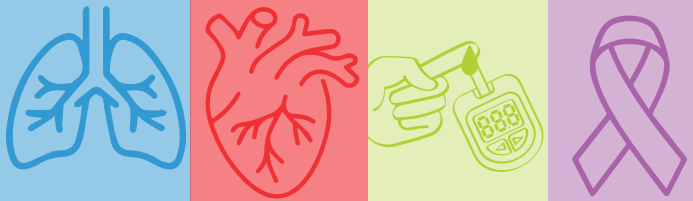
Ministry of Health

REPUBLIC OF KENYA

PROTOCOLS FOR MANAGEMENT OF

SELECTED NON-COMMUNICABLE DISEASES

AT PRIMARY CARE SETTING



DIVISION OF CANCER AND NONCOMMUNICABLE DISEASES
MINISTRY OF HEALTH, KENYA

Foreword

The rising burden of non-communicable diseases (NCDs) in Kenya continues to exert a huge socio-economic toll to households and communities as well as strain health systems. Unfortunately, the impact of NCDs will continue to increase, owing to demographic and epidemiological transition in Kenya, as well as other ongoing environmental and social changes, including climate change and urbanization. Therefore, as a country, we need to adequately plan for this future disease burden. NCDs are at the center of current health systems strengthening efforts in Kenya.

Since NCDs are chronic in nature and majority require care along the entire life course, primary health care (PHC) is the only feasible approach for effective NCD care in any population. PHC is also the vehicle for delivery of Universal Health Coverage (UHC), whose tenets of equity, quality, access, and financial protection are extremely relevant for NCDs. PHC workers (PHCWs) in the country frequently lack clear, accessible, and easy to use guidance algorithms and job aids, to enable them suspect, screen, diagnose, manage and/or appropriately refer patients with NCDs. The result is overwhelming of secondary and tertiary levels with patients suffering from NCD complications, that could have been averted if care was instituted on time.

This NCD protocols document contains clear guidance and decision-making support algorithms for priority NCDs, including

hypertension, diabetes, cancer screening (breast, cervical, colorectal, and prostate), sickle cell disease, asthma, and mental health. The protocols are intended to be facilitative, enabling, and foundational, providing a firm basis for appropriate action following the finding of presence or absence of disease. The protocols are derived from the respective clinical guideline documents developed by the Ministry of Health together with other stakeholders. The protocols are aimed at doctors, clinical officers, nurses, and other health workers working at outpatient department or wellness clinics at all levels. It is the expectation of the Ministry that these protocols will serve the users well as a guide for NCD management, especially at the PHC level.

On behalf of the Ministry of Health, I would like to thank the various Technical Working Groups, experts and editors who contributed to the development of the protocols.

Dr Patrick Amoth, EBS
Director General
Ministry of Health

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List of Abbreviations

ACEI:	Angiotensin converting enzyme inhibitors
ACS:	Acute chest syndrome
AIDS:	Acquired immunodeficiency syndrome
BD/BID:	Twice a day
BMI:	Body mass index
BS:	Blood slide
BSE:	Breast self-examination
Bwt:	Body weight
CBC:	Complete blood count
CBE:	Clinical Breast Examination
CBG:	Capillary blood glucose
CCB:	Calcium channel blockers
CRT:	Capillary refill time
CT:	Computerized tomography
CVD:	Cardiovascular disease
DBP:	Diastolic blood pressure
DM:	Diabetes Mellitus
DPP4:	Dipeptidyl Peptidase IV (DPP IV) Inhibitors
DRE:	Digital Rectal Examination
ECG:	Electrocardiogram
ECHO:	Echo-cardiogram
FIT:	Faecal immunochemical test
FOBT:	Faecal occult blood test

FPG:	Fasting plasma glucose
GE:	Gastroenteritis
HbA1C:	Glycated hemoglobin
HIV:	Human Immunodeficiency virus
HPV:	Human Papilloma virus
IFG:	Impaired fasting glucose
IM:	Intramuscular
KCL:	Potassium chloride
LEEP:	Laser electrosurgical excision procedure
LFT:	Liver function tests
MRI:	Magnetic resonance imaging
NPH:	Neutral Protamine Hagedorn
NPO:	Nil per oral
OD:	Once a day
ORS:	Oral rehydration solution
PO:	Per oral
PSA:	Prostatic Specific Antigen
QDS:	Four times a day
SBP:	Systolic blood pressure
SC:	Subcutaneous
SCD:	Sickle Cell Disease
SES:	Socioeconomic status
SGLT2:	Sodium-glucose cotransporter-2
TFT:	Thyroid function tests
TID/TDS:	Three times a day

TRUS:	Trans-rectal ultrasound
TZD:	Thiazolidines
U+E:	urea and electrolytes
VIA:	Visual inspection with acetic acid
VILI:	Visual inspection with lugol's iodine
WHO:	World Health Organization
WHR:	Waist-Hip ratio

1. CARDIOVASCULAR DISEASE (CVD) RISK ASSESSMENT

Eligibility

- Age >40 years
- Smokers
- Obesity/ Overweight
- Known to have HTN and/or DM.
- History of premature CVD in first-degree relative
- History of DM or kidney disease in
- First-degree relative
- Waist circumference (≥90cm women, ≥100cm men)

Select chart
Is cholesterol level available?

Yes (Go to non-laboratory-based chart, page 5)

STEP 1: Select the section of the chart as relevant for people with or without diabetes
STEP 2: Select the table for men or women, as appropriate
STEP 3: Select the smoker or non-smoker column
STEP 4: Select the age group
STEP 5: Within the selected box find the cell where the person's systolic blood pressure and total blood cholesterol intersect
STEP 6: The colour of the cell indicates the 10-year risk of fatal or non-fatal CVD event. The value within the cell is risk percentage. Colour coding is based on the grouping.
STEP 7: Record the CVD risk percentage in person's chart.
STEP 8: Counsel, treat and refer according to risk level

Green	<5%
Yellow	5% to <10%
Orange	10% to <20%
Red	20% to <30
Deep red	≥50%

No (Go to the laboratory-based chart, page 3)

STEP 1: Select the table for men or women, as appropriate.
STEP 2: Select smoker or non-smoker column
STEP 3: Select age-group.
STEP 4: Within the selected box, find the call where the person's systolic blood pressure and body mass index (BMI) intersect.
STEP 5: The colour of the cell indicates the 10-year risk of a fatal or non-fatal CVD event. The value within the cell is the risk percentage. Colour codingis based on the grouping.
STEP 6: Record CVD risk percentage in person's chart.
STEP 7: Counsel, treat and refer according to risk level.

Green	<5%
Yellow	5% to <10%
Orange	10% to <20%
Red	20% to <30
Deep red	≥50%

Management of Total 10-year risk of fatal or non-fatal CVD event		
<10 % (Low risk)	**Risk 10% to <20% (Moderate Risk)**	**>20% (High and very high risk)**
Counsel on diet, physical activity, smoking cessation and avoiding harmful used of alcohol		
If risk is <5%, follow up in 12 months If risk is 5% to < 10% follow up every 3 months until targets are met, then 6-9 months	Persistent BP >140/90 consider drugs Follow up every 3-6 months	Persistent BP ≥ 130/80 consider drugs Give a statin Follow up every 3 months. If there is no reduction in CVD risk after 6 months of follow-up, refer.

Important practical points

- For management of hypertension refer to page 6
- For management of diabetes refer to page 31
- Consider drug treatment for the following:
  - All patients with established DM, CVD, and renal disease. If stable, continue with medication already prescribed. They should be considered as having risk >20%.
  - Patients with albuminuria, retinopathy, left ventricular hypertrophy
  - All individuals with persistently raised BP ≥160/100mg
  - All individuals with total cholesterol at or above 8 mmol/L
- Follow-up visits:
  - Ask about: New symptoms, adherence to advice on tobacco and alcohol use, physical activity, healthy diets, medication
  - Assess (physical exam)
  - Estimate cardiovascular risk
  - Counsel and treat as shown in the protocol

WHO Cardiovascular disease risk laboratory-based charts

Eastern Sub-Saharan Africa

Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Somalia, Uganda, United Republic of Tanzania, Zambia

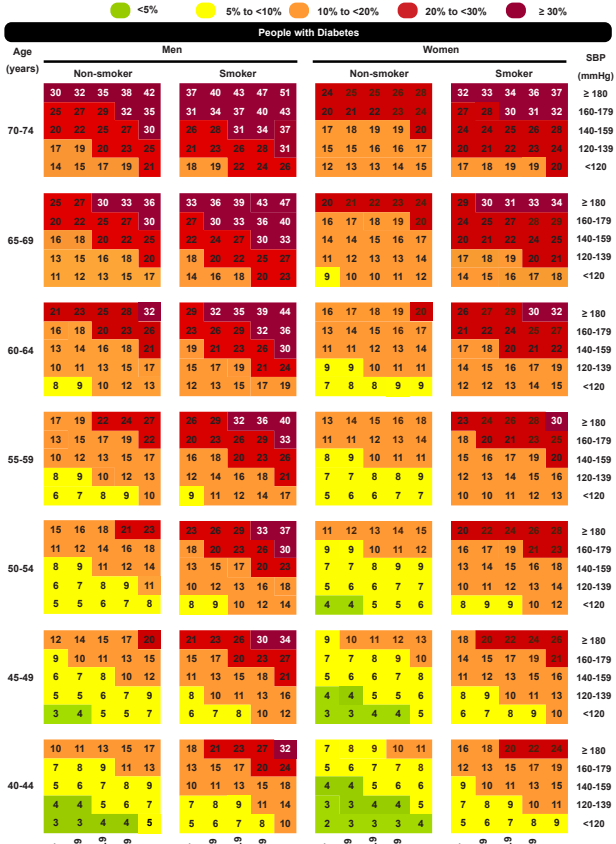
People without Diabetes

Age (years)	Men								Women								SBP (mmHg)
	Non-smoker					Smoker			Non-smoker					Smoker			
70-74	22	24	27	29	32	28	30	33	36	39	16	17	17	18	19	22	23	24	25	26	≥ 180
	18	20	22	24	26	23	25	28	30	33	14	14	15	15	16	19	20	20	21	22	160-179
	15	17	18	20	22	19	21	23	25	28	12	12	13	13	14	16	17	17	18	19	140-159
	12	14	15	16	18	16	17	19	21	23	10	10	11	11	12	14	14	15	15	16	120-139
	10	11	12	14	15	13	14	16	17	19	8	9	9	9	10	12	12	12	13	14	<120
65-69	16	19	21	23	26	23	26	28	31	34	12	13	14	14	15	19	19	20	21	23	≥ 180
	14	16	17	19	21	19	21	23	25	28	10	11	11	12	13	15	16	17	18	19	160-179
	11	12	14	15	17	15	17	19	21	23	9	9	9	10	10	13	13	14	15	16	140-159
	9	10	11	12	14	12	14	15	17	19	7	7	8	8	9	11	11	12	12	13	120-139
	7	8	9	10	11	10	11	12	14	15	6	6	6	7	7	9	9	10	10	11	<120
60-64	14	15	17	19	21	19	21	24	27	30	10	10	11	11	12	15	16	17	18	20	≥ 180
	11	12	13	15	17	15	17	19	21	24	8	8	9	9	10	13	13	14	15	16	160-179
	8	9	10	12	13	12	13	15	17	19	6	7	7	8	8	10	11	12	12	13	140-159
	7	7	8	9	10	9	11	12	14	15	5	5	6	6	7	8	9	9	10	11	120-139
	5	6	6	7	8	7	8	9	11	12	4	4	5	5	5	7	7	8	8	9	<120
55-59	11	12	13	15	17	16	18	20	23	26	7	8	8	9	10	13	14	15	16	17	≥ 180
	8	9	10	11	13	12	14	16	18	20	6	6	7	7	8	10	11	12	13	14	160-179
	6	7	8	9	10	10	11	12	14	16	5	5	5	6	6	8	9	9	10	11	140-159
	5	5	6	7	8	7	8	9	11	13	4	4	4	5	5	6	7	8	8	9	120-139
	4	4	5	5	6	6	6	7	8	10	3	3	3	4	4	5	6	6	7	7	<120
50-54	8	9	10	12	13	13	15	17	19	22	6	6	7	7	8	11	12	12	14	15	≥ 180
	6	7	8	9	10	10	11	13	15	17	4	5	5	6	6	8	9	10	11	12	160-179
	5	5	6	7	8	8	9	10	11	13	3	4	4	4	5	6	7	8	8	9	140-159
	3	4	4	5	6	6	6	7	9	10	3	3	3	3	4	5	5	6	7	7	120-139
	3	3	3	4	5	4	5	6	7	8	2	2	2	3	3	4	4	5	5	6	<120
45-49	6	7	8	9	11	11	12	14	16	19	4	5	5	6	6	9	10	11	12	13	≥ 180
	5	5	6	7	8	8	9	11	12	14	3	4	4	4	5	7	7	8	9	10	160-179
	3	4	4	5	6	6	7	8	9	11	2	3	3	3	4	5	6	6	7	8	140-159
	2	3	3	4	4	4	5	6	7	8	2	2	2	2	3	4	4	5	5	6	120-139
	2	2	2	3	3	3	4	4	5	6	1	2	2	2	2	3	3	4	4	5	<120
40-44	5	6	6	7	9	9	10	12	14	16	3	4	4	4	5	7	8	9	10	11	≥ 180
	3	4	4	5	6	6	7	9	10	12	2	3	3	3	4	5	6	7	8	8	160-179
	2	3	3	4	5	5	5	6	7	9	2	2	2	2	3	4	5	5	6	6	140-159
	2	2	2	3	3	3	4	5	5	7	1	1	2	2	2	3	3	4	4	5	120-139
	1	1	2	2	2	2	3	3	4	5	1	1	1	1	2	2	3	3	3	4	<120
	<4	4-4.9	5-5.9	6-6.9	≥7	<4	4-4.9	5-5.9	6-6.9	≥7	<4	4-4.9	5-5.9	6-6.9	≥7	<4	4-4.9	5-5.9	6-6.9	≥7	

Total Cholesterol mmol/l

Eastern Sub-Saharan Africa

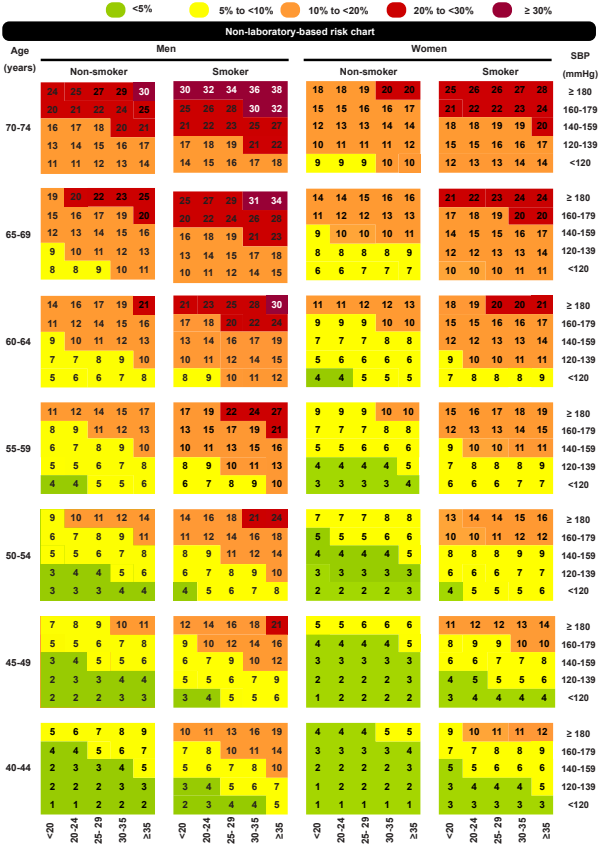
Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Somalia, Uganda, United Republic of Tanzania, Zambia



WHO Cardiovascular disease risk non-laboratory-based charts

Eastern Sub-Saharan Africa

Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Somalia, Uganda, United Republic of Tanzania, Zambia



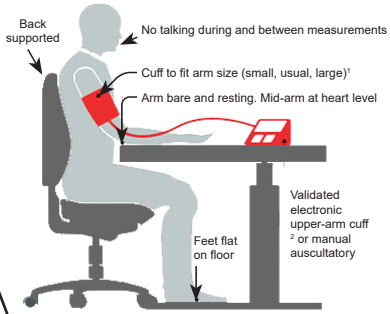
2. HYPERTENSION

- Quiet room, comfortable temperature.
- No smoking coffee, exercise for 30 min
- Empty bladder
- Relax for 3-5 min
- Take 3 measurements at 1 min intervals
- Use the average of the last 2 measurements.

HYPERTENSION SCREENING

Age ≥18 years

Measure BP - take 3 readings and use an average of the last two readings.



[1] For manual auscultatory devices the inflatable bladder of the cuff must cover 75-100% of the individual's arm circumference.

[2] For electronic devices use cuffs according to devices lists at www.stridebp.org

SBP <140mmHg and DBP <90mmHg

Lifestyle advice (Healthy diet, physical activity, alcohol, and tobacco use avoidance)

Repeat BP Annually

SBP ≥ 140mmH and/or DBP ≥ 90mmHg

SBP ≥140 - 179mmHg and/or DBP ≥ 90 - 109 mmHg

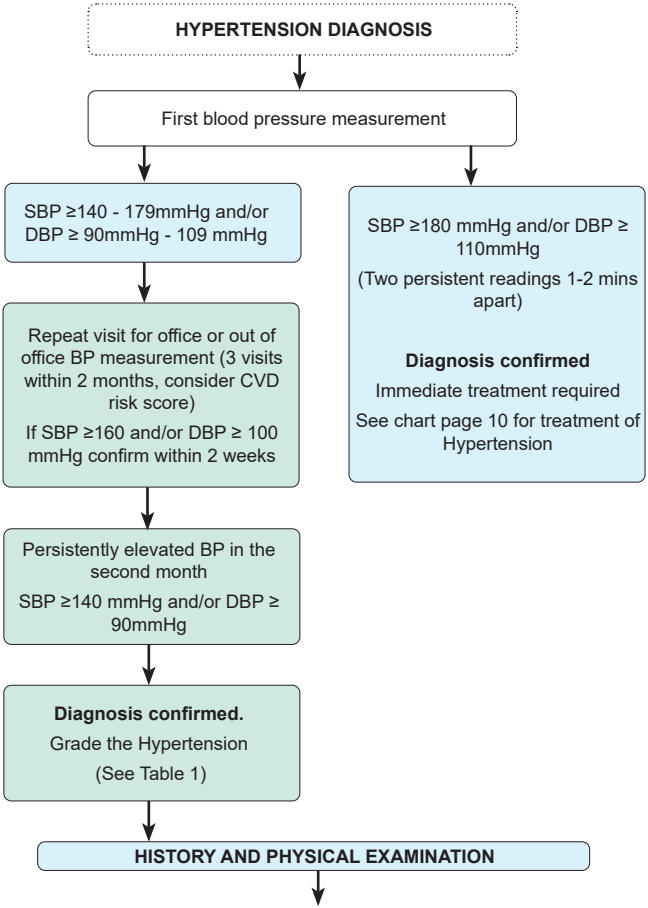
Refer appropriately for confirmation of diagnosis and management

See Chart for Hypertension Diagnosis (page 7)

SBP ≥ 180mg and/or ≥ DBP 110mmHg

Refer appropriately for immediate treatment

See Chart for treatment of Hypertension (page 10)


HYPERTENSION DIAGNOSIS
First blood pressure measurement
SBP ≥140 - 179mmHg and/or DBP ≥ 90mmHg - 109 mmHg
Repeat visit for office or out of office BP measurement (3 visits within 2 months, consider CVD risk score)
If SBP ≥160 and/or DBP ≥ 100 mmHg confirm within 2 weeks
Persistently elevated BP in the second month
SBP ≥140 mmHg and/or DBP ≥ 90mmHg
Diagnosis confirmed.
Grade the Hypertension
(See Table 1)
SBP ≥180 mmHg and/or DBP ≥ 110mmHg
(Two persistent readings 1-2 mins apart)
Diagnosis confirmed
Immediate treatment required
See chart page 10 for treatment of Hypertension
HISTORY AND PHYSICAL EXAMINATION

HISTORY AND PHYSICAL EXAMINATION

Examination	Rationale
Weight and height (BMI)	Set targets for weight loss, choice of drugs.
Signs of heart failure (distended jugular veins, rales on chest auscultation, enlarged liver and peripheral edema)	Diagnose metabolic syndrome and T2DM risk.
Neurological examination	Choice of medications
Peripheral Pulses	Signs of previous stroke and treatment selection

BASELINE INVESTIGATIONS

Investigation	Rationale
Urinalysis	Evidence of kidney disease or diabetes
Blood glucose	Diagnose of diabetes.
Full blood count	Anaemia may indicate CKD Increased white blood cells may indicate infections
Creatinine, **Electrolytes**	Diagnosis of renal disease. Electrolytes imbalance may suggest renal or hormonal anomaly
Lipid profile	Dyslipdaemia is a cardiovascular disease risk factor
Electrocardiography (ECG)	Identify cardiac anomalies such as enlargement , infraction, ventricular dysfunction etc.

Note: Additional tests may be ordered as needed, at the discretion of the health care team.

Check for possible secondary hypertension (Table 2): refer to a physician (See table 2)

Initiate Treatment
See Chart (page 10) **on Hypertension Treatment**

Table 1: Grading of Hypertension

Category	Systolic (mmHg)		Diastolic (mmHg)
Optimal	<120	and	<80
Normal	120-129	and/or	80-84
High normal	130-139	and/or	85-89
Grade 1 hypertension	140-159	and/or	90-99
Grade 2 hypertension	160-179	and/or	100-109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension	≥140	and	<90

BP= blood pressure, SBP= systolic blood pressure

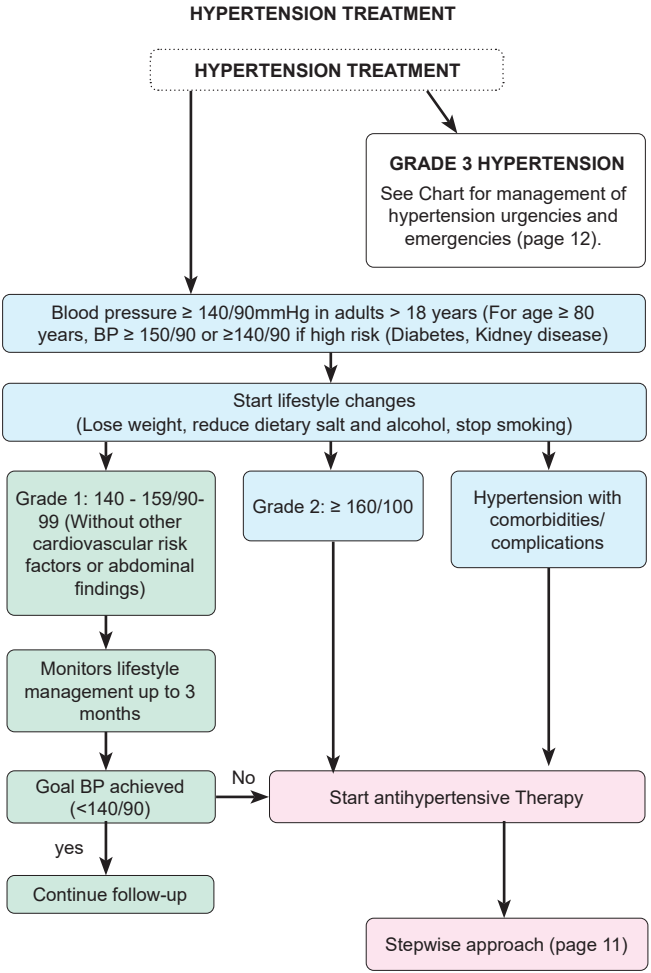
[a]BP category is defined according to seated clinic BP and by the highest level of BP, whether systolic or diastolic.

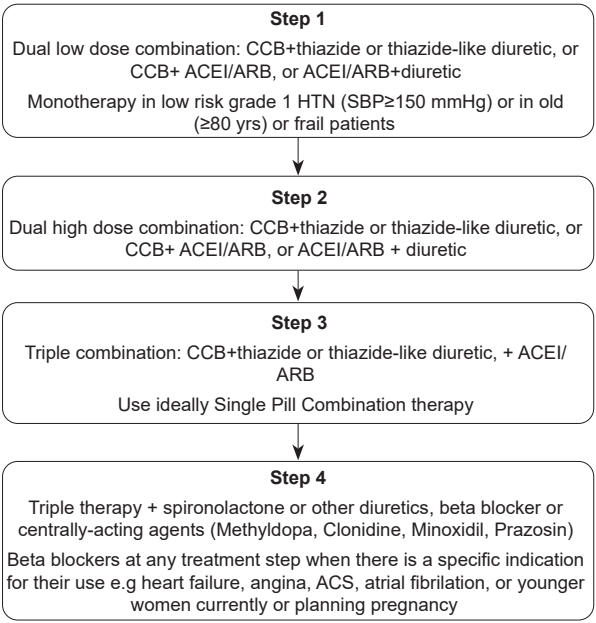
[b]Isolated systolic hypertension is graded 1, 2 or 3 according to SBP values in the ranges indicated.

The same classification is used for all ages from 16 years.

Table 2: Patient characteristics that raise suspicion for Secondary hypertension

Younger patients (<40 years) with grade 2 or 3 hypertension or hypertension of any grade in childhood
Sudden onset of hypertension in individuals with previously documented normotension
Acute worsening of BP control in patients with previously well controlled by treatment
True resistant hypertension hypertension
Hypertensive emergency
Severe (grade 3) or malignant hypertension
Severe and/or extensive HMOD, particularly if disproportionate for the duration and severity of the BP elevation
Clinical or biochemical features suggestive of endocrine causes of hypertension
Clinical features suggestive of renovascular hypertension or fibromuscular dysplasia
Clinical features suggestive of obstructive sleep apnea
Severe hypertension in pregnancy (>160/110mmHg) or acute worsening of BP control in pregnant women with pre-existing hypertension

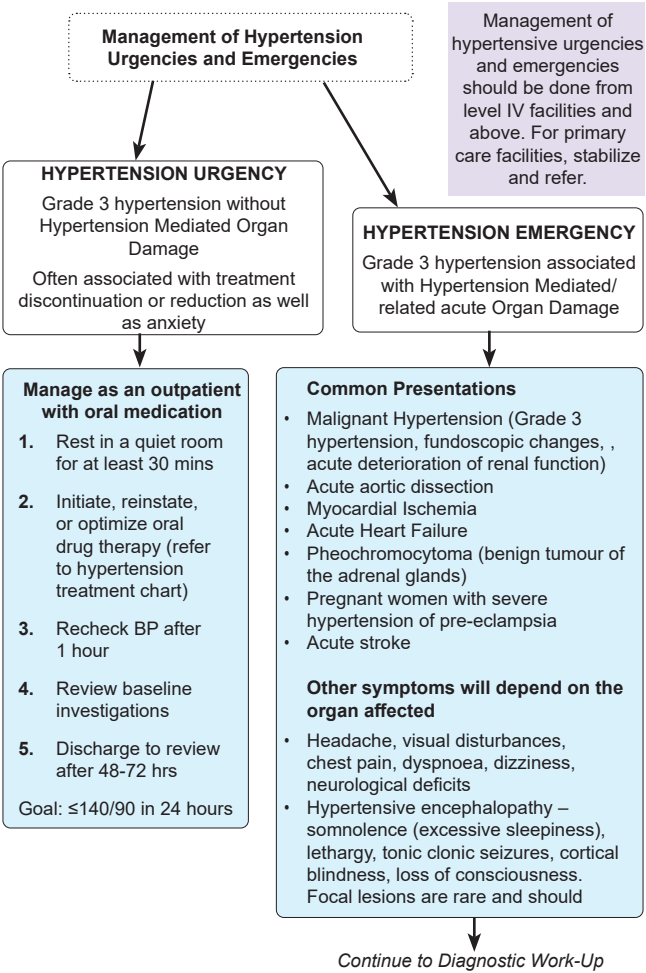

HYPERTENSION TREATMENT
HYPERTENSION TREATMENT
GRADE 3 HYPERTENSION
See Chart for management of hypertension urgencies and emergencies (page 12).
Blood pressure ≥ 140/90mmHg in adults > 18 years (For age ≥ 80 years, BP ≥ 150/90 or ≥140/90 if high risk (Diabetes, Kidney disease)
Start lifestyle changes
(Lose weight, reduce dietary salt and alcohol, stop smoking)
Grade 1: 140 - 159/90-99 (Without other cardiovascular risk factors or abdominal findings)
Grade 2: ≥ 160/100
Hypertension with comorbidities/ complications
Monitors lifestyle management up to 3 months
Goal BP achieved (<140/90)
No
Start antihypertensive Therapy
yes
Continue follow-up
Stepwise approach (page 11)



CCB,calcium channel blocker: ACEL angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; HTN, hypertension; ACS, acute coronary syndrome

Notes:

- The stepwise titration should be continued till treatment targets are achieved
- Patient should remain on the treatment for at least three months before escalation to the next step
- Other causes of elevated BP despite treatment should be ruled out before up-titration: non-adherence, white-coat hypertension or incorrect BP measurement technique.
- Treatment target: BP <140/90mmHg
- Follow up: Monthly until goal BP is achieved, then every 4-6 months. Review earlier if patient develops symptoms e.g., headache, persistent cough
- Step 4 should only be instituted in consultation with a physician


Management of Hypertension Urgencies and Emergencies
Management of hypertensive urgencies and emergencies should be done from level IV facilities and above. For primary care facilities, stabilize and refer.
HYPERTENSION URGENCY
Grade 3 hypertension without Hypertension Mediated Organ Damage
Often associated with treatment discontinuation or reduction as well as anxiety
HYPERTENSION EMERGENCY
Grade 3 hypertension associated with Hypertension Mediated/ related acute Organ Damage
Manage as an outpatient with oral medication
1. Rest in a quiet room for at least 30 mins
2. Initiate, reinstate, or optimize oral drug therapy (refer to hypertension treatment chart)
3. Recheck BP after 1 hour
4. Review baseline investigations
5. Discharge to review after 48-72 hrs
Goal: ≤140/90 in 24 hours
Common Presentations
• Malignant Hypertension (Grade 3 hypertension, fundoscopic changes, , acute deterioration of renal function)
• Acute aortic dissection
• Myocardial Ischemia
• Acute Heart Failure
• Pheochromocytoma (benign tumour of the adrenal glands)
• Pregnant women with severe hypertension of pre-eclampsia
• Acute stroke
Other symptoms will depend on the organ affected
• Headache, visual disturbances, chest pain, dyspnoea, dizziness, neurological deficits
• Hypertensive encephalopathy – somnolence (excessive sleepiness), lethargy, tonic clonic seizures, cortical blindness, loss of consciousness. Focal lesions are rare and should
Continue to Diagnostic Work-Up

DIAGNOSTIC WORK-UP

Common test for all potential causes
Fundoscopy is a critical part of the diagnostic workup
12-lead ECG
Haemoglobin, platelets count, fibrinogen
Creatinine,eGFR, electrolytes, LDH, haptoglobin
Urine albumin creatinine ratio urine microscopy for red blood cells, leucocytes ,cases
Pregnancy test in women of child bearing age
Specific tests by indication
Troponin, CK-MB (in suspected cardiac involvement, e.g acute chest pain or acute heart failure) and NT - proBNP
Chest X-ray (fluid overload)
Echocardiography (aortic dissection, heart failure ,or ischemia
CT angiography of thorax and/or abdomen in suspected acute aortic disease (e.g. aortic dissection)
CT or MRI brain (nervous system involvement)
Renal ultrasound (renal impairment or suspected renal artery sternosis)
Urine drug screen (suspected methamphetamine or cocaine).

CK-MB = creatinine muscle/brain; CT = computed tomography, ECG = eletrocardiogram eGFR = estimated glomerular filtration rate, LDH = lactate dedehydrogenase MRI = magnetic resionance imaging. NT - proBNP = N - terminal pro-B natruretic peptide.

MANAGEMENT OF HYPERTENSIVE EMERGENCY

Emergency	Management options
Acute Ischemic stoke	Antihypertensive therapy is not routinely recommended for patients with acute stroke and HTN.
Acute Intracerebral hemorrhage	BP lowering when the SBP is > 200mmHg or the DBP is >110mmHg. If signs of increased ICP, maintain MAP just below 130mmHg (or SBP< 180mmHg) for first 24 hours after onset. Patients without increased ICP,maintain MAP < 110mmHg (or SBP<160mmHg) for first 24 hours after onset.

Subarachnoid hemorrhage	Maintain SBP < 160mmHg until the aneurysm is treated or celebral vasospasm occurs. Oral nimodipine is used to prevent delayed ischemic neurological deficits, but it is NOT indicated for treating acute hypertension.
Aortic dissection	Immediately reduce the SBP < 110mmHg and maintain it at this level unless signs of endorgan hypo perfusion are present. Preferred treatment includes a combination of; a) narcotic analgesics (morphine sulphate), b) β-blockers (labetalol ,esmolol) or calcium channel blockers (verapamil, dilitiazem); Avoid β-blockers if there is aortic valular regurgitation or suspected cardiac tamponade.
Acute Coronary syndrome	Treat if SBP > 160mmHg and/or DBP > 100 mmHg. Reduce BP by 20-30% of baseline . Thrombolytics are contradicted if BP is >185/ 100 mmHg. Preferred medications include β-blockers & Nitroglycerin.
Acute Heart Failure	Treatment with vasodilators (in addition to diuretics) for SBP ≥ 140mmHg. IV or sublingual nitroglycerin is the preferred agent.
Preeclapsia/ eclampsia	Prepartum and intrapartum : SBP should be <160 mmHg and DBP < 110mmHg If the platelet count is 100,000 cells/mm, SBP should be maintained below 150/100 mmHg. Patients with eclampsia or preeclampsia should also be loaded with IV Magnesium sulphate 4gm diluted in 100mL NS over 15mins then with an infusion of 2gm/hr to avoid seizures. Preferred medications - Hydralazine, Labetalol, Nifedipine Medications to avoid - Nitroprusside, ACEIs, Esmolol

Indication For Immediate Referral To Physician/Gynecologist

- All pregnant women
- Pre-existing diabetes
- Fasting plasma glucose (FPG) indicates diagnosis of diabetes
- Abnormal results on urine dipsticks or blood tests
- Patients not attaining treatment targets after 3 months of treatment
- Hypertensive patients <18 years of age
- Secondary cause is suspected
- Associated clinical conditions: coronary heart disease, heart failure, chronic kidney disease, stroke or transient ischemic attack, peripheral arterial disease
- Patients ≥ 80 years with a fist time diagnosis of hypertension

Lifestyle Modifications

Table 3: Lifestyle modifications

- Avoid adding table salt and avoid or limit consumption of high salt foods such as soy sauce, fast foods and processed food including breads and cereals high in salt.
- Eating a diet that is rich in whole grains, fruits, vegetables, polyunsaturated fats, and dairy products and reducing food high in sugar, saturated fat, and trans fats, such as the DASH diet (http://www.dashforhealth.com).
- Moderate consumption of coffee, green and black tea. Other beverages that can be beneficial include hibiscus tea and cocoa
- Avoidance or moderation of alcohol consumption and avoidance of binge drinking
- Weight reduction, and a waist-to-height ratio <0.85 is recommended
- Smoking cessation and referral to smoking cessation programs
- Moderate intensity aerobic exercise (walking, jogging, cycling, yoga, or swimming) for 30 minutes on 5–7 days per week
- Stress reduction and introduction of mindfulness or meditation into the daily routine.
- Reduce exposure to air pollution

Table 4: Antihypertensive Agents and their Common Side Effects

Class	Examples	Initiating dose	Maximum daily dose	Possible side effects
Long-acting CCB	Amlodipine	5 mg OD	10 mg OD	• Oedema • Fatigue • Headache • Palpitations
	Felodipine	5 mg OD	10 mg OD	
	Nifedipine (Long-acting is preferred, since it is OD dosing)	Retard tabs: 10-20 mg BD		
Thiazide diuretic	Chlorthalidone	25 mg OD	50 mg OD	• Hypokalaemia • Hyponatraemia, • Hyperuricaemia • Hypocalciuria, • Hyperglycaemia • Rash • Dyslipidaemia • Cough (ACEI) • Hyperkalaemia • Increased serum creatinine • Angioedema
	Hydrochlorothiazide (HCTZ)	12.5 mg OD	25 mg OD	
Thiazide-like diuretic	Indapamide	2.5 mg OD	5 mg OD	
ACE inhibitor	Captopril	25-50 BD or TDS	50 mg TDS	
	Enalapril	5-20 mg daily in 1 or 2 divided doses	20 mg daily in 1 or 2 divided doses	
	Lisinopril	10 mg OD	40 mg OD	
	Perindopril	4 mg OD or 5 mg OD	8 mg OD or 10 mg OD	
	Ramipril	2.5 mg OD	10 mg OD	
ARB	Candesartan	8 mg OD	32 mg OD	
	Irbesartan	150 mg OD	300 mg OD	
	Losartan	50 mg OD	100 mg OD	
	Telmisartan	40 mg OD	80 mg OD	
	Valsartan	80 mg OD	160 mg OD	

CCB: Calcium channel blocker; ACE: angiotensin converting enzyme; ARB: angiotensin receptor blocker OD: administer once daily; BD: administer twice daily; TDS: administer 3 times daily

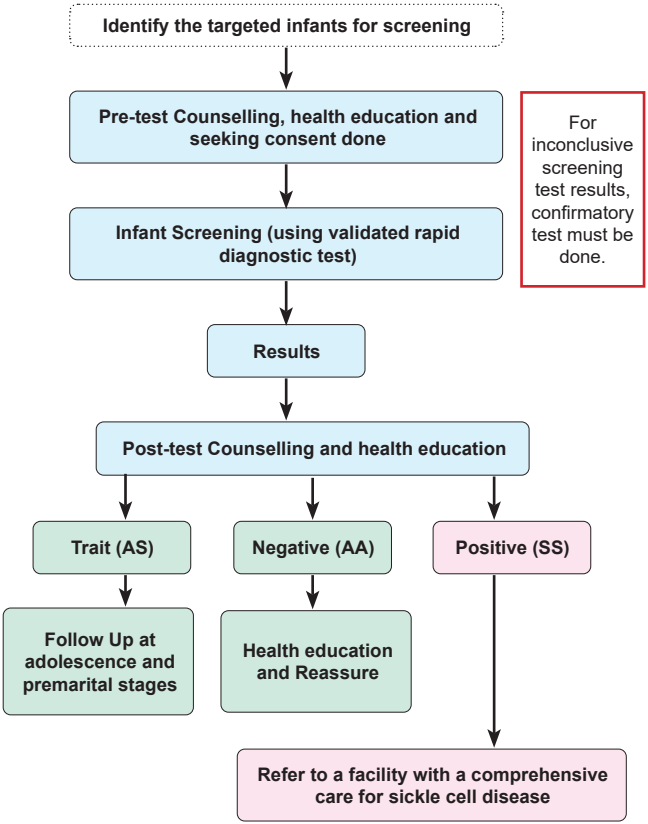
3. SICKLE CELL DISEASE

3.

3.1. Infant Screening

- At least **14,000** children in Kenya are born each year with Sickle Cell Disease.
- The disease is common across Kenya with high disease burden pockets in **Western, Nyanza** and **Coastal regions.**
- Infant screening is recommended as a method of early detection for early intervention in sickle cell disease to improve health outcomes.
- Screening targets infants during the 6th week appointment but can be performed up to the age of one year.
- Screening is implemented in phases, starting with high burden counties, then extending to the rest of the country.

SCREENING ALGORITHM



3.2 Initial Assessment

History (ask for)

- SCD related complications and their frequency
- Other medical/surgical/maternal health problems
- Consistency of access to routine/emergency care
- Details of the pain episodes (precipitants, frequency, duration, and usual relievers)
- Surgery, number of blood transfusion, Drugs in use, Any Allergies,
- Major complications (stroke, renal failure etc.) SCD and other chronic illnesses; diabetes, hypertension etc. Immunization history, Weight,
- Family history SCD, blood transfusions

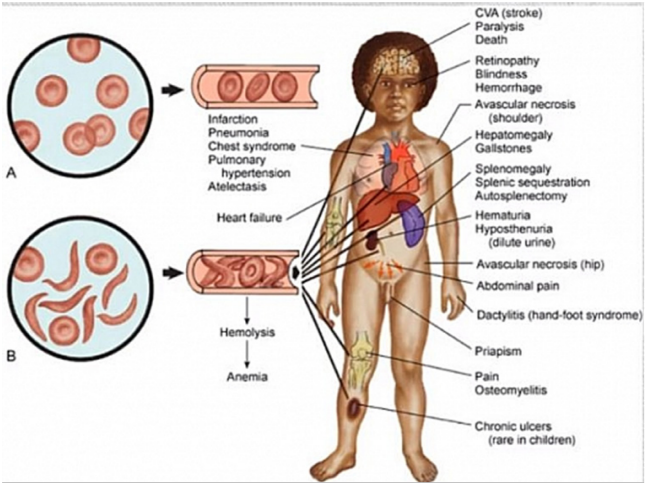
↓

Physical examination

- General - Weight, height, length/height plotting the BMI, SCD facies (frontal and parietal bossing and prominent maxilla) nutritional scores, jaundice, pallor, pain, stunted growth
- Systemic examination – Do standard examination (look, see, feel). Special focus as below: -
  - Abdominal - palpable splenic and hepatic enlargement
  - CVD- specifically look for right ventricular enlargement.
  - Respiratory – features of respiratory distress, crepitations, crackles
  - Neurological - SCD facies, focal neurological deficits
  - Musculoskeletal – Swelling of hands and feet, hip abnormalities, leg ulcers,
  - Urogenital- priapism

↓

Continue to Laboratory investigations



Laboratory investigations

Preliminary Tests-: Complete blood count, Peripheral blood film, Sickling test, Hemoglobin solubility test.

Screening Tests: Immunoassays – Haemotype B, Sickle SCAN test.

Confirmatory Tests: Electrophoresis (Hb Electrophoresis, Capillary Electrophoresis) High Performance Liquid Chromatography(HPLC)

Iso Electric Focusing (IEF)

Appropriate management

3.3. Management of common Emergencies

At primary healthcare facilities, the goal is to stabilize the patient and then refer for further management.

Refer to figure on pain management (page 24).

1. Pain Relief

Assess Pain Severity	Review home medication	Paracetamol 15mg/kg QDS +/- Ibuprofen 5mg/kg/Diclofenac 1mg/kg TDS

2. Vital signs and oxygen saturation assessment

Hourly first 6 hours	2-4 hourly when stabilized

3.Oxygen Administration

Within 15 minutes	Target Saturation > 95%

4. Intravenous access + Blood tests within 60 minutes

Request full blood count result to be available within 1 hour	Target SatFull blood count, reticulocytes, liver function tests, urea, electrolytes, group & saveuration > 95%

Add IV antibiotics if child has fever, fast breathing / respiratory distress

Hydrate IV/Oral Fluids – within 60 minutes

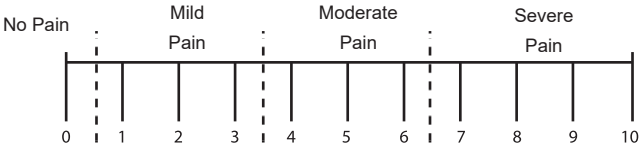
Document intake and output, review daily.	Oral route if able to drink & IV if poor oral intake or nil by mouth.	Give 1.5x normal maintenance {exept if stroke suspected - give 2/3 maintenance

Refer to paediatrician/physician for further management.

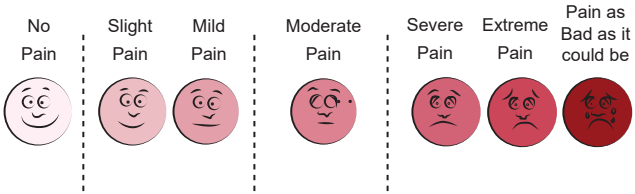
3.4. Painful crisis

3.4.1 Assessment

Adult pain scale



Children >3 years (Wong-Baker faces)



Children<3 years (Use FLACC: Face, Legs, Activity, Cry and Consolability assessment).

Face	0 No particular expression or smile	1 Occasional grimace or frown, withdrawn, disinterested	2 Frequent to constant frown, clenched jaw, quivering chin
Legs	0 Normal position or relaxed	1 Uneasy, restless, tense	2 Kicking, or legs drawn up
Activity	0 Lying quietly, normal position , moves easily	1 Squirting, shifting back and forth, tense	2 Arched, rigid, or jerking
Cry	0 No cry (awake or asleep)	1 Moans or whimpers, occasional complaints	2 Crying steadily scream or sobs, frequent complaints
Consolability	0 Content, relaxed	1 Reassured by occasional touching hugging or “taking to”. Distractable	2 Difficult to console or comfort

3.4.2 Management

Pain assessment and grading

Pain assessment and grading

1. Adequately hydrate with 150% of the normal daily fluid intake
2. Encourage oral fluids first, it should be used whenever possible
3. Give IV fluids if the patient is unable to drink well, has severe pain, abdominal symptoms, or is not settling
4. Stop IV fluids when the patient is stable, and pain is controlled
5. Maintain a strict input/output chart for every patient
6. Any crystalloids with sugar can be used. In children 5% Dextrose + 0.45% saline is preferred with a review needed for added potassium as per the Basic Paeditric Protocols 2016 for

PAIN AND APPROPRIATE MEDICAL MANAGEMENT		
MILD	MODERATE	SEVERE
Reassurance, massage, distraction Child: paracetamol 15mg/kg qds Adult paracetamol 1g qds	Treat as Mild pain and ADD Child: Ibuprofen 5mg/kg TDS OR Diclofenac 1mg/kg TDS Adult: Ibuprofen 400mg TDS Diclofenac 100mg TDS	Treat as moderate and ADD Child : Oral morphine 0.5 mg/kg 3-4 hourly as needed Adult: Oral morphine 5-10 mg 3-4 hourly as needed.

Fluid calculation	
Body wt (Kg)	Fluids(ml/kg/d)
0-10	150
>10-20	75ml/kg/day for every kilogram above 10kg ADDED TO 1500ml for the first 10kg of weight
>20	30ml/kg for every kg above 20kg added to 2250ml for the first 20kg of weight
Divide total daily volume by 24hrs to get hourly rates	

3.5. Management of acute severe complications

Note: *Severe complications should be managed at higher level facilities (level 4 and above). For primary healthcare facilities, stabilize the patient and refer.*

Crisis type	Presentation	Management
Acute chest syndrome	If >1 of the following: **1.** Cough, Wheeze, Fever, Tachycardia **2.** Acute chest pain worse with breathing **3.** Respiratory distress with clinical signs of consolidation **4.** Hypoxia (SaO2 <95% room air), and or cyanosis	Admission, pain control, fluids (oral/IV), antibiotics, blood transfusion; oxygen to keep SaO2 >95%
Severe anemia/ Hemolytic crisis	Hb is below 5g/dl or acute drop of more than 2g/dl from baseline or acute drop in Hb >2g/dl below steady state. Symptoms of severe anaemia, shock, jaundice, splenomegaly, hepatomegaly.	If haemolysing: **1.** Transfuse immediately if symptomatic or Hb <5g/dl **2.** Top-up to steady state level if asymptomatic and Hb >5g/dl If aplastic: **1.** Transfuse immediately if symptomatic or Hb <5g/dl **2.** Whole blood: 20mls/kg or Packed RBC 10mls/kgm
Sequestration Crisis	**1.** Severe Pallor **2.** Lethargy **3.** Hypotension, tachycardia, hypovolaemia **4.** Abdominal pain and distension **5.** Fever **6.** Increasing splenomegaly	Analgesia: if in shock, bolus normal saline 20ml/kg as awaits blood; transfusion, broad-spectrum antibiotics (give examples); oxygen to keep SaO2 >95%

Neurological	**1.** Change in neurological status (weakness/slurred speech/ blurred vision/ behavior change/altered consciousness/seizure, AVPU <A) **2.** Headache **3.** Raised Intracranial Pressure (ICP), bradycardia, hypertension, sluggish pupils **4.** History of previous stroke.	**1.** Exchange transfusion **2.** Antibiotics or Acyclovir for Bacterial or viral meningitis **3.** Antimalarials as necessary **4.** Anticonvulsants for convulsions **5.** Dexamethasone for increased intracranial pressure
Priapism	Persistent penile erection that continues hours beyond or is unrelated to sexual stimulation	**1.** Increase fluid intake **2.** Analgesia and anxiolytic agents e.g diazepam **3.** Catheterize and attempt micturition **4.** Walking and warm baths may also help avert early priapism Advanced care by specialists (Exchange transfusion; Surgical intervention)

3.6 Follow up and long-term care

Follow-up

- Patient started on hydroxyurea should be reviewed with CBC after 2 weeks.
- For the first year, follow up should be monthly until stable.
- Follow up should be at least once every 8-12 weeks for stable patients.
- CBC, reticulocytes, and film (including HbA:S ratio only if recently transfused)
- U+Es, Creatinine, urinalysis, LFTs when necessary, at least once a year and when required.
- Cardiology review annually for related heart conditions
- ECHO at 3 years; repeat every five years to screen for pulmonary hypertension.
- Retinopathy screening: from 10 years (every 1-2 years)
- Transcranial doppler annually (2-16years) >16 years continue with CT head or MRI annually.
- Chronically transfused, measure serum ferritin 3 monthly
- Refill medication – hydroxyurea, folic acid, prophylactic antibiotics, antimalarials and vaccinations (See the table on the next page for details)

Further guidance for routine care for patients with sickle cell disease is shown below:

Modality	Indications	Dosing
Penicillin Prophylaxis	• Penicillin prophylaxis started within 2 months of life and continued until 5 years of age. • Can be continued until later in life for children who have had more than two episodes of severe pneumonia. • Patients who have had surgical splenectomy given for life.	• Children less than 3 years: Penicillin V syrup 125mg twice daily. • Children more than 3 years: Penicillin V syrup/ tablets 250mg twice daily. • Patients with penicillin hypersensitivity may use erythromycin as an alternative.
Vaccination	Routine immunizations	As per KEPI schedule
	Pneumococcal Polysaccharide Vaccine (Pneumo-23)	At 2 years and once every 5years
	Meningococcal vaccine	2 doses for those below 2 years of age and one dose for those above 2years
	Influenza vaccine	Annually
	Hemophilus influenza type B	Booster at 18months
Hydroxyurea	Children over 9 months	20 mg/Kg/day, titrated as necessary up to 35mg/kg/ day; unless dose limiting toxicity is experienced).
	Adult with 3 or more severe vascular occlusive crises in a year	
	Two or more severe acute chest syndrome in a lifetime	
	Chronic severe anaemia	
	When chronic transfusion is indicated but not feasible	
	Recurrent priapism	
	Chronic kidney disease and are taking erythropoietin	

Blood transfusion	Acute anaemia (drop in Hb >2g/dl from normal steady state Anemia	Simple transfusion
	Acute ischaemic sequestration	Simple transfusion
	Acute ischaemic stroke	Exchange transfusion to Hb of 10g/dL, HbS <30%
	Acute chest syndrome	Depending on severity: No transfusion, simple or exchange transfusion
	Acute priapism	Consider simple or exchange transfusion if no response to initial treatment
	Multiorgan failure, acute sickle hepatopathy, severe sepsis	Exchange transfusion to Hb 10g/dL, HbS <30%
	Primary stroke prevention; Prevention of stroke recurrence; Recurrent acute chest syndrome; Chronic organ damage such as chronic renal failure or chronic lung disease; Pulmonary hypertension; Leg ulcers if other treatments are ineffective or contraindicated.	Chronic Transfusion Therapy (maintain HbS level <30%; Hb10-11g/dl)
Pain management	Mild	Reassurance, hot packs, reposition, massage, distraction Child: paracetamol 15mg/kg every 6 hours Adult: paracetamol 1g every 6 hours
	Moderate	Treat as Mild pain and ADD Child: Ibuprofen 5mg/kg TDS; Adult: Ibuprofen 400mg TDS
	Severe	Treat as Moderate and ADD Child: Oral morphine 0.5mg/kg 3-4 hourly as needed Adult: Oral morphine 5-10mg 3-4 hourly as needed

Malaria Prophylaxis	Patients living in high transmission malaria areas	Proguanil Under 1 year: 1/4 tablet (25 mg) daily 1 to 4 years: 1/2 tablet (50 mg) daily 5 to 8 years: 1 tablet (100 mg) daily 9 to 14 years: 1 1/2 tablets (150 mg) daily Over 14 years: Adult dose daily
		Mefloquine (5 mg/kg body weight once a week) 5-10 kg: 1/8 film-coated tablet 10-20 kg: 1/4 film-coated tablet 20-30kg: 1/2 film-coated tablet 30-45kg: 3/4 film-coated tablet > 45 kg: 1 film-coated tablet
Nutritional support	All SCD patients	Balanced diet; folic acid supplementation
Psychosocial support	All SCD patients and their families	Within the healthcare system or as part of patient support groups.

4. DIABETES MELLITUS

4.1 Screening for type 2 Diabetes

Table 5: Criteria for Testing type 2 diabetes or Prediabetes.

Adults	Children and adolescents

• Testing should be considered in adults who are overweight or obese (BMI ≥ 25kg/m2 or ≥ 23 kg/m2 in Asians) who have one or more of the following risk factors:
  • First degree relative with diabetes
  • History of CVD
  • Hypertension (≥ 140/90 mmHg or on therapy for hypertension)
  • HDL cholesterol < 35 mg/dl (0.90 mmol/L) and/or a triglyceride level > 250 mg/dl (2.82 mmol/L)
  • Women with polycystic ovary syndrome
  • Physical inactivity (Less than 150 hours/ week of at least moderate intensity physical activity)
  • Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
• Persons with prediabetes (A1c ≥ 5.7%), impaired glucose tolerance, or impaired fasting glucose
• Women who were diagnosed with GDM should have lifelong testing at least every 3 years.
• For all other people, testing should begin at the age of 35 years.
• HIV
• TB
• All patients on steroid therapy
• Patients on atypical antipsychotics (olanzapine, risperidone, aripiprazole, quetiapine, paliperidone, lurasidone and clozapine)
• If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results and risk status.
	Testing should be considered in youth who are overweight (BMI ≥ 85th percentile) or obese (BMI ≥ 95th percentile) and who have one or more additional risk factors based on the strength of their association with diabetes:
	• Maternal history of diabetes or GDM during the child's gestation
	• Family history of type 2 diabetes in first- or second-degree relative
	• Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovary syndrome, or small-for-gestational-age birth weight)

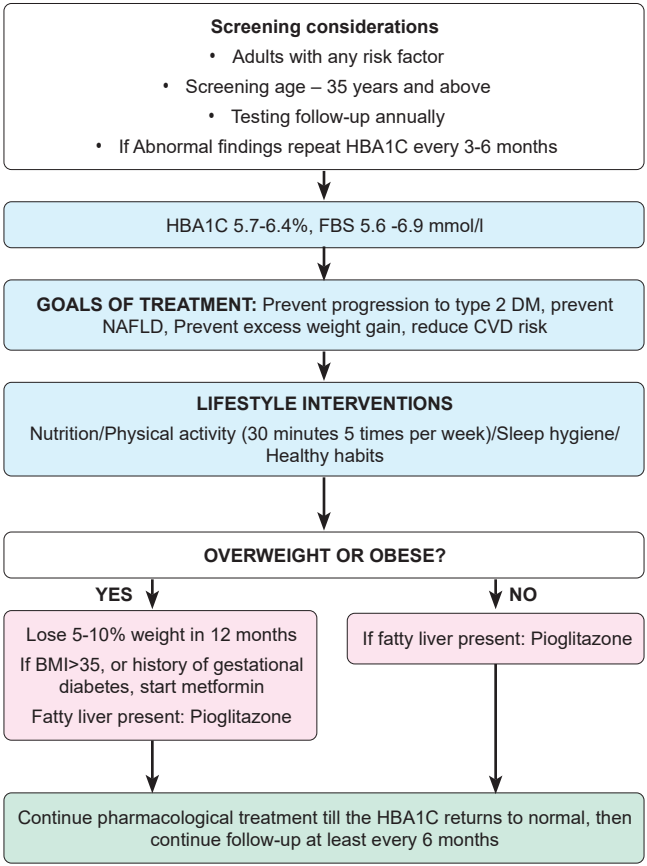
4.2 Diagnosis of diabetes

Table 6: Diagnostic criteria for Diabetes Mellitus

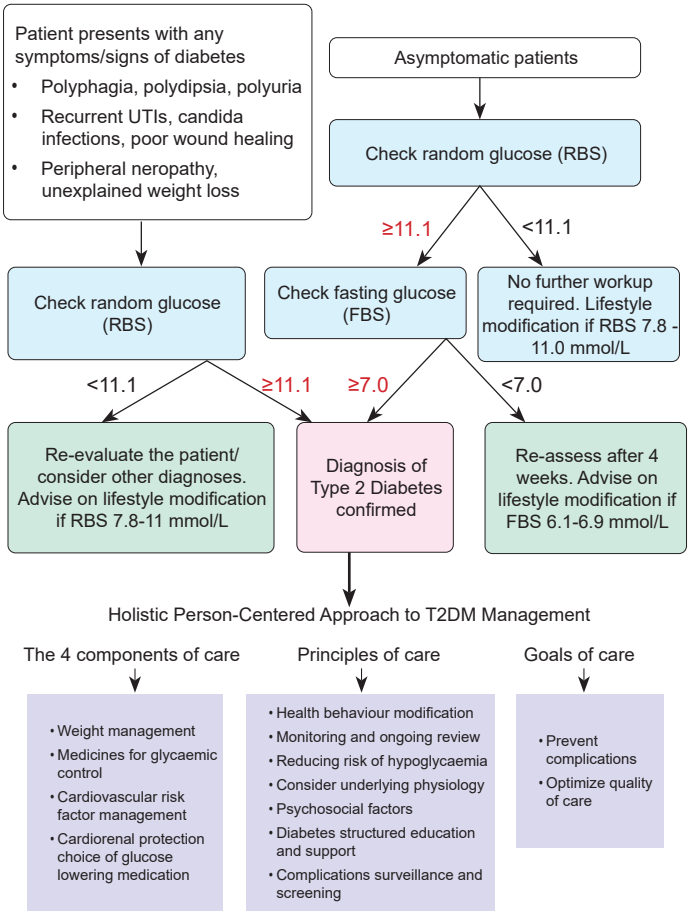
Diagnostic Test	Prediabetes (Intermediate hyperglycaemia)	Diabetes
A1C	5.7-6.4%	≥ 6.5%
Fasting plasma glucose	5.6-6.9 mmol/L (100-124mg/dl)	≥ 7.0 mmol/L (126mg/dl)
2-hour plasma glucose during 75g-OGTT	7.8-11.0 mmol/L (140-198mg/dl)	≥ 11.1 mmol/L (200mg/dl)
Random plasma glucose	-	≥ 11.1 mmol/L (200mg/dl)

NB: *Fasting is defined as no caloric intake for at least 8 hours*

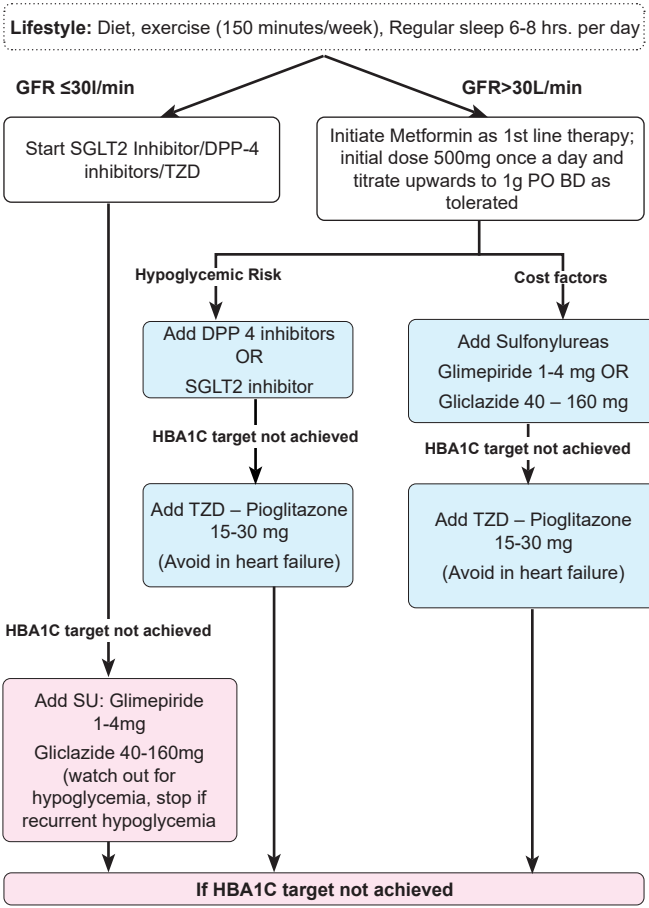
4.3 Management of Prediabetes



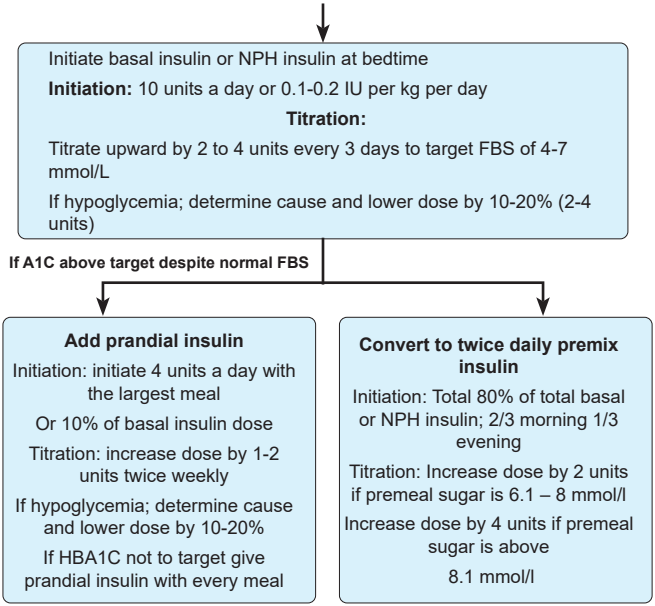
4.4 Diagnostic Cascade for Type 2 Diabetes



4.5 Management of type 2 diabetes



Continue to Initiate basal insulin or NPH insulin at bedtime



Notes:

1. SGLT2 inhibitor should be initiated with metformin in those with high cardiovascular risk or CKD and GFR above 30 even if HBA1C is within target.
2. Insulin initiation should be done at level 4 and above, but patients referred for follow-up at levels 2 and 3.

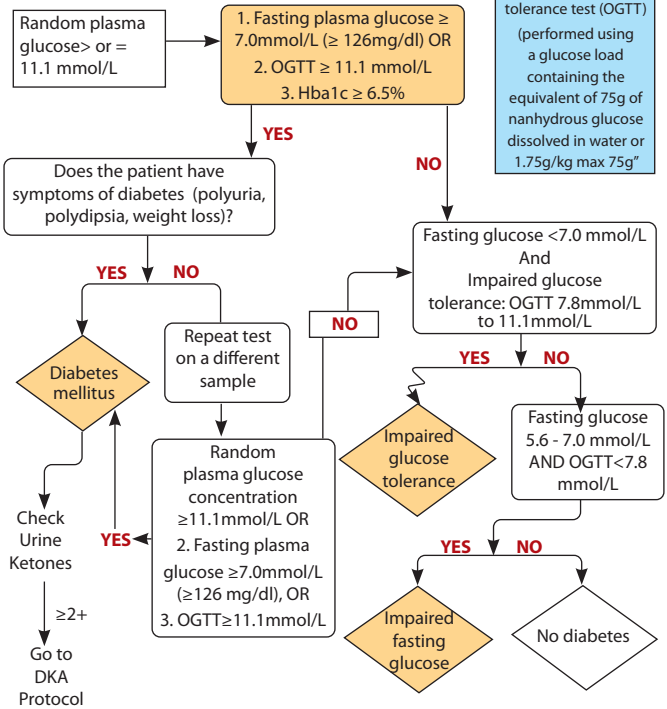
Table 7: Treatment targets for diabetes

Parameter	Target
HbA1c (%)	<7.0
Fasting/pre-prandial glucose (mmol/L)	4.4-7.2

4.6 Physical Activity in Diabetes:

- Optimizing physical activity is an integral part of the management of diabetes
- Both aerobic and resistance exercise confer benefit in diabetes
- Children and adolescents with type 1 or type 2 diabetes or prediabetes should engage in 60 min/day or more of moderate- or vigorous-intensity aerobic activity, with vigorous muscle-strengthening and bone-strengthening activities at least 3 days/week
- Most adults with type 1 and type 2 diabetes should engage in 150 min or more of moderate- to vigorous-intensity aerobic activity per week, spread over at least 3 days/week, with no more than 2 consecutive days without activity. Shorter durations (minimum 75 min/week) of vigorous-intensity or interval training may be sufficient for younger and more physically fit individuals.
- All people with type 2 diabetes should be encouraged to perform 150 minutes of aerobic exercise, at 50 to 70% of maximal heart rate, per week, as well as resistance training three (3) times per week.
- Adults with type 1 and type 2 diabetes should engage in 2–3 sessions/week of resistance exercise on nonconsecutive days.
- Flexibility and balance training are recommended 2–3 times per week for older adults with diabetes
- All adults, and particularly those with type 2 diabetes, should decrease the amount of time spent in daily sedentary behavior. Prolonged sitting should be interrupted every 30 min for blood glucose benefits. Examples include walking, yoga, housework, gardening, swimming, and dancing.

Criteria for the diagnosis of type 1 DM



Check blood Random blood sugar for:

- All severely sick children
- Children who present with the following signs/ symptoms
  - Polyuria
  - Unexplained weight loss
  - Fatigue
  - Secondary enuresis
  - Nocturia
  - Polyphagla (Rare in type 1 diabetes)
  - DKA symptoms (Vomiting, abdominal pain)

N/B: Beware diabetes may present like pneumonia, acute abdomen, gastroenteritis, malaria, menengitis and malnutrition

Insulin regimens in type 1 DM for children and adolescents

Basal-Bolus regimen

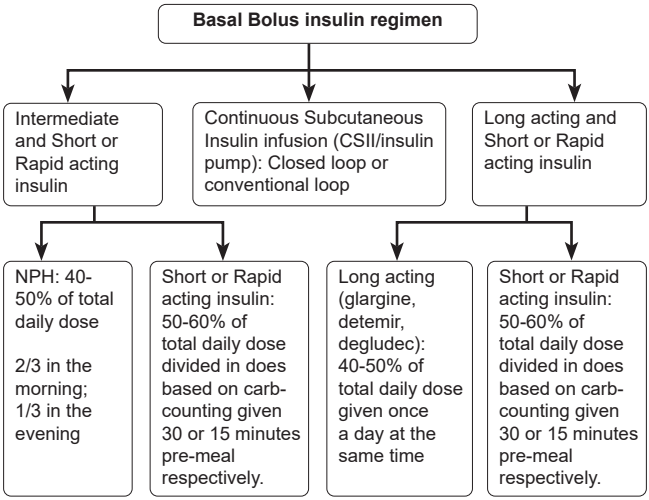
This is the recommended insulin regimen for type 1 diabetes, as it is closer to physiological norm.

It is a combination of a long- or intermediate-acting insulin given once or twice a day (basal) and boluses of a rapid- or short-acting insulin given with meals.

The long- or intermediate-acting insulin constitutes 40-50% of the total daily insulin dose.

Individual meal dose distribution of the 50-60% rapid- or short-acting insulin component is determined by the insulin: carbohydrate (I:C) ratio, which is not uniform for all the meals.

Mastery of carbohydrate-counting is, therefore, crucial for this regimen to be effective.



The I:C ratio is calculated using 450 or 500 rule, depending on whether short- or rapid-acting insulin is used.

The number 450 or 500 is divided by the total daily insulin dose including basal (use 450 if the patient is on short-acting insulin and 500 if rapid acting insulin.

Since the ratio varies with time over a 24-hour period, meal dose adjustments are made tailored to an individual's pattern.

The basal-bolus regimen requires close blood glucose monitoring to aid in making required individual adjustments.

Is there room for twice daily pre-mixed insulin?

NO!!! NOT FOR TYPE 1 DIABETES

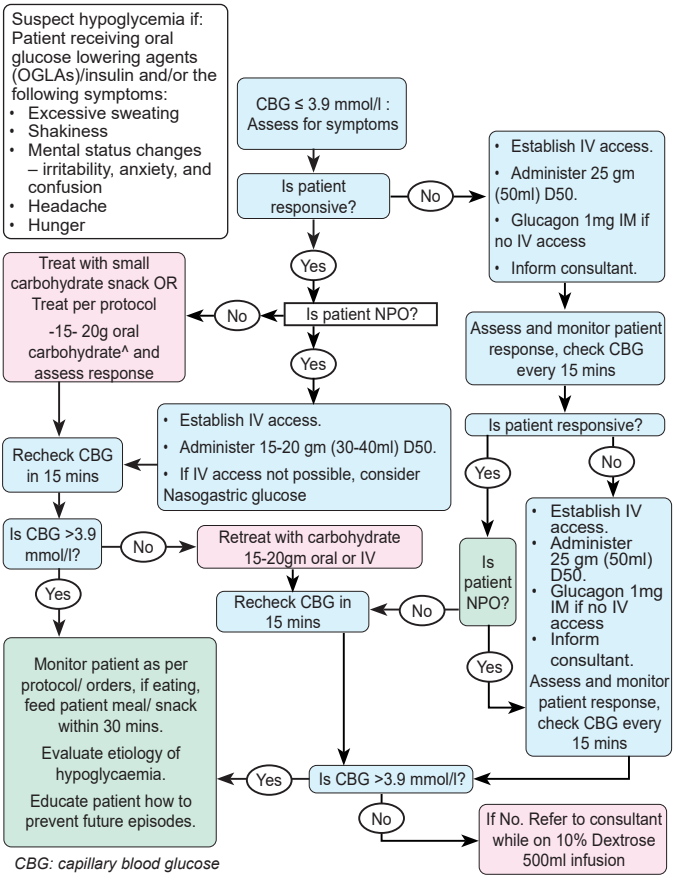
Twice daily injections of pre-mixed insulin is not a recommended insulin regimen for type 1 diabetes, because:

- It cannot provide good blood glucose control.
- It does not mimic the normal, physiological insulin-glucose interplay, so will be riddled with high and low blood glucose levels.
- It does not enable appropriate individualized insulin dose adjustments.

4.8 Acute complications of DM in adults

Hypoglycemia Management in Diabetes

Hypoglycaemia is when the blood glucose is </= 3.9mmol/l (70mg/dl)

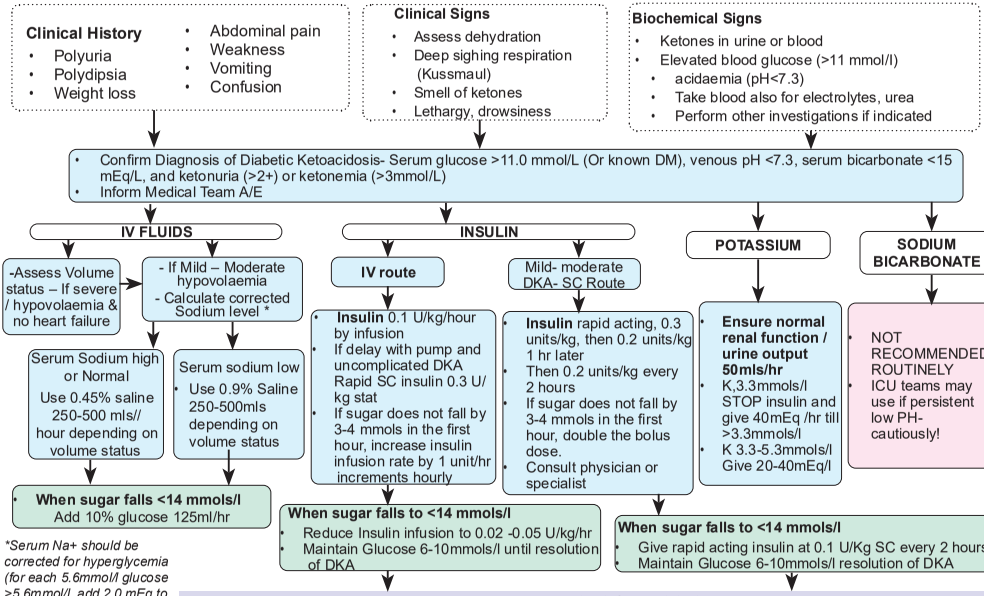


CBG: capillary blood glucose

4.9 Management of diabetic keto-acidosis (DKA) in adults

Table 8: Differences between diabetic keto-acidosis (DKA)and Hyperglycemic hyperosmolar state (HHS)

Parameter	DKA	HHS
Plasma glucose level	≥13.9 mmol/L (250 mg/dL), occasionally lower	≥33.3 mmol/L (600 mg/dL)
Urine Ketones	Positive	Negative (or weakly positive)

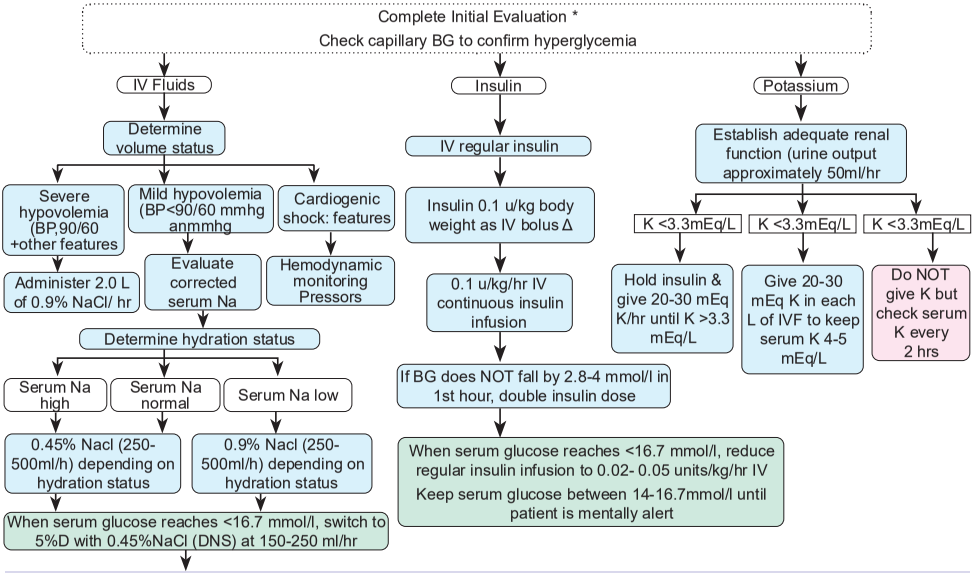


*Serum Na+ should be corrected for hyperglycemia (for each 5.6mmol/l glucose >5.6mmol/l, add 2.0 mEq to sodium value for corrected serum sodium value).

& Blood ketone >3mmol/l require treatment for DKA, levels <0.5mmol/l suggest resolution of DKA

Observations/ Transition:

- Hourly blood glucose for IV insulin, 2 hourly for SC
- Neurological status at least hourly
- Hourly fluid input/output
- Electrolytes, BUN, creatinine, venous PH, every 2-4 hours until stable
- Look for precipitating cause
- After DKA resolution and when patient able to eat, initiate SC multi-dose (basal-bolus insulin regimen)
- Continue IV insulin infusion for 2-4 hrs after starting SC insulin- ensure adequate plasma insulin levels
- In insulin naïve- start at 0.5-0.8 U/Kg/day, adjust as needed. Ketones every 4 hours



Check UEC & glucose every 2-4 hrs until stable
After resolution of HHS &when patient able to eat, initiate SC basal-bolus multi-dose insulin regimen
Continue IV insulin for 2-4 hours after SC insulin begun to ensure adequate plasma insulin levels
In insulin naïve patients, start at 0.5- 0.8 units/kg body weight/ day and adjust insulin as needed
Look for precipitating cause(s). ½ of TDD given as basal, ½ divided into bolus/ nutritional.

4.11 Diabetic Ketoacidosis (DKA) In Children and Adolescents

Biochemical criteria of diagnosis of DKA in children and adolescents

DKA is a common acute complication in type 1 diabetes and potentially fatal if there is a delay in management.

Diabetes (hyperglycemia)	Blood Sugar/ glucose >11 mmol/L
Ketosis	Blood ketones: ≥3 mmol/L OR Moderate/large urine ketones (urine ketones ≥2+)
Acidosis	Venous pH <7.3 and OR Bicarbonate <18 mmol/L

4.12 Severity of DKA in children and adolescents

Severity grading	Venous pH	Bicarbonate level (mmol/L)
Mild	7.2 to <7.3	10 to <18
Moderate	7.1 to <7.2	5 to <10
Severe	< 7.1	<5

4.13 Risk Factors for DKA

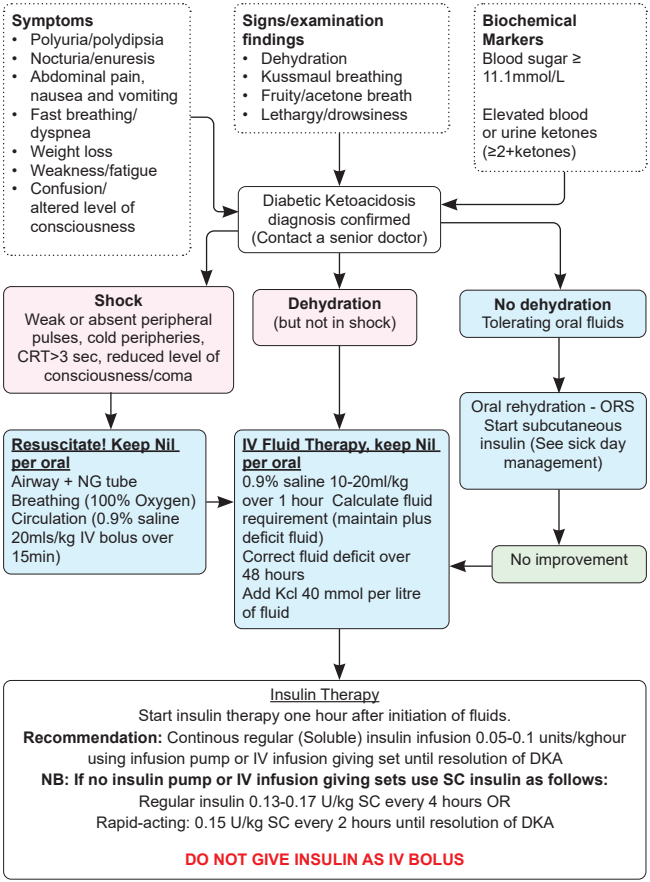
IN NEWLY DIAGNOSED PATIENTS

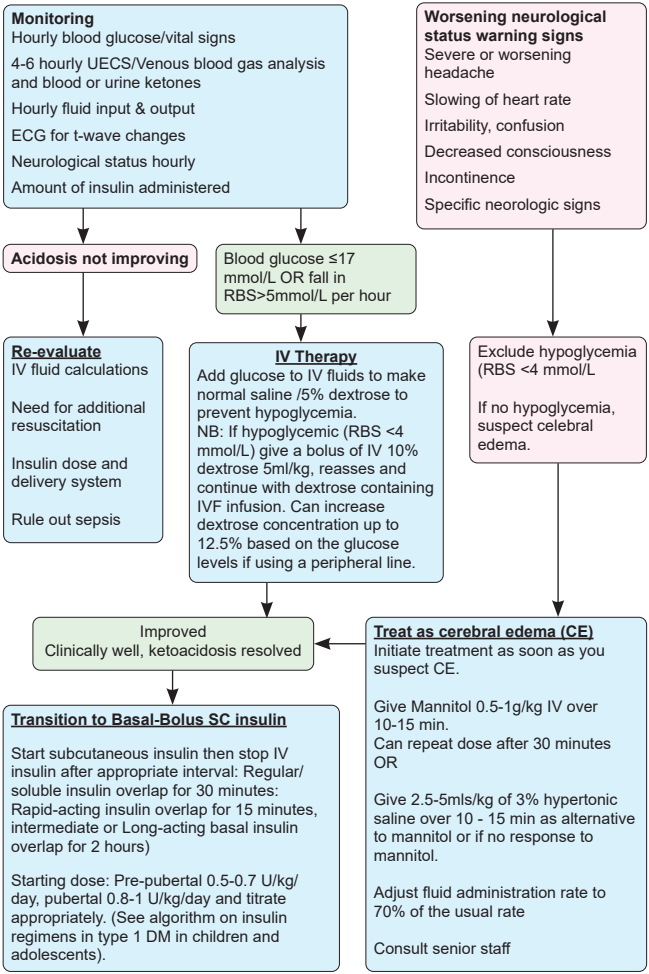
- Younger patients <5 yr
- Delayed diagnosis
- Lower Socioeconomic status
- Countries with low prevalence of type 1 diabetes

IN PATIENTS KNOWN TO HAVE DIABETES

- Insulin omission
- Poor metabolic control
- Previous DKA episodes
- Acute GE with persistent vomiting and inability to maintain hydration
- Peripubertal and adolescent girls/ eating disorders
- Limited access to health services
- Insulin pump failures
- Binge alcohol consumption

4.14 Management of DKA in children and adolescents




Monitoring
Hourly blood glucose/vital signs
4-6 hourly UECS/Venous blood gas analysis and blood or urine ketones
Hourly fluid input & output
ECG for t-wave changes
Neurological status hourly
Amount of insulin administered
Worsening neurological status warning signs
Severe or worsening headache
Slowing of heart rate
Irritability, confusion
Decreased consciousness
Incontinence
Specific neorologic signs
Acidosis not improving
Blood glucose ≤17 mmol/L OR fall in RBS>5mmol/L per hour
Re-evaluate
IV fluid calculations
Need for additional resuscitation
Insulin dose and delivery system
Rule out sepsis
IV Therapy
Add glucose to IV fluids to make normal saline /5% dextrose to prevent hypoglycemia.
NB: If hypoglycemic (RBS <4 mmol/L) give a bolus of IV 10% dextrose 5ml/kg, reasses and continue with dextrose containing IVF infusion. Can increase dextrose concentration up to 12.5% based on the glucose levels if using a peripheral line.
Exclude hypoglycemia (RBS <4 mmol/L
If no hypoglycemia, suspect celebral edema.
Improved
Clinically well, ketoacidosis resolved
Treat as cerebral edema (CE)
Initiate treatment as soon as you suspect CE.
Give Mannitol 0.5-1g/kg IV over 10-15 min.
Can repeat dose after 30 minutes
OR
Give 2.5-5mls/kg of 3% hypertonic saline over 10 - 15 min as alternative to mannitol or if no response to mannitol.
Adjust fluid administration rate to 70% of the usual rate
Consult senior staff
Transition to Basal-Bolus SC insulin
Start subcutaneous insulin then stop IV insulin after appropriate interval: Regular/ soluble insulin overlap for 30 minutes: Rapid-acting insulin overlap for 15 minutes, intermediate or Long-acting basal insulin overlap for 2 hours)
Starting dose: Pre-pubertal 0.5-0.7 U/kg/ day, pubertal 0.8-1 U/kg/day and titrate appropriately. (See algorithm on insulin regimens in type 1 DM in children and adolescents).

POTASSIUM

- In DKA the total body potassium is low.
- Hypokalemia: If potassium is <3.5 mmol/L, start replacement at the time of initial resuscitation/ volume expansion (during 1st one hour) and before starting insulin therapy (40 meq per litre of IV fluid).
- Normokalemia: If potassium 3.5-5.5 mmol/L, start replacing after initial volume expansion (after 1st one hour) and concurrent with starting insulin therapy at a dose of 40 mmol of KCl per litre of fluid given (maximum 0.5 mmol/kg/hr).
- Hyperkalemia: If potassium >5.5 mmol/L, delay initiation of potassium until there is urine output. Start KCl infusion when potassium is <5.5 mmol/L.
- Monitor potassium every 2-4 hours.
- Once taking orally and still hypokalemic, replace with oral KCl (1-4 mmol/kg/day in 4 divided doses (max 100 mmol/24 hours)

Fluid therapy: Maintenance and Deficit

Choice of Fluid: Normal Saline. If unavailable use Ringer's Lactate.
Calculation of maintenance fluid for 24 hours

- 1st 10 kg: 100 ml/kg, 2nd 10 kg 50ml/kg, any weight above 20 kg, 20ml/kg; e.g., in a 20 kg child, maintenance fluid is 1500 ml.

Calculation of deficit fluid:

- Weight x 10 x % dehydration
- Example: Shock/ severe DKA - Assume 10% dehydration: e.g., in a 20 kg child, deficit is 10 x10 x 20 = 2000 ml as deficit fluid.

Calculation of the total fluid required for 48 hours: Total maintenance fluid for 2 days + deficit – resuscitation fluid
NB – Subtract the initial resuscitation fluid from the total fluid calculated over 48 hours

Insulin Therapy

- To calculate the regular (soluble) insulin dose for IV infusion, dilute 50 units of regular (soluble) insulin in 50mls of 0.9% saline therefore 1 unit of insulin = 1 ml.
- Insulin infusion starting dose: children > 5 years 0.1 U/kg/hour, <5 years 0.05 U/kg/hour.
- Do not give insulin as IV bolus.
- Plasma glucose concentration should fall at a rate of 2-5 mmol/L/h.
- If the rate of fall is precipitous (> 5mmol/L/h), add 5% dextrose to the fluid. Can increase dextrose concentration up to 12.5% if using peripheral line.
- Once DKA resolves, transition to subcutaneous insulin (starting dose: pre-pubertal 0.5-0.7 U/kg/day, pubertal 0.8-1 U/kg/day). The best time to transition is just before meals. Transition to basal-bolus regimen (see chapter on introduction to insulin for dosing).
- **DO NOT GIVE BICARBONATE:** Consult Paediatrician/ Intensivist/ Paediatric endocrinologist if patient has severe acidosis (venous pH of <6.9, life-threatening hyperkalemia or impaired cardiac contractility).

4.15 DKA fluid management

Fluid Maintenance and replacement volumes based on body weight and assumption of 10% dehydration (*Replace after 48 hours)

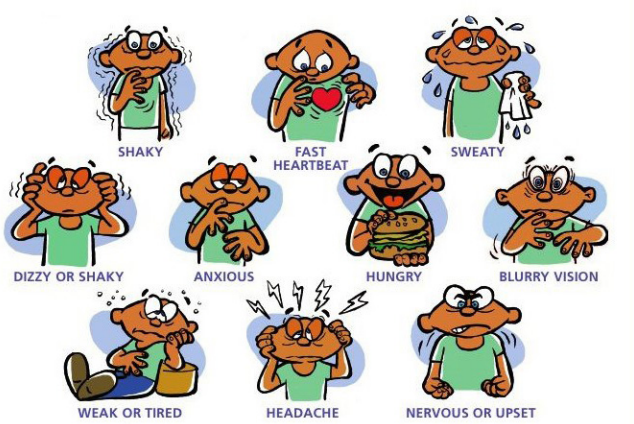
Body Weight (Kg)	Maintenance (mL/24hr)	DKA: Give Maintenance + 5% of body weight (50mL/kg/24hr)	
		mL/24hr	mL/hr
4	325	530	22
5	405	650	27
6	485	790	33
7	570	920	38
8	640	1040	43
9	710	1160	48
10	780	1280	53
11	840	1390	58
12	890	1490	62
13	940	1590	66
14	990	1690	70
15	1030	1780	74
16	1070	1870	78
17	1120	1970	82
18	1150	2050	85
19	1190	2140	89
20	1230	2230	93
22	1300	2400	100
24	1360	2560	107
26	1430	2730	114
28	1490	2890	120
30	1560	3060	128
32	1620	3220	134
34	1680	3360	140
36	1730	3460	144
38	1790	3580	149
40	1850	3700	154
45	1980	3960	165
50	2100	4200	175
55	2210	4420	184
60	2320	4620	193
65	2410	4820	201
70	2500	5000	208
75	2590	5180	216
80	2690	5380	224

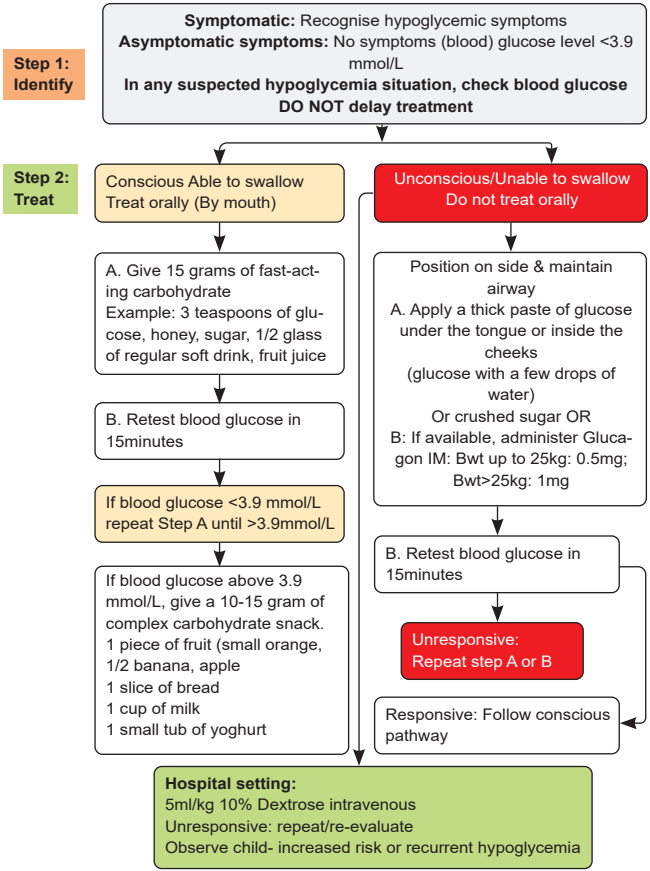
4.16 Management of hypoglycemia in children and adolescents with type 1 DM

Hypoglycemia is a common occurrence in the management of T1DM. It is as a result of a mismatch between insulin administered and food consumed. It can be defined as:

1. Clinical Hypoglycemia alert: Blood glucose <3.9 mmol/L
2. Clinically important or serious hypoglycemia: Blood glucose <3.0 mmol/L
3. Serious Hypoglycemia: coma, convulsions and altered mental status

Symptoms of hypoglycemia





Step 3: Prevent

- Evaluate for cause of hypoglycemia e.g missed meal, exercise, illness, incorect insulin dose.
- For severe hypoglycemia: evaluate for impaired awareness of hypoglycemia
- Review insulin doses and adjust regimen as per clinical need.

5. CANCER EARLY DETECTION

Cancer early detection

Screening: applying simple tests or procedures across a **healthy population** in order to identify unrecognized cancer disease in individuals **before they develop any symptoms of the cancer**.

Early diagnosis: detection of symptomatic patients as early as possible through the recognition of possible warning signs of cancer in order to take prompt action.

There are three steps to early diagnosis:

Step 1: awareness of cancer symptoms and accessing care;

Step 2: clinical evaluation, diagnosis, and staging; and

Step 3: access to treatment, including pain relief.

Table 9: Common cancer symptoms and signs, per organ system

Site of cancer	Common symptoms	Action for healthcare workers
Breast	Lump in the breast, asymmetry, skin retraction, recent nipple retraction, blood stained nipple discharge, eczematous changes in areola	Refer to a surgeon (who can then arrange imaging and biopsy in consultation with a radiologist)
Cervix	Abnormal vaginal bleeding and/or discharge, pelvic pain (Note: early cervical cancer has no symptoms)	Conduct speculum exam, biopsy and refer to gynaecologic oncologist (biopsy can be performed by a well-trained nurse, clinical officer, medical officer or higher).
Colon and rectum	Change in bowel habits, unexplained weight loss, anaemia, blood in the stool	Refer to the appropriate facility for colonoscopy
Oral cavity	White lesions (leukoplakia) or red lesions (erythroplakia), growth or ulceration in mouth; intraoral swellings	Refer to a dentist/ maxillofacial surgeon
Nasopharynx	Nosebleed, permanent blocked nose, deafness, nodes in upper part of the neck	Refer to ENT specialist
Larynx	Persistent hoarseness of voice	Refer to ENT specialist

Stomach	Upper abdominal pain, recent onset of indigestion, weight loss	Evaluate and refer urgently for oesophageal-gastroduodenoscopy (OGD)
Skin melanoma	Brown lesion that is growing with irregular borders or areas of patchy colouration that may itch or bleed	Refer to a dermatologist; or general surgeon if dermatologist is not available
Other skin cancers	Lesion or sore on skin that does not heal	
Urinary bladder	Pain, frequent and uneasy urination, blood in urine	Refer to a urologist
Prostate	Difficulty (long time) in urination, frequent nocturnal urination	
Testis	Swelling of one testicle (asymmetry)	

[a] These common symptoms may be due to cancer or due to a different medical condition. People with these symptoms should seek medical attention without delay.

(Source: Guide to Cancer Early Diagnosis, WHO, 2017).

Childhood cancer

Findings that may be associated with a cancer diagnosis in childhood

Symptoms and signs which require referral have been suggested in the table below. However, there are many occasions when it is instead a pattern of symptoms and signs that point towards a diagnosis of cancer. Individual features alone are too imprecise Additionally, children often cannot express symptoms clearly, and for this reason, the level of suspicion must necessarily be kept high. Telephone discussion with a paediatrician in cases where the need or timescale for referral is unclear is highly recommended.

AMBER: Concerning features - consider referral or discussion with a paediatrician.

RED: High-risk features - requires immediate referral to Comprehensive Cancer Centre

Table 10: Approach for Assessing A Child For Possible Cancer: Childhood Cancer Assessment Tool

	CONSIDER REFERRAL	REQUIRES REFERRAL
Ear, Nose and Throat; and Oral	• Otorrhoea (persistent/ recurrent otitis externa) • Persistent/recurrent bloody/ purulent discharge from ear/nose • Obstruction of ear/nose	• Swallowing difficulties (in absence of local cause) • Abnormal mass within the nasopharyngeal space Jaw mass
Endocrine	• Polyuria/polydipsia • Delayed/arrested puberty • Abnormal growth	• Precocious puberty • Galactorrhoea
Gastrointestinal	• Constipation not responsive to simple laxatives in appropriate dosage • Abdominal distension	• Persistent vomiting on awakening • Unexplained palpable abdominal mass • Unexplained hepatomegaly
Haematology	• Localised petechiae/ bruising (unexplained) • Bleeding (unexplained) • Pallor • Fatigue (persistent) • Infection (recurrent, persistent or unexplained) • Generalised lymphadenopathy • Generalised bone pain (All should be offered a very urgent FBC and referral to paediatrics considered. Some children with these symptoms will need immediate referral	• Splenomegaly - either in isolation or in association with night sweats, weight loss, pruritus or fever • Widespread petechiae/ bruising

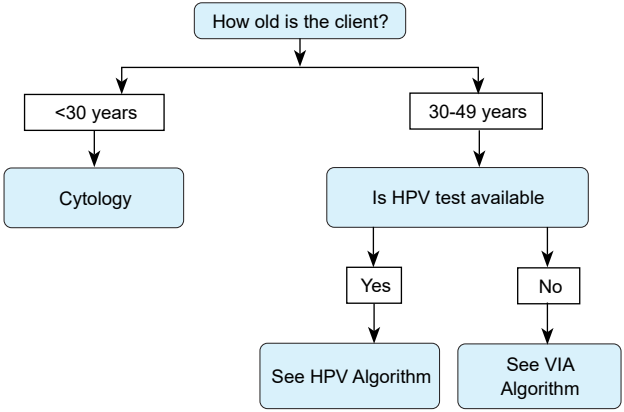
Lymphadenopathy	• Widespread distribution (offer very urgent FBC) • Abnormal consistency (firm or hard) • Non-mobile • Absence of pain	• • Persistent enlarged nodes >2cms for >2 weeks with no decrease in size • Supraclavicular site • Associated splenomegaly, night sweats, weight loss or pruritus • Symptoms/signs of mediastinal mass (facial swelling or edema, difficulty breathing, distended neck veins) • Associated bone pain
Musculoskeletal	• Night pain • Back pain • Pain limiting activities • Pain at rest • Unexplained or persistent generalised bone pain (offer very urgent FBC)	• Unexplained enlarging mass • Soft tissue mass with local lymphadenopathy • Localised unexplained bone pain (consider very urgent x-ray alongside referral) • Ultrasound scan of a mass suggests soft tissue sarcoma or is uncertain and clinical concern persists • X-ray suggests the possibility of bone sarcoma • Limp with fever • Painful scoliosis
Neurology	• Headache with vomiting • Behaviour or personality change • Reducing school performance	• Afebrile seizures • Increasing head circumference across centiles • Headache worse in the morning or waking from sleep • Persistent headache in a child <4years • Abnormal gait • Abnormal coordination • Confusion or disorientation occurring with headache • New bladder or bowel dysfunction • Development regression • Focal motor or sensory abnormalities • Abnormal head position, such as wry neck, head tilt, or stiff neck

Ophthalmology		• Absent red reflex • Proptosis • Abnormal eye movements • Blurred/double vision • Papilloedema • New onset paralytic (nonconcomitant) squint
Renal		• Persistent unexplained microscopic haematuria • Hypertension (>95th centile, or for children aged 13 and over, >130/80) • Frank haematuria • Severe hypertension (>95th centile +12mmHg or >140/90)
Respiratory	• New/changed wheeze/ stridor in absence of typical history for asthma/viral induced wheeze	• New wheeze/stridor with orthopnoea • Difficulty breathing with facial swelling • Mediastinal widening on chest radiograph
Miscellaneous	• Genetic cancer predisposition syndromes • Strong family history of malignancy • Repeated presentation to health professionals • Severe or persistent cradle cap • Unexplained weight loss • Abnormal growth • Blood-stained vaginal discharge• Persistent parental/patient concern or anxiety about symptoms, even if the symptoms are most likely to have a benign cause	• Testicular mass

5.1 Cancer Screening

5.1.1 Cervical cancer

CLINICIAN ALGORITHM FOR CHOICE OF SCREENING TEST



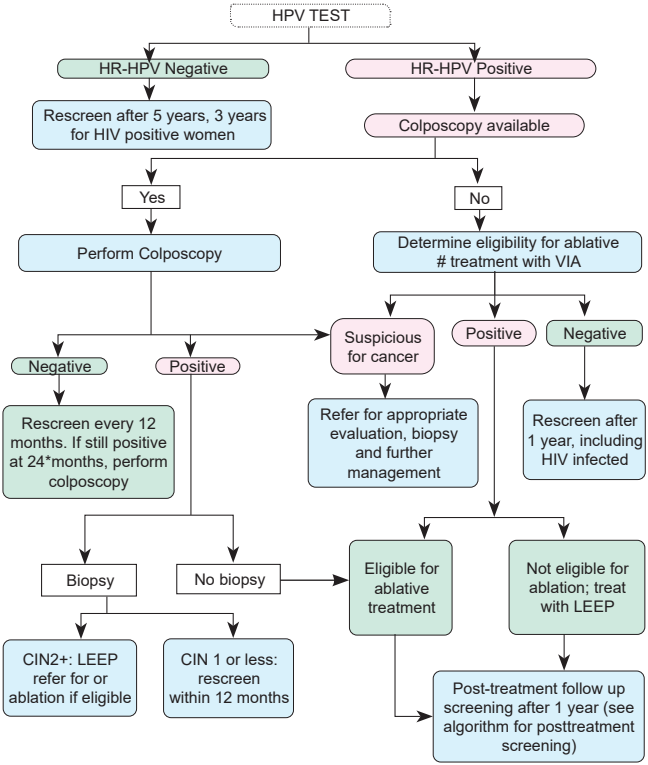
HPV Testing

- HPV testing is the recommended primary screening test for cervical cancer.

Key messages for health care workers

- Clarify that an HPV test is not confirmation of cervical cancer; it is a test to identify women at risk
- HPV is sexually transmitted; however, a current positive test is not a confirmation of partner infidelity (male or female)
- To avoid test result misinterpretation, gender-based violence and proper adherence to post-treatment instructions (e.g., avoidance of coital activity after LEEP/Thermal ablation), encourage partner involvement and engagement in the screening & treatment process

Algorithm for primary screening with HPV test



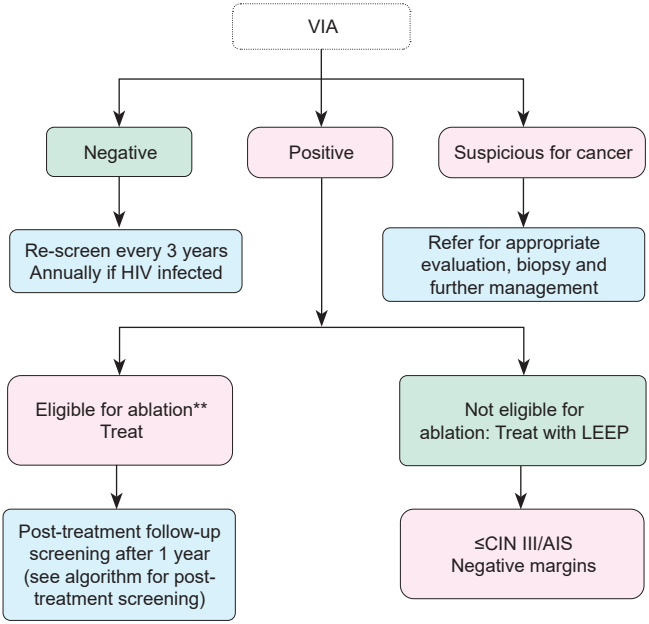
- *Women who test positive for HPV but have no lesion on colposcopy can be re-tested in 12-24 months with an HPV test for clearance and colposcopy repeated depending on resources available and to reduce overtreatment
- #Ablative treatment refers to thermal ablation or cryotherapy

Visual Inspection with Acetic Acid (VIA)

Screening can be done:

- At any point during the menstrual cycle
- Up to 20 weeks during pregnancy
- During a visit for other conditions (such as Family Planning, CCC, MCH, Gynecology clinic).

VIA algorithm (Naked or Enhanced)

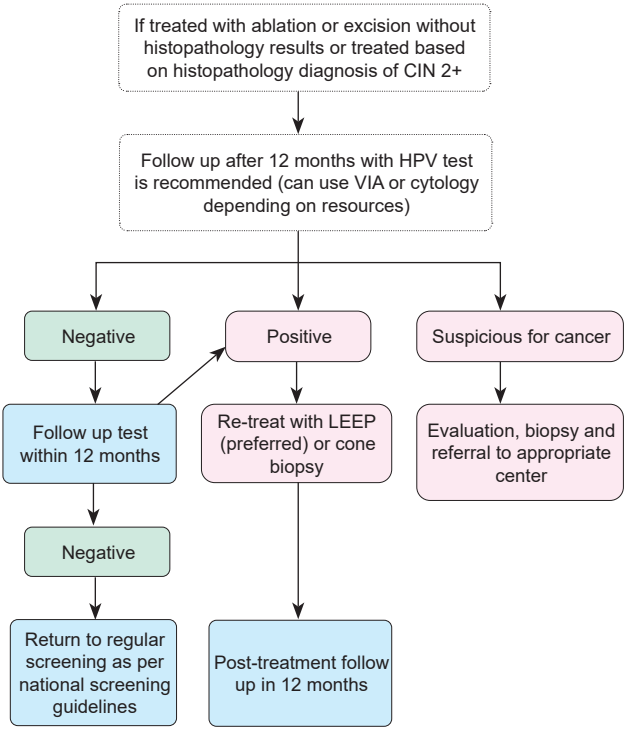


**Ablation includes cryotherapy or thermal ablation

Exclusion Criteria For VIA

- Women who are very ill
- Women who are in 2nd and 3rd trimester of pregnancy
- Women less than 6 weeks after delivery
- Women with a mass suspicious for invasive disease (cauliflower-like growth or ulcer; fungating mass)
- Women with previous history of treatment of cancerous lesions
- Women with known allergy to acetic acid
- Women with a history of total hysterectomy

Algorithm for Post-treatment Follow-up for the General Population of Women



5.2 Breast cancer

Early detection guideline

Age Group	Recommendation	Interval
25 - 34 years	CBE	Every 3 years
35 - 39 years	CBE and Ultrasound	Every 2 years
40 - 55 years	CBE + mammography	Annual
56 - 74 years	CBE + mammography	Every 2 years
75 years and older	Consider individual health factors and woman's preference to continue screening	Discuss with patient

Risk Assessment Algorithm for Breast Cancer

Asymptomatic women

Risk assessment

Average risk
- No personal history of breast cancer
- No family history of breast cancer
- No genetic mutation known to increase risk of breast cancer
- No history of chest radiation therapy before the age of 30

High risk
- Previous abnormal breast biopsy
- Previous breast cancer
- Affected first degree relative
- Generic mutations known to increase risk of breast cancer
- Previous chest wall radiation before the age of 30

- All ages: Breast awareness and education
- 34 years and below: CBE every 2 years
- 35-39 years: CBE and ultrasound. Mammography is not recommended for ages 35-39 years
- 40-55 years: Annual CBE + Mammography
- 56-74 years: Every 2 years
- 75 years and older: Shared decision making

Screening
- 1 or 2 degree relatives with invasive breast cancer: CBE from age 21 years, mammogram +/- MRI/US starting from 10 years earlier than the youngest case in the family, (not earlier than 25 years not later than 40 years of age)
- Previous abnormal breast biopsy (atypia or LCIS): CBE every 6-12 months, mammography annually
- Previous chest wall radiation: Annual mammography/MRI + CBE 5 years post radiation (not earlier than 25 years not later than 40 years of age)

Genetic counselling
- Multiple relatives with breast and / or ovarian cancer, 2 or more generations at least one under the age of 50 years
- Bilateral breast cancer
- Breast cancer at age 35 years or younger
- Triple negative breast cancer at age 60 years or younger
- Primary breast and ovarian cancer in the same individual
- Male breast cancer less than 60 years or first degree relative with breast cancer
- Confirmed BRCA1 or 2 in the family

How to Perform a Monthly Breast Self-Examination

Monthly Breast Exam

The Best time for a breast self-examination is about a week after your period ends, when your breats are not tender and swollen (or the same time each month if you no longer have periods)

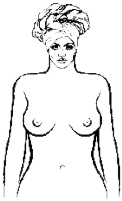
Step 1:

Lying down

Lie on tour back. Place a pillow under left shoulder, and put left hand behind head so your breast is flat.

Use the pads of your three middle fingers to check the breasts. Use your left hand for the right for the left breast.

Use light, medium and firm pressure in a circular motion without lifting your fingers off the skin. Follow an up-and -down pattern. Repeat same steps on right side.



Step 2:

Before a mirror

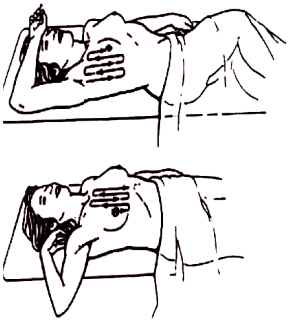
Look for any changes from normal. With arms at your sides, inspect both breasts. Then raise your arms above your head and compare breasts. Now place hands on your hips, flex chest muscles and compare again. Finally, bend forward with hands on hips

Examine the entire area under the collarbone, under your arm, down across your rib cage and up the breastbone. Check for lumps, hard knots, swelling, dimpling or thickening. Look for changes in size, shape or color or for discharge

Step 3

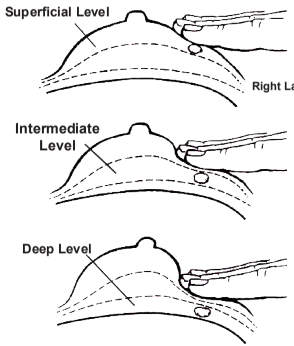
In the shower

Raise your right arm to examine your breast as you would do lying down. Repeat for left breast. Gently feel for abnormal lumps or thickening.

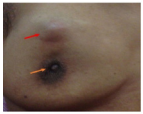
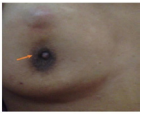
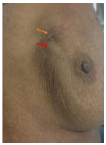
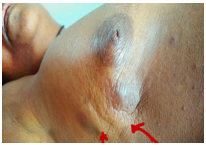
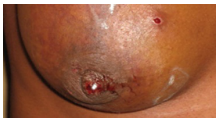
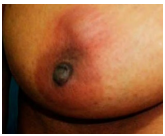
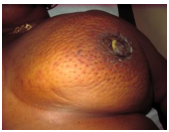
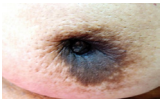
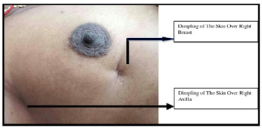


Position the patient in the direction of palpation for the CBE

Make three circles with the finger pads, increasing the level of pressure (subcutaneous, mid-level and down to the chest wall) with each circle



Use the pads of the index, third and fourth fingers (inset) make small circular motions

Breast mass	 
Orange peel appearance	 
Swellings near the armpit or collarbone	 
Nipple discharge	
Inflammatory changes/ rash	 
Nipple retraction	
Skin dimpling	 Figure 1. Pre-Operative Picture.

If any of these symptoms are noted, refer for further management

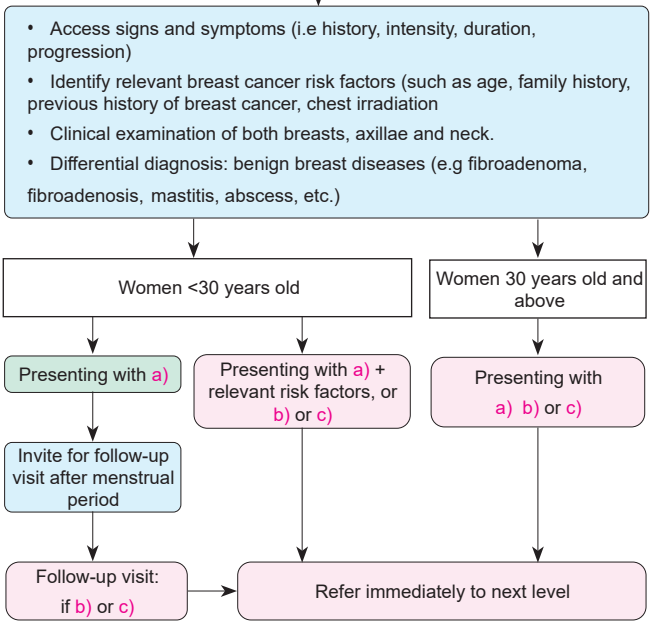
Assessment and Referral of Women with Suspected Breast Cancer at Primary Care Level

Women who present the following persistent and unexplained signs and symptoms should seek consultation at a PHC:

a) Breast lump, or any change in the shape or consistency of the breast

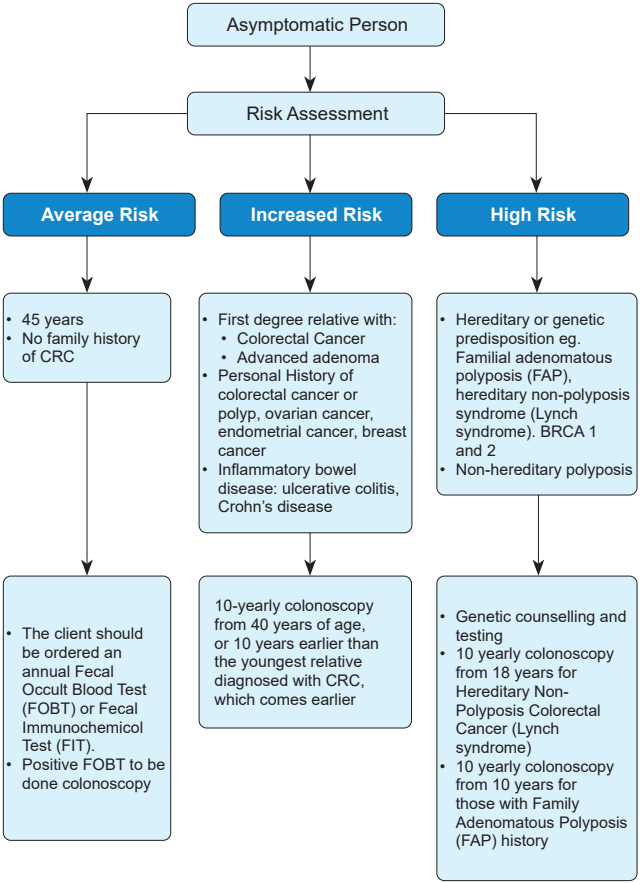
b) Breast lump that enlarges and/or is fixed and hard

c) Other breast problems (i.e eczematous skin changes, nipple retraction, peau d' orange, ulceration, unilateral nipple discharge - particularly bloody discharge -, lump in the axilla) with or without palpable lump

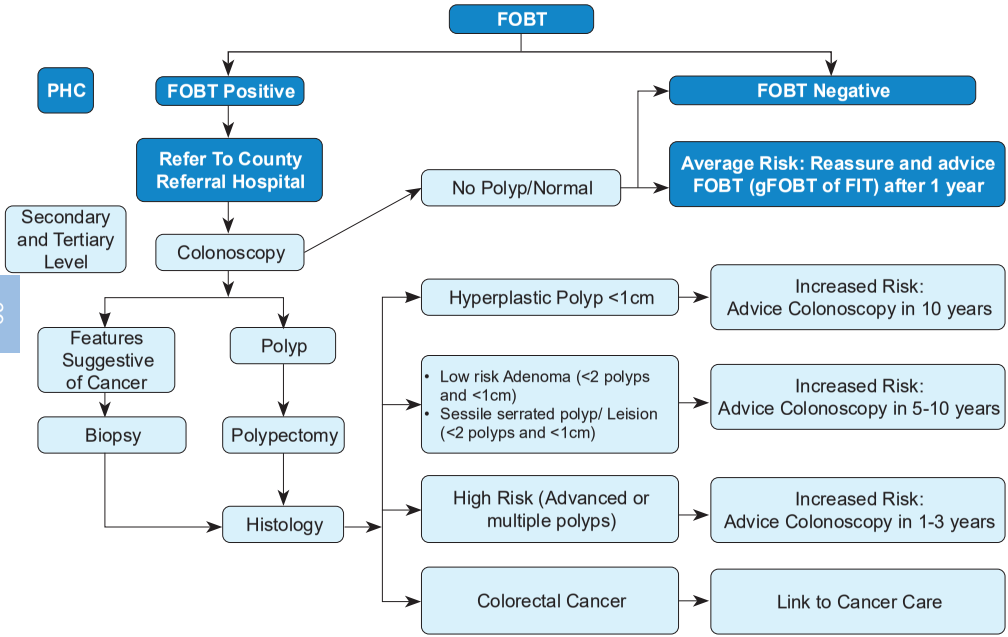


Colorectal cancer (CRC)

Risk Assessment Algorithm



Colorectal Cancer Screening and Early Detection Algorithm



FOBT Restrictions

When FOBT is used to ensure accurate test results, it is essential to adhere to the following dietary and medication restrictions before undergoing a fecal occult blood test (FOBT):

1. Medication Restrictions

a. Nonsteroidal Anti-Inflammatory Drugs (NSAIDs): Avoid NSAIDs such as ibuprofen, naproxen, or aspirin for seven days prior to the test. These medications can cause bleeding, leading to a false-positive result.

Exception: Individuals taking NSAIDs daily for chronic conditions (e.g., heart disease) should consult their healthcare provider before discontinuing the medication for the test.

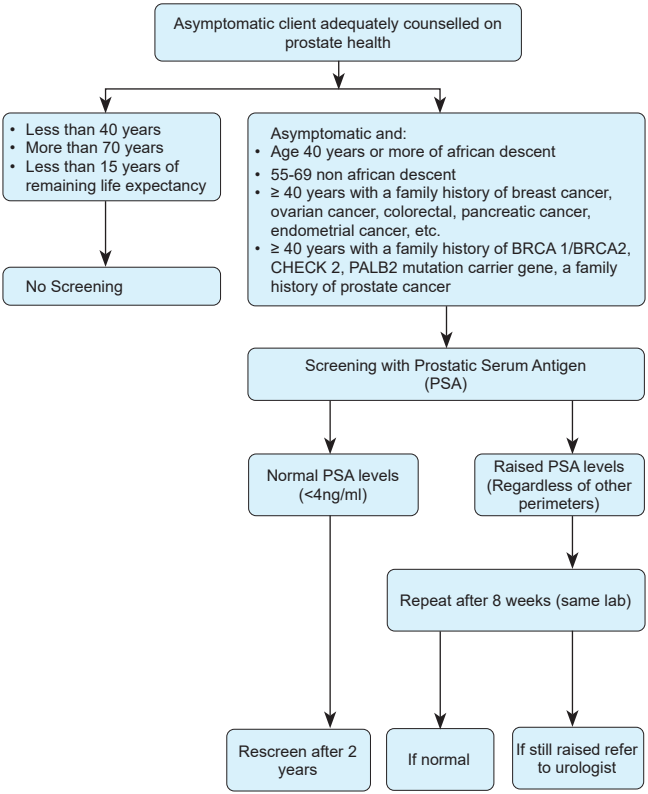
2. Dietary Restrictions

a. Vitamin C: Limit vitamin C intake to less than 250 mg daily from supplements or citrus fruits and juices for three to seven days before the test. Excessive vitamin C can interfere with the test chemicals, resulting in a false-negative result.

b. Red Meat: Avoid consuming red meat (beef, lamb, or liver) for three days prior to the test. Blood components in red meat can cause a false-positive result.

5.4 Prostate Cancer screening

Prostate cancer Screening algorithm



5.5 Management of emergencies in adults with cancer at PHC

Febrile Neutropenia

Cancer patient presenting with fever >38^{0}C after chemotherapy

Do a full hemogram

- Low Risk: Absolute Neutrophil Count (ANC) <1000 (1.0X103/µL)
- High Risk: ANC <500 (0.5X103/µL)

Management (in consultation with the oncology team)

High Risk

- Inpatient Admission
- Isolation
- IV Antibiotics (Aminoglycoside + antipseudomonal penicillin + beta lactamase inhibitor)
- Granulocyte-Colony Stimulating Factor

- Low Risk
- OPD treatment
- Oral antibiotics: Ciprofloxacin or Amoxicillin/Clavulanic acid

Spinal Cord Compression

Diagnostic criteria

Sudden onset back Pain

(+/- Loss of lower limb power, Urine or Stool Incontinence)

Superior Vena Cava Syndrome

- Swollen upper part of body (Face, Neck, Arms)
- Difficulty in breathing

- Pre-referral Management
  - High dose steroids: (I.V/ oral dexamethasone 16 mg stat)
  - Proton Pump Inhibitors: (I.V/oral 40 mg esomeprazole/ omeprazole/ pantoprazole)
  - Oxygen as indicated
  - Analgesics (Opioids)

Referral to cancer center for chemotherapy &/ or Radiotherapy

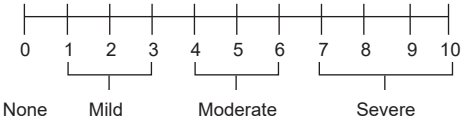
5.6 Palliative care

Palliative care is an approach that improves the quality of life of patients (adults and children) and their families who are facing problems associated with life-threatening illness. It starts from the point of diagnosis and continues with the family even after death of the patient.

Elements of palliative care include:

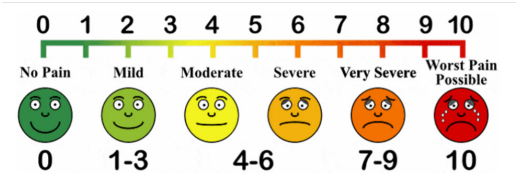
- pain control
- nutrition
- symptom control
- infection prevention and control
- psychosocial care (patient/family)
- spiritual care
- End-of life care (EOLC)

Pain assessment in adults(NUMERICAL PAIN RATING SCALE)



Source: *http://dx.doi.org/10.17245/jdapm.2017.17.4.253*

Pain assessment in adults(NUMERICAL PAIN RATING SCALE)

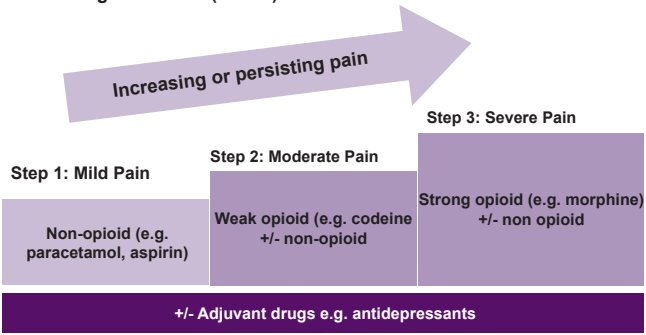


Source: *https://www.disabled-world.com/health/pain/scale.php*

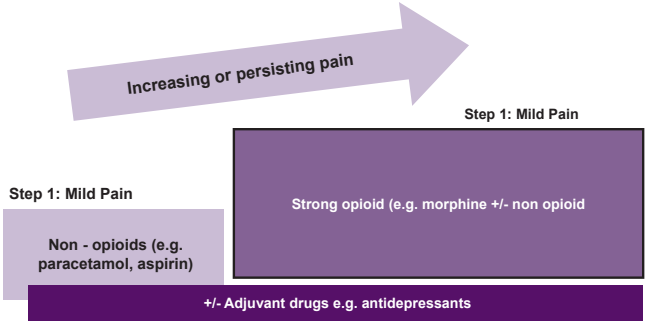
Children<3 years (Use FLACC: Face, Legs, Activity, Cry and Consolability assessment).

	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, right, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaints	Contantly crying, screaming, sobbing or complaining
Consolability	Content, relaxed	Reassured by occasional touching	Difficult to console or comfort

WHO analgesic ladder (adults)



WHO analgesic ladder (children)



NB: step 2 drugs in adult WHO ladder are not used in paediatric age group due to severe side effects. Patients with moderate to severe pain are managed with strong opioids with or without Adjuvants.

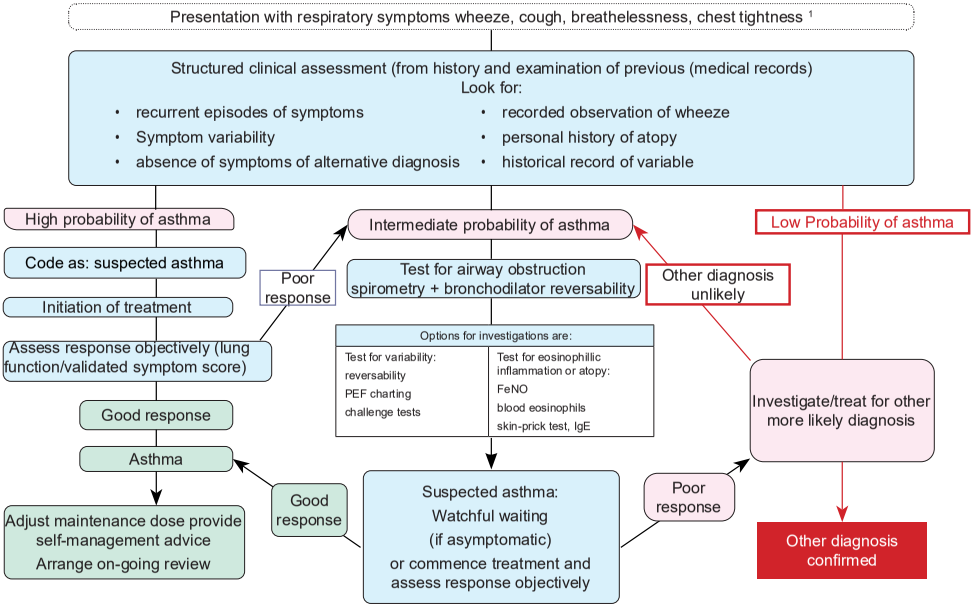
6. 6. ASTHMA

- Asthma is a chronic respiratory non-communicable disease characterized by cough, breathlessness, chest tightness, wheezing and variable expiratory airflow limitation; all of which vary in time and intensity.
- People with asthma often have periods of worsening symptoms called exacerbations (also called “attacks” or “flare-ups”) that can be fatal.

6.1 Asthma diagnosis in children

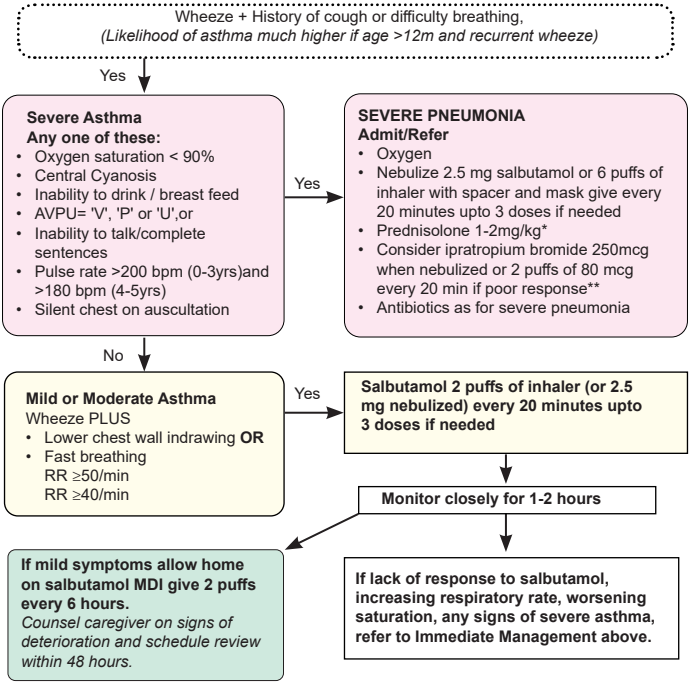
Factors that Increase the Likelihood of Asthma In Children	Factors that Decrease the Likelihood of Asthma
• Frequent episodes of wheeze, cough, chest tightness or heaviness, breathlessness particularly experienced at night and/ or early morning, or triggered by exercise or during playtime, common irritants like dust and perfumes, emotions like laughter or symptoms that also occur in the absence of a ‘common cold’. • Personal history of atopy/allergy conditions like eczema, allergic rhinitis or conjunctivitis, history of reactions to animal proteins like milk, meat, or eggs. • Family history of atopy and or Asthma: siblings, parents, or close relatives. • Reduced play and easily tires during activity and playtime. • Widespread poly-phonic wheeze on chest auscultation during a flare-up. • History of improvement in symptoms or lung function in response to asthma specific therapy.	• Symptoms with ‘colds’ only with no other interval symptoms. • Isolated cough especially when ‘moist’. • Repeatedly normal chest auscultatory findings when symptomatic. • Normal peak expiratory flow especially when symptomatic. • No response to trial of asthma therapy. • Clinical features pointing to an alternative diagnosis e.g., failure to thrive, malnutrition, finger clubbing, sternal anomalies, edema, heart murmurs.

6.2 Asthma diagnosis in older children and adults



[1] In children under 5 years and others unable to undertake spirometry in whom there is a high or intermediate probability of asthma the options are monitored initiation of treatment or watchful waiting according to the assessed probability of asthma.

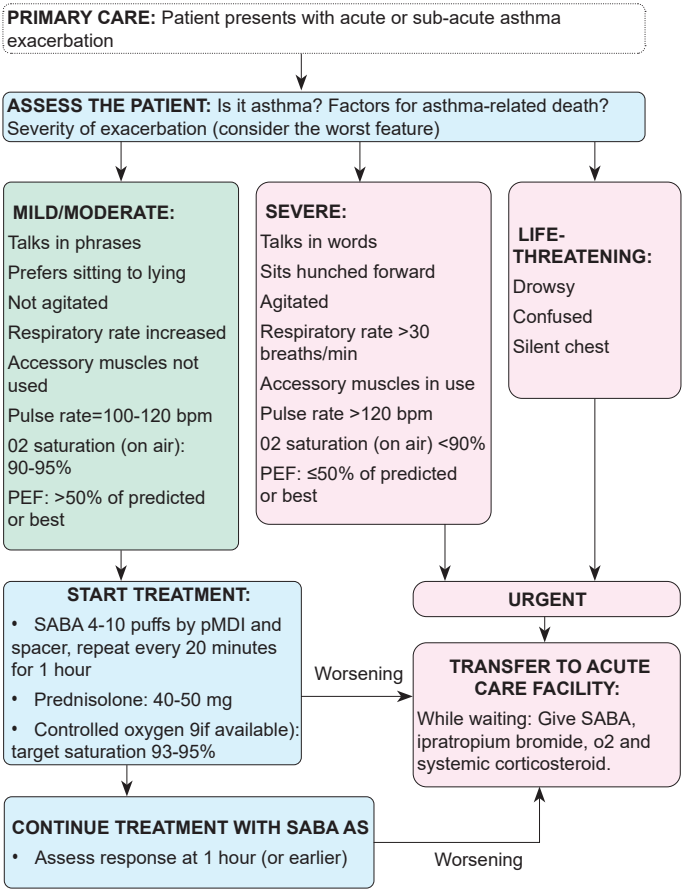
6.3 Acute management of asthma in children under five years



Recurrence of asthma symptoms
Consider Inhaled corticosteroid (ICS) therapy or adjust the doses if already on ICS. ***(Look out for other comorbidities)***
Demonstrate MDI and spacer use to the caregiver before discharge from the health facility. Preferably use spacer with face masks for <3 years for 4-5 years use facemask or mouthpiece. Advise on regular follow up
Prednisolone administered for 3-5 days. Max dose of 20mg/day for < 2 years and 30mg/day for 2-5 years.
** Repeat every 20 minutes for one hour if needed.

(Adopted from the Basic Paediatric Protocols, fifth edition, 2022).

6.4 Management of acute asthma exacerbations/acute asthma in adults, adolescents and children 6-11 years



ASSESS FOR DISCHARGE:

- Symptoms improved, not needing SABA, PEF improving (>60-80% of personal best or predicted), oxygen saturation >94% on room air

ARRANGE AT DISCHARGE

- Continue reliever as needed, start/step-up controller, check inhaler technique and adherence, continue prednisolone for 5-7 days, follow-up after 2-7 days.

FOLLOW-UP:

- Review symptoms/signs: is the exacerbation resolving? Should the prednisolone be continued?
- Reliever: reduce to as needed.
- Controller: continue higher dose for short-term (1-2 weeks) or long-term (3 months), depending on the exacerbation background.
- Risk factors: check and correct modifiable risk factors that may have contributed to the exacerbation, inhaler technique and adherence.
- Refer if >1-2 exacerbations in a year

Adopted from GINA pocket guideline for asthma management, 2022

SABA: short-acting beta agonist (doses are for salbutamol);PEF: Peak Expiratory Flow rate; 02: Oxygen saturation

6.5 Long-term asthma management in children five years and younger

Stepwise Asthma treatment for children aged 5 years and younger

Symptom	Management
STEP 1 **Infrequent wheeze**	As needed inhaled SABA
STEP 2 **≥3 wheezing episodes per year or presence of other asthma**	**Controller:** Daily dose ICS Reliever: inhaled SABA when needed
STEP 3 **Most days or waking with asthma once a week or more**	**Controller options :** Preferred: Double low dose ICS Alternative: Low dose ICS + LTRA Reliever : SABA taken together with the ICS current ICS controller option
STEP 4 **Most days or waking with asthma once a week or more while on double low dose ICS**	Controller options: Continue contorller and refer to specialist Reliever: SABA taken as needed together with the current ICS controller option

Step up or Step down Based on assessment

For all assess: Diagnosis, modifiable risk factors, comorbidities and inhaler technique and adherence

SABA: short-acting beta agonist; ICS: inhaled cortico-steroids; LABA: long-acting beta agonists; LRTA: Leukotriene receptor antagonists.

6.6 Asthma management in children 6-11 years

Stepwise Asthma treatment for children aged 6 - 11 years

Symptoms	Management
STEP 1 **Infrequent**	Controller: Non-pharmacological e.g trigger avoidance Low dose ICS whenever SABA is taken Reliever: as needed inhaled SABA.
STEP 2 **Twice a month or more but not on most days**	**Controller:** Daily dose ICS or Low dose ICS whenever. SABA is taken Reliever: inhaled SABA when needed
STEP 3 **Most days or waking with asthma once a week or more**	**Controller options :** 1. Low dose ICS + LABA 2. Medium dose ICS 3. Low dose ICS + LTRA Reliever: as needed inhaled SABA Refer to specialist
STEP 4 **Most days or waking with asthma once a week or more and low lung function**	**Controller options :** 1. Medium dose ICS + LABA 2. High dose ICS + LABA 3. Add ontiotropium or LRTA 4. High dose ICS Reliever: as needed inhaled SABA Short course OCS as per the criteriain the above section. Refer to specialist

Step up or Step down Based on assessment

For all assess: Diagnosis, modifiable risk factors, comorbidities and inhaler technique and adherence

SABA: short-acting beta agonist; ICS: inhaled cortico-steroids; LABA: long-acting beta agonists; LRTA: Leukotriene receptor antagonists.

6.7 Asthma management in people 12 years and above

Stepwise Asthma treatment for Adults and Children aged 12 years and above

Symptoms	Management
STEP 1 Infrequent symptoms < twice a month	**Controller:** Non-pharmacological, e.g., trigger avoidance **Reliever options**: As needed low dose ICS-Formoterol OR As needed low dose SABA-ICS
STEP 2 Twice a month or more but not on most days	**Controller options:** 1. Non-pharmacological, e.g., trigger avoidance OR 2. Add regular low dose ICS OR **Reliver:** 1. As needed low dose ICS-Formoterol (if not on regular ICS) OR 2. As needed inhaled SABA-ICS if on daily ICS (discouraged if poor adherence to regular ICS)
STEP 3 Most days or waking with asthma once a week or more	**Controller options**: 1. Regular low dose ICS + Formoterol OR 2. Regular low dose ICS+LABA OR **Reliver**: 1. As needed low dose ICS-Formoterol (if on regular ICS + Formoterol) OR 2. As needed inhaled SABA-ICS if on daily ICS+LABA (discouraged if poor adherence to regular ICS+LABA) Refer to a specialist
STEP 4 Most days or waking with asthma once a week or more and low lung function Acute asthma at diagnosis	**Controller options:** 1. Regular medium dose ICS + Formoterol OR 2. Regular medium or high dose ICS+LABA 3. May require short courses of OCS **Reliver**: 1. As needed low dose ICS-Formoterol (if on regular ICS + Formoterol) OR 2. As needed inhaled SABA-ICS if on daily ICS+LABA (discouraged if poor adherence to regular ICS+LABA) Refer to/consult a specialist

Step up or down based on assess-ment

For all assess diagnosis, modifiable risk factors, comorbidities and inhaler and adherence

SABA: short-acting beta agonist; ICS: inhaled cortico-steroids; LABA: long-acting beta agonist; LRTA: Leukotriene receptor antagonists.

Notes:

1. Monotherapy with SABAs is not recommended for the management of asthma.
2. Monotherapy with LABAs is not recommended for the management of asthma and these medications should be used in combination with ICS, mostly as fixed dose inhaler combinations.
3. Inhaled corticosteroids are the cornerstone of managing asthma to achieve control.
4. Oral short-acting bronchodilators, cough mixtures and mucolytics are not recommended for the management of asthma.
5. A spacer device can be used in any age group including adults for those not able to use pressurized metered dose inhalers (pMDIs) directly. They should be prescribed to all children below 12 years, with a facemask for children under 5 years.
6. Example of medications available locally:

Class	Examples
Controller medications	• Beclomethasone inhaler • Budesonide inhaler
Reliever/rescue medications	• Rapid onset but short acting beta 2 agonist (SABA): salbutamol • Rapid and short acting muscarinic antagonist (SAMA): ipratropium bromide
Combinations	• ICS+LABA: Budesonide + Formoterol
	• SABA-ICS: Salbutamol + Beclomethasone (inhalation/aerosol)
	• SABA+ SAMA: Salbutamol + Ipratropium (nebulizer solution)
Add-on medications	• LTRA: montelukast

Using inhalers and spacers

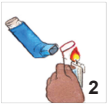
Add a spacer if the patient is unable to use an inhaler correctly to increase drug delivery to the lungs and/or if using corticosteroids to prevent oral thrush.

Make a spacer from a plastic bottle that fits permanently into the inhaler mouth. Prime the spacer initially with 15 puffs of medication. When the medication is finished, replace only the canister.

Clean the spacer weekly, remove the canister and wash spacer with soapy water. Allow it to drip dry. Do not rinse with water after each use. Prime the spacer initially with spacer with two puffs after washing before use.

How to make a spacer from a plastic bottle

- Wash a 500 ml plastic cold-drink bottle with soapy water.
- Leave to air-dry for 12 hours
- Discard the lid



- Wind a steel wire around the open mouth of the inhaler to form a mould.
- Keep some wire for a handle.
- Heat the mould with a flame until it is red hot.

- Apply the hot mould to the bottom end of the bottle for 10 seconds then rotate 180o and reapply until the plastic melts

- Insert mouth of inhaler immediately to create a tight fit. Apply quick-setting glue to seal the inhaler permanently to the spacer

How to use an inhaler with a spacer

- Shake the inhaler and spacer

- Press Pump once and take a deep breath from spacer.
- Do not pump inhaler more than once for each breath

- Breathe out. Then form a seal with lips around the mouthpiece.

- Hold that breath and count up to 10. Then breathe out.
- Rinse mouth after using inhaled corticosteroids.

6.8 Chronic Obstructive Pulmonary Disease (COPD)

Consider COPD in a patient with:

- Dyspnoea that is progressive, persistent and worsens with exercise
- Chronic cough which may be intermittent and productive or not productive
- Chronic sputum production
- Wheezing
- History of exposure to risk factors which may include tobacco smoking, smoke from home
- Cooking and heating biofuels, occupational dusts, and chemicals
- Patient with above symptoms and previously treated for Tuberculosis
- Age of 40 years and above
- Family history of COPD

Is it asthma or COPD?

Consider asthma if:	Consider COPD if:
• Onset before 20 years of age • Associated hay fever, eczema, allergies • Intermittent symptoms, with normal breathing in-between • Symptoms worse at night, early morning, with cold or stress • Personal/family history of asthma	• Onset after 40 years of age • Persistent symptoms, worsening over time • Cough with sputum starts long before difficult on breathing • History of smoking, TB, indoor house pollution • Previous diagnosis of COPD • Spirometry: FEV1/FVC <70%

GROUP A

0 or 1 exacerbation per year, not leading to hospitalization

+

Breathlessness on moderate to strenuous exercise **(dyspnoea grade 0)**; walking hurriedly or walking up a slight hill **(dyspnoea grade 1)**

→ **Bronchodilators**

GROUP B

0 or 1 exacerbation per year, not leading to hospitalization

+

Breathlessness on walking at normal pace on level ground **(dyspnoea grade 2)**, having to stop for breath after walking for a few minutes/100m **(dyspnoea grade 3)** or breathless when dressing/undressing **(dyspnoea grade 4)**

→ **LABA+LAMA**

GROUP E

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization per year

→ **LABA+LAMA; specialist referral**

Non-pharmacological management

Smoking cessation (including pharmacological treatment)

Exercise program and physical activity

Avoidance of aggravating factors

Vaccination; consider Flu, pneumococcal, COVID-19 vaccination

Adequate sleep and health diet

Oxygen: SaO2 at or below 88%, with or without hypercapnia confirmed twice over a three-week period; or r SaO2 of 88%, if there is evidence of pulmonary hypertension, peripheral edema suggesting congestive cardiac failure, or polycythemia (hematocrit > 55%)

7. 7.0 MENTAL HEALTH

7.1 General considerations

Mental Health is a state of Wellbeing in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community

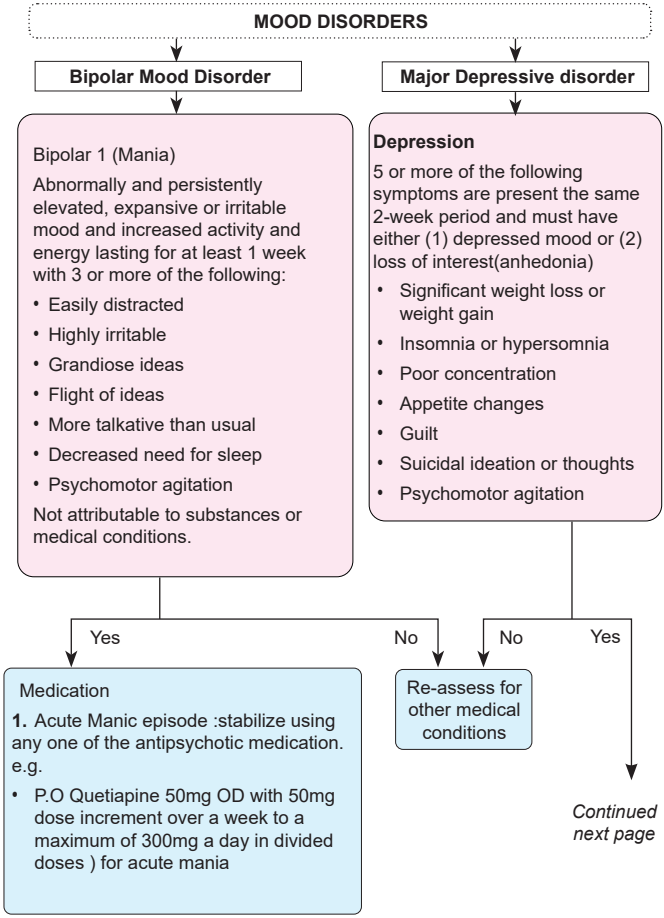
Mental disorder/Mental illness is characterized by a clinically significant disturbance in an individual's cognition, emotional regulation, or behavior. It is usually associated with distress or impairment in important areas of functioning.

Baseline Investigations to be undertaken in management of mental illness:

- Suicide risk assessment
- Baseline labs: FBC, LFT, VDRL, RBS, BS for MPs, HIV, TFT, Pregnancy test
- Toxicology screen when needed
- Imaging (ECG, CT scan, MRI)
- If patient is positive for any of above tests, manage as per medical condition

7.1 MOOD DISORDERS

- These refer to a group of mental disorders that affect the emotional state/ mood of a person as the underlying factor.
- This protocol will focus on Bipolar Mood Disorder and Major Depressive disorder.


MOOD DISORDERS
Bipolar Mood Disorder
Major Depressive disorder
Bipolar 1 (Mania)
Abnormally and persistently elevated, expansive or irritable mood and increased activity and energy lasting for at least 1 week with 3 or more of the following:
• Easily distracted
• Highly irritable
• Grandiose ideas
• Flight of ideas
• More talkative than usual
• Decreased need for sleep
• Psychomotor agitation
Not attributable to substances or medical conditions.
Depression
5 or more of the following symptoms are present the same 2-week period and must have either (1) depressed mood or (2) loss of interest(anhedonia)
• Significant weight loss or weight gain
• Insomnia or hypersomnia
• Poor concentration
• Appetite changes
• Guilt
• Suicidal ideation or thoughts
• Psychomotor agitation
Yes
No
No
Yes
Medication
1. Acute Manic episode :stabilize using any one of the antipsychotic medication. e.g.
• P.O Quetiapine 50mg OD with 50mg dose increment over a week to a maximum of 300mg a day in divided doses) for acute mania
Re-assess for other medical conditions
Continued next page

Medication - Continued

- P.O Risperidone 2mg OD can be gradually increased to a maximum dose of 4mg in a day
- P.O Olanzapine 5mg OD can be gradually increased to 10mg in a day
- When stable, add Psychotherapy as part of maintenance treatment

2. Mood stabilizers: Choose any of the following

- P.O carbamazepine 200mg OD with a maximum of 800mg in a day in divided doses
- P.O Sodium valproate 200mg with a maximum of 1000mg in a day
- **NB:**

Carbamazepine and Sodium Valproate: Due to risk of teratogenicity avoid in women or advice on birth control before initiating.

- Issue PHQ9 form to assess severity of depression (Table 11 on page 82.)
- Treat as outlined below (page 93)
- Refer patient to mental health specialist for review and follow up after starting the medication

Table 11: Screening for Depressive Disorders: PHQ9 Assessment Tool

Over the last 2 weeks, how often have you been bothered by any of the following problems? Not at all Several days More than half the days Nearly every day (use "" to indicate your answer)	Not at all days	Several days	More than half the days	Nearly all days
Little interest or pleasure in doing things	0	1	2	3
Feeling down, depressed, or hopeless.	0	1	2	3
Trouble falling or staying asleep, or sleeping too much	0	1	2	3
Feeling tired or having little energy	0	1	2	3
Poor appetite or overeating 0 1 2 3	0	1	2	3
Feeling bad about yourself or that you are a failure or have let yourself or your family down 6. 0 1 2 3	0	1	2	3
Trouble concentrating on things, such as reading the newspaper or watching television 7. 0 1 2 3	0	1	2	3
Moving or speaking so slowly that other people could have noticed. Or the opposite being so figety or restless that you have been moving around a lot more than usual 8. 0 1 2 3	0	1	2	3
Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3

Add Columns

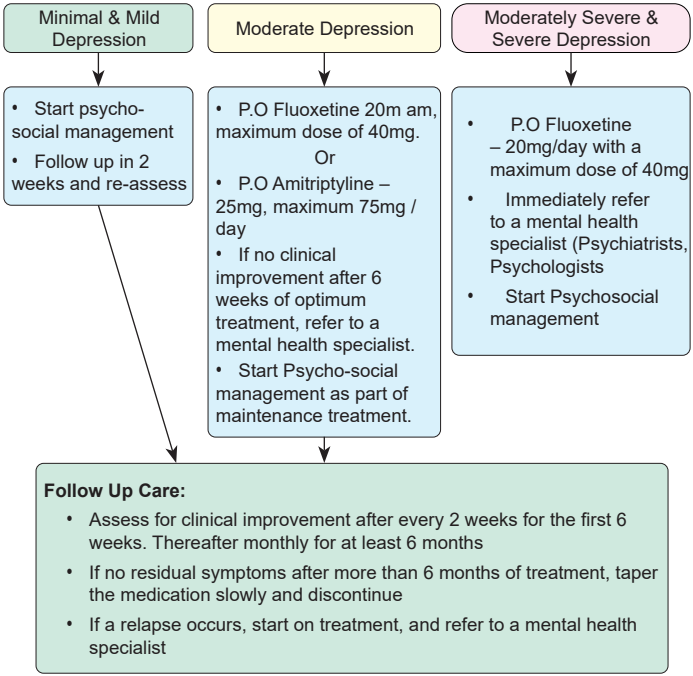
Total:

	+		+	

Classification of Depression:

Total Score	Depression Severity
1-4	Minimal depression
5-9	Mild Depression
10-14	Moderate Depression
15-19	Moderately Severe Depression
20-27	Severe Depression

DEPRESSION: TREATMENT



Notes:

- Serotonin Selective Receptor inhibitors (SSRIs) e.g Fluoxetine should be used with caution in adolescents and young adults. SSRIs can cause suicidal ideations. If these develop, switch to a different class of antidepressants.
- Use Tricyclic Antidepressants (TCAs) e.g Amitriptyline with caution for patients with existing cardiac problems. A baseline ECG should be taken at diagnosis
- All patients on antidepressants should be monitored for suicidal ideations

7.2 SUBSTANCE USE DISORDER (SUD)

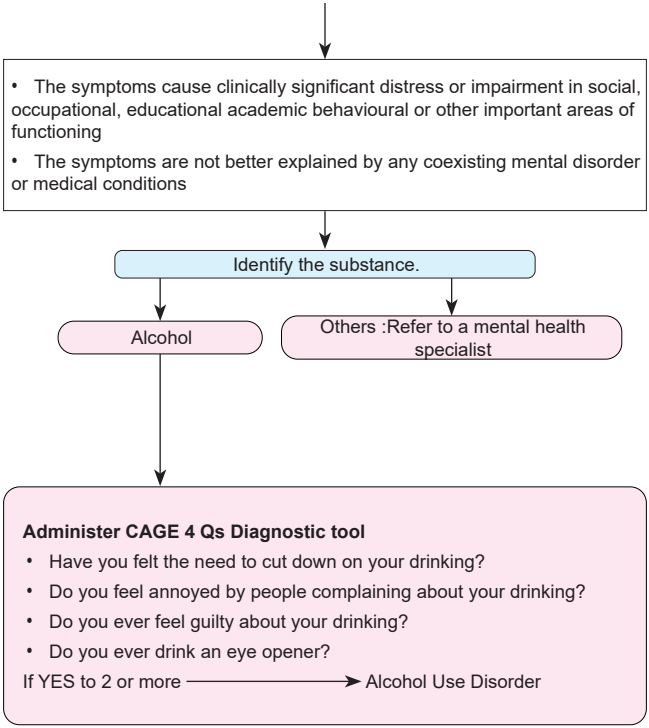
- Substance abuse refers to the harmful or hazardous use of psychoactive substances.
- Disorders due to substance use include disorders that result from a single occasion or repeated use of substances that have psychoactive properties, including certain medications.

Diagnostic criteria

The following is the diagnostic criteria used to diagnose a substance use disorder

A: At Least two of the symptoms listed below in a 12-month period:

- Using more of a substance than planned or using a substance for a longer interval than desired
- Inability to cut down despite desire to do so
- Spending substantial amount of the day obtaining, using or recovering from substance use
- Cravings or intense urges to use a substance.
- Repeated usage causes or contributes to an inability to meet important social or professional obligations.
- Persistent usage despite the user's knowledge that it is causing frequent problems at work or family level
- Giving up or cutting back on important social, professional, or leisure activities because of use
- Using in physically hazardous situations, or usage causing physical or mental harm
- Persistent use despite the user's awareness that the substance is causing or at least worsening a physical or mental problem
- Tolerance development: Need to use increasing amounts of a substance to obtain its desired effects
- Presence of withdrawal effects: A characteristic group of symptoms that emerge as the substance concentration in the body decreases


• The symptoms cause clinically significant distress or impairment in social, occupational, educational academic behavioural or other important areas of functioning
• The symptoms are not better explained by any coexisting mental disorder or medical conditions
Identify the substance.
Alcohol
Others :Refer to a mental health specialist
Administer CAGE 4 Qs Diagnostic tool
• Have you felt the need to cut down on your drinking?
• Do you feel annoyed by people complaining about your drinking?
• Do you ever feel guilty about your drinking?
• Do you ever drink an eye opener?
If YES to 2 or more
Alcohol Use Disorder

7.3 Treatment of Alcohol Use Disorder

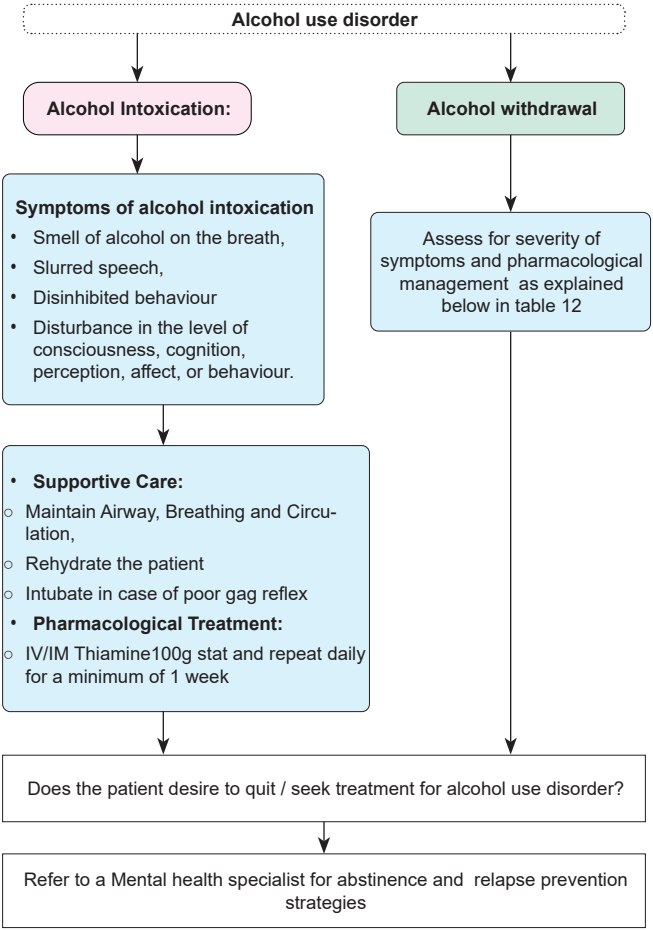
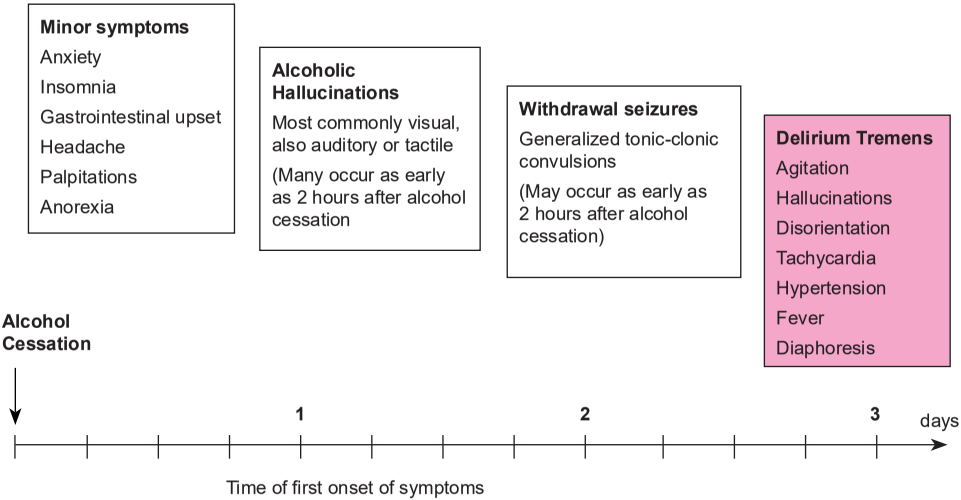


Table 12: The severity of symptoms of Alcohol withdrawal



Pharmacological Management of Mild to moderate Alcohol Withdrawal

Medication	Dosage
Benzodiazepines: Diazepam: Lorazepam	Tapered dose over 7 to 10 days: • 10-20mgs QID for 3 days • 10-20 mgs TID for 3 days • 10- 20 mgs BD for 2 days • 10-20mgs nocte for 2 days. 100mgs stat then 100mgs every 12 hours for 5 days then 100mgs every other day for 2 days.
Thiamine	IV 100mg Thiamine in 100mls dextrose on alternate days for 5 days Oral thiamine given 100mgs once daily for at least 1 month
Haloperidol Atypical antipsychotics such as: Olanzapine Risperidone	Single dose of 2.5-5mg (up to 10mg daily) P.O or I.M, repeated every 4-8 hours. 5-10mg OD 1-4mg OD
Carbamazepine	P.O 200mg TDS
Propranolol (β-blockers)	40mg P.O PRN
or	
Clonidine (alpha blocker)	0.1-0.2mg P.O given every 2-4 hours

Table 13: Management of Severe Alcohol Withdrawal -Delirium Tremens

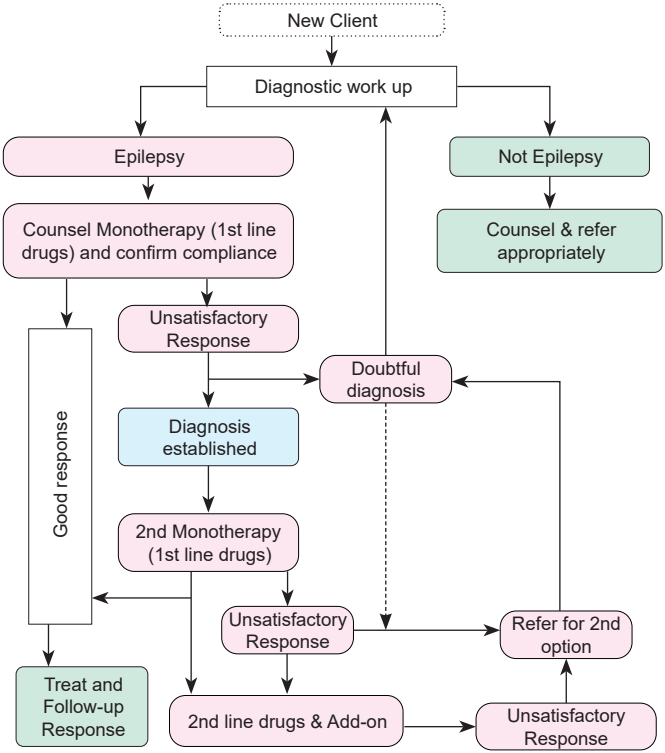
Management of Severe Alcohol withdrawal -Delirium Tremens (DT)

- Treat preferably in an ICU setting.
- Nurse in a quiet environment
- Rehydration with intravenous fluids: Intravascular volume must be maintained with IV fluids,
- IV /IM Thiamine 100mg or PO daily if unable to access parenteral medication.
- Benzodiazepines:
  - IV diazepam 5-10mg every 5-10 minutes until sedation is achieved or
  - IV Lorazepam 2-4 mg every 15-20 minutes or
  - Oral Chlordiazepoxide 25-100mg repeated hourly.

8. DIAGNOSIS AND MANAGEMENT OF EPILEPSY

8.1 Diagnosis of Epilepsy

The Diagnosis of Epilepsy is Primarily Clinical and Based on History and Observation



Criteria for Referral:

Patients should be referred to the secondary/tertiary level of care for appropriate management if there is:

- Failure to make a satisfactory diagnosis at primary level
- Failure to respond to adequate treatment
- Evidence of complications or focal neurological deficit and drug reactions
- Pregnancy
- Breakthrough seizures
- Co-morbidity.
- Epilepsy with heavy genetic links
- Recurrent febrile seizures .

Table 14: Seizure precipitating factors

Some common Seizure Precipitating factors	
Flashing lights	When watching TV, sit in a well-lit room and as far as possible from the TV screen
Alcohol and substance abuse	Avoid alcohol and other intoxicating drug
Hypoglycaemia	Do not skip meals, eat at regular times
Physical stress	Understand your individual body limits and do not exceed them. Regular physical exercise may be beneficial.
Mental stress	Stress cannot always be avoided but should be minimised wherever possible. Seek counselling to help you cope with Epilepsy.
Sleep deprivation	Sleep adequately (6-8 hours each night)
Systemic illness	Should be treated promptly

Table 15: Differentiation between epileptic and psychogenic "seizures"

	Epileptic "seizure"	Psychogenic "seizure"
Precipitating Circumstances	Generally unprovoked	Usual (emotion, pain)
In sleep	Common	Rare
When alone	Common	Less common (mostly occurs in the presence of observer(s))
Prodrome	Rare	Common
Onset	Sudden or aura	Gradual
Cry at onset	Common	Uncommon
Vocalization	During automatism only	Groans and moans or cries usually throughout fit
Motor phenomena	Stereotyped, usually both tonic and clonic, Clonic movements slow as seizure continues and increase in amplitude	Prolonged and unusual movements e.g., pelvic thrusting
Injury	Common	Rare
Incontinence	Common	Rare
Tongue-biting	Common	Rare
Consciousness	Lost in GTCS, reduced in CPS	Usually not lost. May not respond
Resistance to passive limb movement or eye opening	Unusual	Common
Termination of attack	Usually rapid; confusion, drowsiness or sleep common	Gradual, often with emotional display; confusion, drowsiness, or unusual sleep
Recall of seizure events	Very rare	Possible or may be elicited by hypnotic recall

Table 16: Differentiation between epileptic seizures and fainting attacks (reflex syncope)

	Epileptic seizure	Syncope
Circumstances	Could happen anywhere	Usually happens in upright position in crowded, hot surroundings or in emotionally stressful situations
Onset	Sudden or aura	Gradual
Motor phenomena	Tonic or tonic-clonic movements with characteristic amplitude and frequency	Flaccid May be uncoordinated clonic jerks of low amplitude
Skin colour	Pale or flushed	Pale
Respiration	Stertorous, foaming	Shallow, slow
Incontinence	Common	Rare
Tongue-biting	Common	Rare
Vomiting	Unusual	Often
Injury	Common	Rare
Post-ictal	Drowsy, confusion, sleep	Usually, rapid recovery without confusion
Duration	Minutes	Seconds

8.2 MANAGEMENT OF EPILEPSY

Acute management: first aid for a convulsing patient

Figure 1: The recovery position

DO's

- If unconscious, place in recovery position
- Move patient away from dangerous situations such as fire, traffic, water etc
- Take away any objects that could harm the patient
- Loosen tight clothes, remove glasses
- Protect the head using something soft
- Turn patient on his or her side, so that saliva and mucus can drain out of the mouth
- Remain with the patient until he or she regains consciousness fully
- Then let the patient rest and guide them to a safe place and contact their caregivers / guardians.

DONT'S

- Do NOT put anything into the mouth
- Do NOT give anything to drink
- Do NOT try to stop the jerking or restrain the movements.

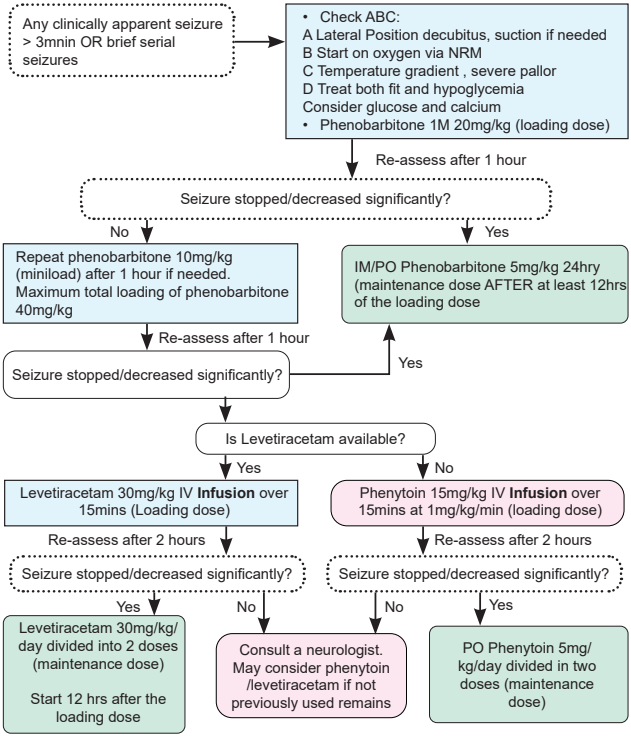
8.3 Management of status epilepticus in adults

Emergency treatment of status			
Step	Time		
1	0 min	ABC Turn patient onto their side High-flow oxygen Check blood glucose Check cardiorespiratory function Establish i.v. access	Confirm epileptic seizure clinically
2	<5 min	Midazolam 0.5 mg/kg (usually10mg) - buccal Or lorazepam 0.1 mg/kg (4 mg) - i.v. Or diazepam 0.2 - 0.5 mg/kg (10-20 mg) - rectal Repeat loading dose if necessary after 10 minutes (maximum one repeat) Give 50% glucose 50 ml or thiamine 100mg i.v (or Pabrinex) if required	Midazolam available out of hospital Call for senior help
3	5-15 min	Phenytoin 15 -20 mg/kg i.v. over 20 minutes Or fosphenytoin 15 - 20 mg/kg i.v. Or Phenobarbital 20mg/kg i.v. over 5 minutes Or levetiracetam 20 - 60mg/kg i.v. over 15 minutes sodium valproate 20 - 40	KU in attendance

4	>30 min	Rapid sequence induction of anaesthesia thiopental sodium 4mg/kg i.v. Or propofol 2mg/kg i.v. loading dose then 2-5 mg/kg/hour Or Midazolam 0.2 mg/kg i.v. loading dose then 0.2 - 0.6 mg/kg/hour	Transfer to ICU Access underlying cause
Treat in a stepwise manner, Times vary depending on guideline used. ABC, Airway, Breathing, Circulation management as per adult life support, ICU, intensive care unit, i.v. Intravenous			

Source: Harris L, Angus-Leppan H, Epilepsy: diagnosis, classification and management, Medicine, https://doi.org/10.1016/ j.mpmed.2020.05.001

8.4 Management of convulsions in children <1month



WHEN TO STOP ANTICONVULSANTS:

- In neonates with neurological examination and/or normal electroencephalography, consider stopping antiepileptic drugs if neonate has been seizures-free for more than 72hrs; the drug(s) should be reinstituted in case of reoccurence of seizures.
- In neonates in whom seizure control is achieved with a single antiepileptic drug, the drug can be discontinued abruptly without tapering of the doses.
- In neonates requiring more than one antiepileptic drug for seizure control, the drugs may be stopped one by one, with phenobarbital being the last drug to be withdrawn.

Source: Basic Paediatric Protocols, 2022

8.6 Management of convulsions in children >1 month

Child convulsing

Ensure safety and check ABCD
A - Place in lateral position, suction if indicated
B - Start on oxygen via NRM
C - Check for temp gradient, severe pallor
D - Check RBS or give 5mls/kg of 10% Dextrose

Convulsion lasting > 5min?

(If children have up to 2 fits lasting <5mins, they **DO NOT** require emergency drug treatment)

Yes

- Give IV Diazepam 0.3mg/kg slowly over 1minute OR rectal diazepam 0.5mg/kg

  Alternatives include *IV Lorazepam or buccal midazolam (dosages in the formulary)*
- Check ABCD when convulsion stops, observe and investigate cause / refer appropriately

No

Child having 3rd convulsion lasting

<5 mins in <2 hrs (short multiple

convulsions).

Yes

Convulsion continues 5mins after first dose of diazepam

- Give the second dose of IV diazepam 0.3 mg/kg slowly over 1 minute, OR rectal diazepam 0.5 mg/kg
- Continue oxygen
- Check airway and breathing when convulsion stops, investigate & treat cause / refer appropriately

Convulsion continues 5mins after second dose of diazepam

- Give IM phenobarbitone 15mg/kg (loading dose)
- Initiate maintenance therapy with phenobarbitone 2.5 mg/kg OD for 48 hrs then review
- Continue oxygen during active seizure
- Check ABC when convulsion stops and investigate and treat cause / refer appropriately

- DO NOT give more than 2 doses of diazepam in 24hrs once phenobarbitone is used
- DO NOT give a phenobarbitone-loading dose to an epileptic on maintenance phenobarbitone
- Phenytoin, levetiracetam and IV sodium valproate (see doses in the formulary) are alternatives to phenobarbitone.

Table 17: Choice of AEDs in adults and children based on seizure type

ANTI EPILEPTIC DRUGS OF CHOICE BY TYPE OF SEIZURES			
		Adults	**Children**
PARTIAL SEIZURES	**Focal Seizures** (Activity or uncontrolled sensation when the person is alert)	Phenytoin • Carbamazepine • Phenobarbitone • Sodium Valproate	Carbamazepine • Sodium Valproate
	Dyscognitive Focal Seizures (Activity with change in consciousness >15-30 sec).	Phenytoin • Carbamazepine • Phenobarbitone • Sodium Valproate	Carbamazepine • Sodium Valproate
	Bilaterally Evolved Seizures (Activity begins in one area and spreads in whole brain)	Phenytoin • Carbamazepine • Phenobarbitone • Sodium Valproate	Carbamazepine • Sodium Valproate • Lamotrigine

GENERALIZED SEIZURES	**Tonic Clonic** (Stiffening, falling, followed by a convulsion)	Phenobarbitone • Phenytoin • Carbamazepine • Sodium Valproate	Phenobarbitone • Sodium Valproate
	Absence (Staring and blinking, >15 Seconds)	• Sodium Valproate • Ethosuximide • Benzodiazepines	Sodium Valproate • Ethosuximide • Benzodiazepines
	Tonic (Stiffening, falling, no convulsion)	Phenobarbitone • Phenytoin • Carbamazepine • Sodium Valproate	• Phenobarbitone • Sodium Valproate • Carbamazepine Lamotrigine
	Myoclonic Jerks (Short jerking movement of parts of the body, <1 sec)	Phenobarbitone • Sodium Valproate • Benzodiazepines	• Phenobarbitone • Sodium Valproate
	Clonic (Falling and jerking with no stiffening)	Phenobarbitone • Phenytoin • Carbamazepine • Sodium Valproate	Phenobarbitone • Sodium Valproate • Carbamazepine
	Atonic (Falling, limply to the ground)	Phenytoin • Sodium Valproate	Phenobarbitone • Sodium Valproate

Drug	Adult - Starting Dose	Increment	Maintenance	Dosing	Dose Preps
Phenobarbitone	Under 1 yr 15-30 mg/day 1-5yrs: 30-60 mg/day 6-12yrs: 30-90mg/day 12 and above: 60-90 mg/day	30mg 4wkly	2-5 mg/kg/day Adults: maximum180mg/day	BD for children OD for Adults	Tabs:30mg
Phenytoin	Adults: 200mg/day	Adults 100mg wkly	3-5mg /kg/day Adults: maximum 400mg/da	OD or BD	Tabs: 50mg, 100mg, Caps: 50mg, 100mg Syr:30mg/5mls
Carbamazepine	Under 1 year. 100mg/day 1-5yrs: 150mg/day 6-11yrs: 200mg/day 12 and above: 400mg/day	4wkly Adult: 200mg 4wkly	Child: 10-20mg/kg/day	BD monotherapy	Tabs 100mg, 200mg, syrup:100ml
			Adults: 10-20mg/kg/day (1400mg)	TDS polypharmacy	
Valproate	Under 1yr: 100mg/day 1-5yrs: 150mg/day 6-11yrs: 400mg/day 12yrs and above: 400-600mg/day	Adult: 200mg/ 4weeks	Child: 10-30mg/kg/ Day Adults: 10-20mg/kg/ day Maximum 2400mg	OD, BD,TDS	Tabs: 150mg, 200mg, 300mg, 500mg Syrup: 200mg/5ml IV: 400mg
Clonazepam	Under 1yr 0.125mg/day 1-5yrs: 0.25mg/day 6-15yrs: 0.5mg/day Adults 1mg/day	Adult: 1mg wkly	Under 1yr 0.5-1mg/day Child:-6mg/day Adults: 4-8mg/day	BD or TDS	Tabs: 0.5mg, 2mg,

Sodium Valproate is contraindicated in pregnant women and should not be initiated during pregnancy

Sodium valproate be used for management of epilepsy where the care provider is unable to correctly diagnose the type of seizure; however, making the correct diagnosis remains of critical importance

Caution should be exercised when utilizing Phenytoin as maintenance therapy.

All women of child-bearing age should be on folic acid in addition to their anti-epileptic drugs

Start with monotherapy, at lowest dose, titrate at 2-6 weeks intervals, till seizure control/tolerance limit. If no control at maximum dose, start a second drug with different mechanism of action gradually. If no control with two drugs at optimal doses, refer for further evaluation.

If seizure free for three years, drug withdrawal can be considered, based on type of epilepsy, patient views and specialist advice.

Managing febrile seizures

1 Is this a febrile seizure?

Definition:

- ✓ Childhood seizure
- ✓ After one month of age
- ✓ Child has febrile illness
- ✗ No CNS infection
- ✗ No previous neonatal or unprovoked seizures
- ✗ Doesn't meet criteria for other acute symptomatic seizures

—International League Against Epilepsy

Seizure types:

Simple	Complex	Febrile status epilepticus
Less than 15 mins	More than 15 mins	More than 30 mins
Generalised	Focal	
No recurrence within 24 hours	May have repetitive seizures	
No postictal pathology	Todd's paresis may be present	

2 Consider alternative diagnoses

Beware an alternative diagnosis, especially if the fever is less than 38°C, or in infants younger than 6 months. Causes could include CNS infections or other causes of fever.

Red flags suggestive of CNS infection:

- Antibiotic treatment
- Complex febrile seizures
- History of irritability, decreased feeding or lethargy

Incomplete immunisation:

- *Haemophilus influenzae B*
- *Streptococcus pneumoniae*

Postictal symptoms lasting more than 1 hour

- Limited social response
- Altered consciousness
- Neurological deficit
- Drowsiness

Any physical signs of meningitis/encephalitis

- Bulging fontanelle
- Focal neurological signs
- Neck stiffness
- Photophobia

⚠ Symptoms and signs of meningeal irritation may be absent in children under 2 years of age.

3 Educate and inform parents

Recurrence:

Overall recurrence is thought to be about 1 in 3. Parents can be reassured that recurrence is rare in children with no risk factors.

Risk factors

- ✗ Age at onset under 18 months ✓
- ✗ Fever less than 39°C ✓
- ✗ First degree relative has history of febrile seizure ✓
- ✗ Shorter duration of fever before seizure (<1 hour) ✓
- ✗ Multiple seizures during the same febrile illness ✓
- ✗ Day nursery attendance ✓

Epilepsy

Most children with FS do not develop an epilepsy.

Risk factors

- ✓ Family history of epilepsy
- ✓ Complex febrile seizure
- ✓ Neurodevelopmental impairment

Having all three risk factors increases risk of epilepsy to 50%.

Children with no risk factors

4 in 100 chance of further seizures

Children with all risk factors

80 in 100 chance of further seizures

Cognitive impairment

A single simple febrile seizure poses no threat to a child's cognitive development.

Advice for Parents

During seizure
- ✓ Protect child from injury
- ✗ Do not restrain child
- ✗ Do not put anything in their mouth

If seizure ends within 5 minutes
- ✓ Check airway
- ✓ Place child in recovery position
- ✓ Explain that the child may be sleepy for up to an hour
- ✓ Seek medical advice

If seizure continues longer than 5 minutes
- ✓ Call an ambulance
- ✓ Administer rescue treatment

Rescue medications

For children with high risk of recurrence, parents should be provided with benzodiazepines (midazolam or rectal diazepam) on discharge.

References

1. Kenya National Guidelines for Cardiovascular Diseases Management; 2024
2. Guide to cancer early diagnosis. Geneva: World Health Organization; 2017. Licence: CC¬BY-NC-SA-3.0 ¬IGO.
3. Diagnosis and management of type 2 diabetes (HEARTS-D). Geneva]: World Health Organization; 2020 (WHO/UCN/NCD/20.1). Licence: CC BY-NC-SA 3.0 IGO.
4. WHO package of essential noncommunicable (PEN) disease interventions for primary health care. Geneva: World Health Organization; 2020. Licence: CC BY-NC-SA 3.0 IGO.
5. Guideline for the pharmacological treatment of hypertension in adults. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO.
6. National Clinical Guidelines for Management of Diabetes; 2024
7. National Sickle Cell Management Guidelines; 2021
8. National Cancer Screening and Early Diagnosis Guidelines, Second Edition, 2024
9. National Palliative Care Guidelines, 2013
10. National Asthma Management Guidelines 2021
11. Pocket Guide to COPD Diagnosis, Management, and Prevention: A Guide for Health Care Professionals; 2023 Edition
12. National Mental Health Standards and Clinical Guidelines, 2024
13. Kenya National Guidelines for The Management of Epilepsy: A Practical Guide for Healthcare Workers
14. Patel N, Ram D, Swiderska N, Mewasingh LD, Newton RW, Offringa M. Febrile seizures. BMJ. 2015 Aug 18;351:h4240. doi: 10.1136/bmj.h4240. PMID: 26286537.
15. Botswana Primary Care Guideline for Adults, 2017

Annex 1:

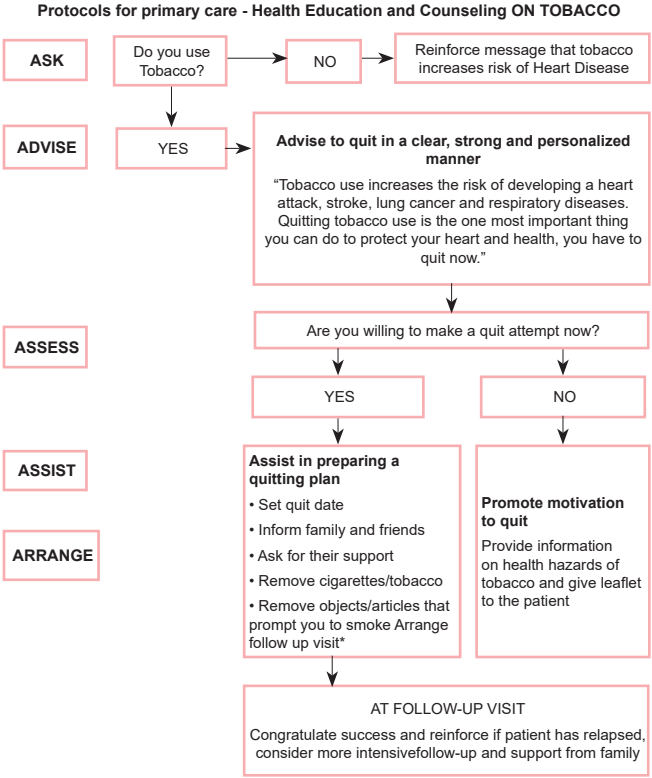
List of drugs for management of priority NCDs at primary care

Condition	Medications		
Hypertension	Amlodipine Felodipine Nifedipine Chlorthalidone Hydrochlorothiazide (HCTZ) Indapamide	Captopril Enalapril Lisinopril Perindopril Ramipril	Candesartan Irbesartan Losartan Telmisartan Valsartan
Sickle cell disease	Paracetamol Ibuprofen Paracetamol Morphine	Dexamethasone Hydroxyurea Folic acid Penicillin V	Erythromycin Proguanil Mefloquine
Diabetes Mellitus	Metformin Glimepiride Gliclazide Insulin	Sodium-glucose cotransporter-2 (SGLT2) inhibitors Bexaglifloxin Canagliflozin Dapagliflozin Empagliflozin ertugliflozin	Dipeptidyl Peptidase IV (DPP IV) Inhibitors sitagliptin, saxagliptin, linagliptin alogliptin
Asthma	Beclomethasone Budesonide Salbutamol Ipratropium bromide	Budesonide + Formoterol Salbutamol + Beclomethasone (inhalation/aerosol)	Salbutamol + Ipratropium (nebulizer solution) Montelukast

COPD	Salbutamol Ipratropium	Formoterol Salmeterol	Tiotropium
Bipolar (Mania)	Quetiapine Olanzapine Risperidone	Carbamazepine Sodium Valproate	Zuclopenthixol acuphase Chlorpromazine Zuclopenthixol decanoate Fluphenazine decanoate
Depres-sion	Amitriptyline	Citalopram Escitalopram Fluoxetine Fluvoxamine Sertraline	Duloxetine Venlaxafine Desvenlafaxine Levomilnacipran Mirtazapine Bupropion
Psychosis	Zuclopenthixol acuphase Chlorpromazine Zuclopenthixol decanoate Fluphenazine Decanoate	Olanzapine Risperidone Haloperidol	Benzhexol 5mg OD
Epilepsy	Phenytoin Carbamazepine Phenobarbitone	Sodium Valproate Lamotrigine Ethosuximide Clonazepam	

Annex 2:

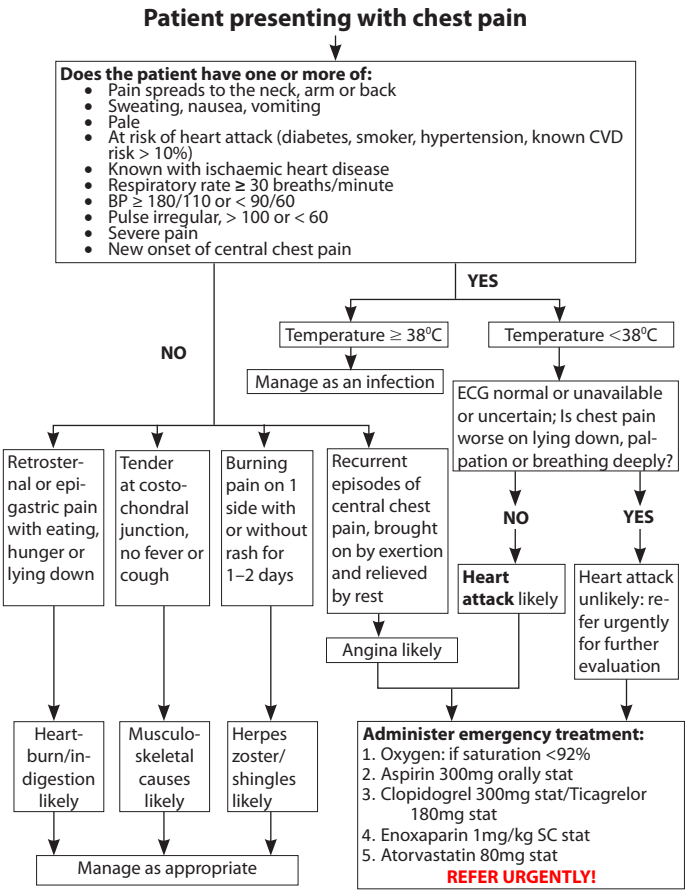
Health education and counselling on tobacco



*** Ideally second follow-up visit is recommended within the same month and every month thereafter for 4 months and evaluation after 1 year. If not feasible, reinforce counseling whenever the patient is seen for blood pressure monitoring.**

Annex 3:

Evaluation of acute chest pain



Annex 6:

Communicating effectively

Communicating effectively with your patient during a consultation need not take much time or specialised skills.
Try to use straightforward language and take into account your patient's culture and belief system.
Integrate these four communication principles into every consultation:

Listen Listening effectively helps to build an open and trusting relationship with the patient.			
DO • give all your attention • recognise non-verbal behaviour • be honest, open and warm • avoid distractions e.g., phones	The patient might feel: • 'I can trust this person' • 'I feel respected and valued' • 'I feel hopeful' • 'I feel heard'	DON'T • talk too much • rush the consultation • give advice • interrupt	The patient might feel: • 'I am not being listened to' • 'I feel disempowered' • 'I am not valued' • 'I cannot trust this person'
Discuss Discussing a problem and its solution can help the overwhelmed patient to develop a manageable plan.			
DO • use open ended questions • offer information • encourage patient to find solutions • respect the patient's right to choose	The patient might feel: • 'I choose what I want to deal with' • 'I can help myself" • 'I feel supported in my choice' • 'I can cope with my problems'	DON'T • force your ideas onto the patient • be a 'fix-it' specialist • let the patient take on too many problems at once	The patient might feel: • 'I am not respected' • 'I am unable to make my own decisions' • 'I am expected to change too fast'
Empathise Empathy is the ability to imagine and share the patient's situation and feelings.			
DO • listen for, and identify his/her feelings e.g.,'you sound very upset' • allow the patient to express emotion • be supportive	The patient might feel: • 'I can get through this' • 'I can deal with my situation' • 'My health worker understands me' • 'I feel supported'	DON'T • judge, criticise or blame the patient • disagree or argue • be uncomfortable with high levels of emotions and burden of the problems	The patient might feel: • 'I am being judged' • 'I am too much to deal with' • 'I can't cope' • 'My health worker is unfeeling'
Summarise Summarising what has been discussed helps to check the patient's understanding and to agree on a plan for a solution.			
DO • get the patient to summarise • agree on a plan • offer to write a list of his/her options • offer a follow-up appointment	The patient might feel: • 'I can make changes in my life' • 'I have something to work on' • 'I feel supported' • 'I can come back when I need to'	DON'T • direct the decisions • be abrupt • force a decision	The patient might feel: • 'My health worker disapproves of my decisions' • 'I feel resentful' • 'I feel misunderstood'

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