the direct or indirect supervision (can be telephonically) of a doctor. In the latter instance, review by a doctor should be undertaken as soon as possible, preferably within one week.
Refer Annexure C (Algorithm for the Management of Diabetes Type 2)

Initiation of insulin therapy

In normal-weight or moderately overweight (BMI 27 - 30) patients:

- Bed-time intermediate-acting insulin (supplementation):
  - Start with a dosage of 0.2 U/kg/d, increasing by four units every week until adequate control of fasting blood glucose is achieved (up to a maximum dose of 0.6 U/kg/d).
  - This could be given alone or in combination with the currently prescribed oral agent regimen as follows:
    - Maintain same oral doses as before,
    - or reduce doses by half by omitting evening dose,
    - or stop all oral antidiabetic medication.
- Twice-daily biphasic insulin mixtures 30/70 (substitution) :
  - This should be given in a twice-daily regimen using $^{2}/_{3}$ of the insulin dose in the morning before breakfast and $^{1}/_{3}$ in the evening before supper.

- Starting dose of 0.2 U/kg/d increasing up to a max of 0.6 U/kg/d.
- Stop oral antidiabetic medication in all patients.

If satisfactory glycaemic control is not achieved by such regimens, the patient should be referred.

Grossly overweight patients (BMI > 30) who are poorly controlled on diet and oral agents should be referred for review and consideration for further therapy.

The insulin-treated patient, together with family members or friends, must be educated with regard to the following:

- Lifestyle modification.
- Meal frequency and recognition and treatment of hypoglycaemia.
- Insulin preparations.
- Drawing-up of insulin.
- Insulin injection.
- Injection sites.
- Insulin storage.
- Glucose monitoring.
- Hygiene principles, foot care.

ALL FOLLOW-UP VISITS AT PRIMARY LEVEL

- Evaluate coping with diabetes and adherence
- Review management plan
- Deal with pertinent problems, e.g. signs, symptoms and complications
- Physical examination as for initial visit and glycaemia control
- Diabetes education (Annexure A)

Schedule visit every three months when controlled.
Refer to secondary or tertiary level/specialist if progress is unsatisfactory.

ANNUAL REFERRAL TO INSTITUTION EQUIPPED FOR:

- Physical examination on initial visit.

- Biochemical laboratory tests
  - Urine: glucose, ketones, protein
  - Blood: Venous plasma glucose, Hb_1Ac, total cholesterol and triglycerides.

- Detailed screen for early complications, e.g. fundoscopy (through dilated pupils), cataracts, foot problems, other pathology.

Management

- Re-evaluate therapy, dietary programme and self-monitoring techniques and adapt if necessary.

- Continue teaching self-care skills and monitoring.

URGENT REFERRAL CRITERIA TO NEAREST HOSPITAL/ COMMUNITY HEALTH CENTRE

- Metabolic
  - Dehydration and hypotension
  - Nausea, vomiting and abdominal pain
  - Stupor, confusion, pre-coma
  - Heavy ketonuria (> 2+)
  - Significant hyperglycaemia (> 20 mmol/L) in the presence of symptoms
  - Hypoglycaemic coma unresponsive to intravenous glucose therapy.

- Severe complications
  - Sepsis, including gangrene
  - Acute deterioration in vision
  - Serious infections, e.g. TB, urinary tract infections, boils and pneumonia

Start sodium chloride 0.9% infusion before transfer of ill patients. (No insulin during transportation.)

Referral-back communication to primary level is of utmost importance.

Causes and prevention

- At the initiation of treatment, the insulin or sulphonylureas should be started with a small dose, gradually increased with careful adjustment.
- Decreasing, delaying or omitting meals should be avoided. Ideally, people should eat stable amounts of foods, have regular times for meals, and should decrease the dose of drugs if they cannot eat the usual amount of food for any reason.
- Extra carbohydrate should be taken before an unusual increase of physical exercise.
- Excessive alcohol intake, particularly without food, should be avoided.
- Make arrangements to provide a Medic Alert disc inscribed: *'Diabetes - give sugar if confused'*.

Signs and symptoms of hypoglycaemia:

- Sweating.
- Palpitations.
- Nervousness.
- Hunger.
- Faintness, weakness.
- Irritability.
- Headache.
- Visual disturbance.
- Marked personality changes, confusion, coma, convulsions.

Patients who are aware of the signs and symptoms of hypoglycaemia will be able to relieve the condition early by taking glucose or 2 - 4 teaspoonfuls of sugar with a little water or milk. If necessary, this step should be repeated within 10 - 15 minutes. Thereafter, slowly digestible carbohydrates (e.g. bread) and protein (e.g. milk) should be taken for prolonged restoration of blood glucose.

It should be remembered that after some years of illness the characteristic warning symptoms may disappear and the first symptoms the patient presents with may be due to neuroglycopenia such as irritability, headache, impaired concentration, confusion, convulsions, transient paresis and ultimately coma.

In the unconscious hypoglycaemic patient, the treatment of choice is the immediate IV injection of 20 - 25 ml of 20 - 50% dextrose solution, preferably after hypoglycaemia has been confirmed. If not confirmed, the injection of dextrose should not be delayed by more than two minutes. It should be slowly injected over two minutes into a large vein and followed by an infusion of 5% dextrose or half saline (0.45% NaCl) in 5% dextrose to minimise the risk of venous thrombosis. This injection should be repeated as often as is necessary, until the patient is co-operative enough to eat or drink. 50 ml of 50% dextrose IV is about the maximum necessary to raise the blood glucose. Family members or friends and the patient should be educated regarding the symptoms and signs of hypoglycaemia and the management thereof.

Monitor glucose levels for at least 12 - 24 hours.

Patients should remain under observation.

Co-management of different diagnosed diseases/risk factors is important.

Family planning

Family planning is of paramount importance in young women with diabetes. Conception in poorly controlled diabetic women is associated with congenital anomalies. Intensive education on contraception should be offered to all adolescent and adult women in the child-bearing age group who have diabetes. Pregnancies should be planned when optimal glycaemic control has been achieved and maintained for at least three months prior to conception.

Contraception

Either the combined low-dose oestrogen-progesterone contraceptive tablet or injectable progestogen is the ideal method where the family is not complete. Intra-uterine copper contraceptive devices should ideally not be used in view of concerns about possible infection. Where the family is complete, tubal ligation or vasectomy is the best method.

Screening

Although many women are known to have Diabetes Type 2 and attend diabetic clinics, an equal number are likely to have unrecognised diabetes, while others will develop diabetes during pregnancy due to the pregnancy-induced changes in carbohydrate metabolism. In both the latter cases, if the diabetes is discovered for the first time in the index pregnancy, it is referred to as gestational diabetes. Approximately 30% of women with gestational diabetes will develop permanent diabetes in later life. It is therefore important to identify gestational diabetic patients as high risk for subsequent development of permanent diabetes.

Mechanism of screening

Pregnant women with the following risk factors should have a glucose tolerance test (GTT) at 28 weeks' gestation and should be referred to Level 2 hospitals:

- Repeated glycosuria.
- Previous gestational diabetes.
- A family history of diabetes.
- Obstetric history of stillbirths of unknown origin, previous congenital anomalies and suspicion of polyhydramnios in the present pregnancy.
- High birth-weight infant > 4 kg.
- Hypertension.
- Obesity (BMI > 30).

Practical application at any antenatal clinic

- Routine urinanalysis should be done at every antenatal visit and, if glucose is present, a blood glucose measurement should be done.
- All women should have at least a blood glucose strip estimation done at 28 weeks' gestational age.
- In addition, women with the aforementioned potential diabetic risk factors should have a fasting and/or random blood glucose at booking.
  The normal fasting blood glucose value (finger prick) in pregnancy is < 5.5 mmol/L. If the fasting blood glucose value (finger prick) is $\geq$ 6 mmol/L, a full GTT is indicated.

The GTT in pregnancy

Give 75 g of oral glucose after an overnight fast. Gestational diabetes is diagnosed when:

i) a 2-hour post-glucose load blood sample (venous plasma) has a glucose value of $\geq$ 8 mmol/L.

ii) a fasting blood glucose value (finger prick) is > 5.5 mmol/L.

REFER FOR SPECIALIST TREATMENT WHEN GESTATIONAL DIABETES IS DIAGNOSED.

DIABETES TYPE 2 AND RAISED BLOOD PRESSURE

Lifestyle modification only is often inadequate for reducing blood pressure to the acceptable range. Antihypertensive medication is usually indicated. ACE inhibitors lower blood pressure effectively and are thought to exert additional renoprotective effects in diabetes which are of particular value if renal disease coexists with hypertension. In black patients, ACE inhibitors should be used in combination with diuretics. Calcium channel blockers are metabolically 'neutral' and may be particularly useful in black patients.

The recommended treatment for uncomplicated mild to moderate hypertensive (systolic $\leq$140 mmHg and/ or diastolic $\leq$ 90 mmHg) patients with Diabetes Type 2 at PHC level is:

- Hydrochlorothiazide (HCT) 12.5 mg daily. Check blood pressure after four and eight weeks. If target systolic < 140 mmHg and/or diastolic < 90 mmHg is not achieved, increase HCT to 25 mg daily and check BP after four and eight weeks. If still no adequate response, add ACE inhibitor once a day and, if control is not achieved, refer as soon as possible to next level.

ANNEXURE A

DIABETES EDUCATION

Diabetes is a chronic disorder characterised by both acute (hyperglycaemia and hypoglycaemia) and long-term complications. The acute complications can be prevented or attenuated by the patient's alertness to the warning signs that problems are developing, institution of self-care and self-referral. The same applies to certain of the chronic complications, e.g. foot injury or infection.

Diabetes is a self-managed condition and as such it is essential for patients to acquire the relevant knowledge, skills and attitudes needed for successful diabetes management. Diabetes education includes self-care education focusing on improving the patient's *problem-solving ability* as well as education of the family and the community. Diabetes educators should include all health professionals, lay health workers, traditional healers and complementary health professionals. They must receive suitable education in diabetes care, as well as in education and counselling theory and practice.

Patient education is an interactive, problem-solving process, which combines education and counselling skills to empower the patient to accept the practise of self-management on a daily basis. The education of patient, friend and/or family should include:

(a) Knowledge and management

- diagnosis, explanation and recognition of diabetes symptoms
- glycaemia targets
- blood glucose and urine monitoring and appropriate action in response to abnormal findings:

Urine glucose self-monitoring

The basis for urine glucose measurements is the fact that glycosuria is roughly correlated with

hyperglycaemia. Urine testing is painless, less expensive and easier to teach than blood glucose measurements. The general aim is to keep the urine glucose-free. It is suitable:

- for patients with stable metabolic control
- for patients on diet or diet and oral hypoglycaemic agents
- when limited resources of health care facilities preclude the dispensing of blood glucose test strips
- if the patient's social situation, medical condition or motivation would discourage efforts at achieving near normo-glycaemia.

However, urine glucose testing has certain drawbacks:

- It does not give warning of impending hypoglycaemia.
- It is not useful in certain situations such as when the renal threshold is elevated (as in the elderly) or low (as in pregnancy).
- It reflects an average level of blood glucose during the interval since the last voiding and not the level at the time of the test.

Urine ketone determinations remain an important part of monitoring of diabetic control. Urine must be tested for ketones during acute illness or stress, when blood glucose levels are consistently elevated, during pregnancy, or when any symptoms of keto-acidosis (e.g. nausea, vomiting, abdominal pain) are present.

Blood glucose self-monitoring

Blood glucose self-monitoring (BGSM) is a means of achieving a goal rather than a goal in itself. When properly performed, it permits people with diabetes to determine their blood

glucose levels. However, the value of BGSM is limited unless it is used as part of an integrated education and treatment programme. The goals of treatment and the reason for performing BGSM must be clearly defined.

The indications and frequency for monitoring will vary considerably, depending on the clinical situation of each patient and the purpose for which BGSM is being used. In the majority of patients with Type 2 diabetes still able to secrete sustainable amounts of insulin, it may be used to assess temporal patterns (e.g. does glucose concentration rise/fall during the day or during the night?) so that pharmacological treatment can be appropriately increased or decreased.

Blood glucose testing is preferable to urine testing for metabolic control. It is desirable for certain patients on oral hypoglycaemic agents and is strongly recommended for all patients on insulin.

People with diabetes (or their designated care providers such as relatives) must be capable of learning the proper use of BGSM and be instructed by trained health care workers. They should use the data to:

- self-adjust = diet, exercise, pharmacological therapy
- identify and properly treat hyperglycaemia and hypoglycaemia
- improve decision-making and problem-solving.

The effective use of BGSM in appropriate patients encourages them to assume a greater responsibility for control, thereby improving confidence and self-management.

Self-monitoring technique should be checked once or twice per year by the health care team.

(b) Survival skills

- Self-monitoring and recording.
- Recognition of hyperglycaemia symptoms:
  - Extreme thirst and dry mucous membranes and skin
  - Fatigue
  - Nausea and vomiting
  - Acetone odour (fruity) of breath (ketonuria)
- Symptoms of/and prevention of hypoglycaemia (Refer page 13).
- Treatment of hypoglycaemia.

Urgent self-referral in the presence of any of the above.

(c) Health promotion

- Good dietary management (overweight patients — aim for 5 to 10 kg weight loss).
- General hygiene.
- Dental care.
- Physical activity: walking that causes sweating for 20 — 30 minutes at least three to four times a week.
- Family planning.
- Contraception and progestational counselling.
- Prevention of foot pathology (Refer Annexure B).
- Awareness of complications.
- Self-pollution, e.g. tobacco, alcohol and drugs.

(d) Counselling

- Disease acceptance/lifelong therapy.

- Reassurance of continuity of care.
- Value of compliance.
- Dependence and independence conflict.
- Introduction to self-care:
  - Medic Alert bracelet.
  - Carrying simple carbohydrates (sweets). for treatment of hypoglycaemia.
  - Involving the family and others.
  - Regular home monitoring.
  - Weight control.
  - Reading food package labels.
  - Keeping social contact/local interest groups.
  - Eating out.

ANNEXURE B

PREVENTION OF FOOT PATHOLOGY

Many foot problems can be prevented by proper care of the feet. Adherence to good foot principles in early life can prevent major problems developing in later years. Certain foot problems can be reduced by up to 80% with proper foot care education and management. Advice should include the following:

- Have the feet professionally examined at least once a year.
- Wash the feet daily, dry them well and keep them dry. Wear clean socks or stockings every day.
- Inspect the feet at least once a week, checking for redness, blisters, cuts or scratches, cracks between the toes, discolourations or other changes. Keep an eye on minor abrasions, keep them clean. If any swelling or redness is noticed around the area, report these immediately to the nearest health care professional or clinic.
- Encourage to report every injury.
- Prevent unnecessary cuts and irritations. *Do not* wear rundown shoes or worn-out stockings if possible. Persons with diabetes should never walk barefoot. *Do not* cut down the corners of your toenails or dig around the nail with a sharp instrument.
- Avoid doing things which will restrict the blood-flow to the feet, such as smoking. Never wear garters or socks with tight elastic tops.
- Cut the nails straight across. Never cut the nails too short as this may cause ingrown toenails. After cutting, file the nails downwards.
- Wear shoes that fit at the widest part of the foot and suit the activity. The shoe should follow the natural outline of the foot and be snug but not

tight. In general, shoes should support the heel and keep the foot in position. Have adequate room beyond your longest toe when you stand. The box should be round and high to allow space for the toes. The shoe upper should be soft and flexible. The lining should be smooth and free of ridges. Until you are used to new shoes, wear them for short periods and gradually lengthen the wearing time.

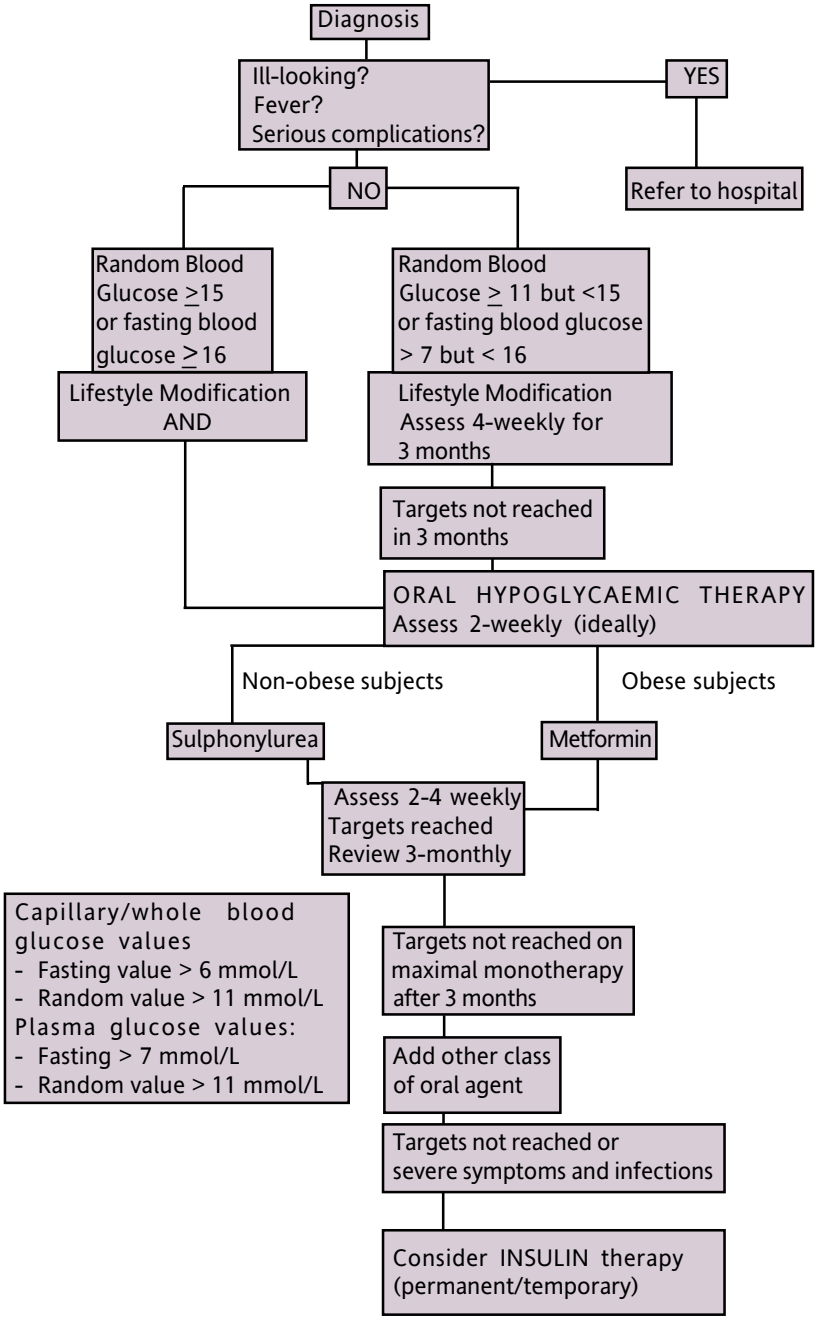
- Do not cut corns or calluses yourself or use corn plasters or other remedies. These preparations are acidic and often lead to ulcers. Consult a health care professional. Corns and calluses are an indication of malfunction.

- Control the body mass.

If any injury does not respond quickly to treatment, consult a health professional.

ANNEXURE C

ALGORITHM FOR THE MANAGEMENT OF DIABETES TYPE 2
Primary Health Care Level



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