Ethiopian National Guideline on Major NCDs 2016

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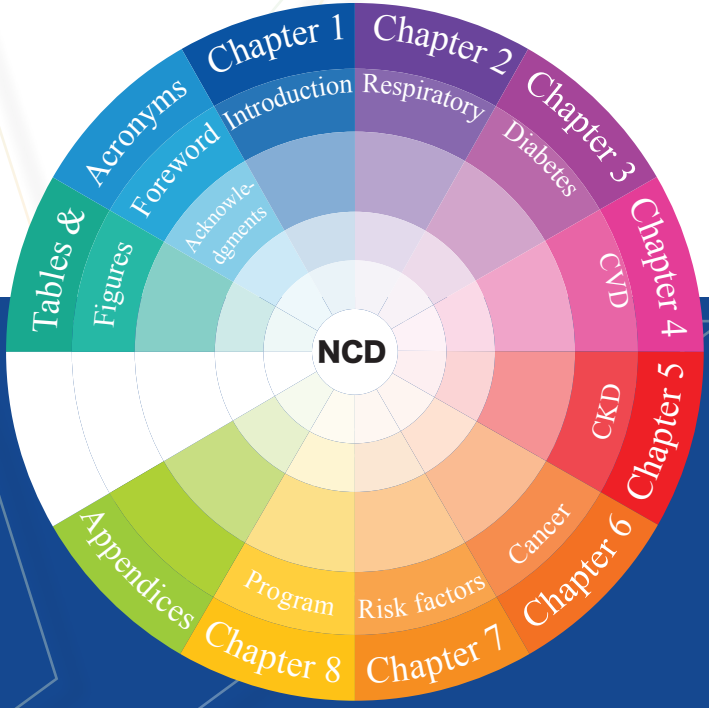
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

MINISTRY OF HEALTH

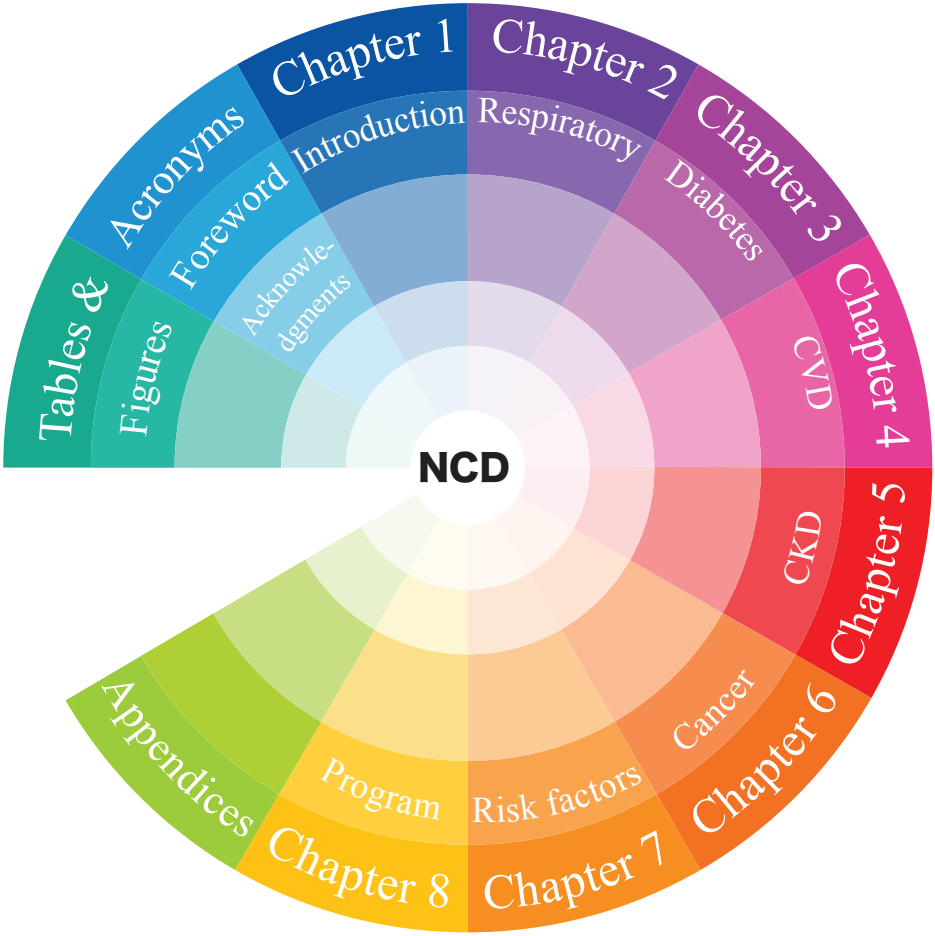
Guidelines on Clinical and Programmatic Management of Major Non Communicable Diseases



Addis Ababa

2016

Guidelines on Clinical and Programmatic Management of Major Non Communicable Diseases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ACRONYMS

ACE	Angiotensin converting enzyme inhibitors
ACQ	Asthma Control Questionnaire
ACR	Urine Albumin to creatine ratio
ACS	Acute Coronary Syndrome
ACT	Asthma Control Test
AFS	Alcohol fetal syndrome
ARBs	Angiotensin receptor blockers
ARF	Acute Rheumatic Fever
ASCVD	Atherosclerotic cardiovascular disease
AUD	Alcohol use disorders
AUDIT	Alcohol Use Disorders Identification Test
BMI	Body mass index
CAD	Coronary Artery Disease
CBO	Community-based organization
CCB	Calcium channel blocker
CBT	Cognitive behavioral therapy
CCB	Calcium channel blocker
CHD	*Coronary heart disease*
CKD	Chronic Kidney Disease
COPD	Chronic Obstructive Pulmonary Disease
CRD	Chronic Respiratory Diseases
CSO	Civil Society Organization
CeVD	*Cerebrovascular disease*
CVD	Cardio-vascular Diseases
DKA	Diabetic Ketoacidosis
DM	Diabetes Mellitus
EDHS	Ethiopian Demographic Health Survey
EPHI	Ethiopian Public Health Institute
ESRD	End stage renal disease
FBO	Faith-based organization
FCTC	framework convention on tobacco control
FEV	Forced Expiratory Volume

FPG	Fasting plasma glucose
FTND	Fagerstrom Test for Nicotine Dependence
FTND	Fagerstrom Test for Nicotine Dependence
GBD	Global Burden of Disease
GDM	Gestational Diabetes Mellitus
GFR	Glomerular filtration rate
GINA	Global Initiative for Asthma
HDL	High Density Lipo-proteins
HED	Heavy episodic drinking
HEW	Health Extension Workers
HHS	Hyperglycaemic Hyperosmolar State
HMIS	Health Management information system
HPV	Human Papilloma Virus
HW	Health Worker
ICS	Inhaled corticosteroids
ICU	Intensive Care Unit
IDF	International Diabetes Federation
IFG	Impaired Fasting Glucose
IGT	Impaired glucose tolerance
LABA	long-acting beta-agonists
LAMA	long-acting muscarinic antagonist
LDL	Low density lipo-protein
MDI	metered-dose inhaler
MET	Metabolic Equivalent of Task
MI	Myocardial Infarction
MNT	Medical Nutrition Therapy
NCD	Non-Communicable Diseases
NIAAA's	National Institute on Alcohol Abuse and Alcoholism
NRT	nicotine replacement therapy
OCS	Oral corticosteroids
OGTT	Oral Glucose Tolerance Test
PEF	Peak Expiratory Flow
PVD	Peripheral vascular disease
RHB	Regional Health Bureau
RHD	Rheumatic Heart Disease

SSA	Sub-Saharan Africa
SBGM	Self-blood glucose monitoring
SBIRT	Screening, Brief Intervention, and Referral to Treatment
TGL	Triglyceride level
WHO	World Health Organization
WoHOs	Woreda Health Office
WHR	Waist-to-hip ratio
ZHDs	Zonal Health Departments

Foreword

The national comprehensive guidelines for prevention, screening, diagnosis, treatment and care for non-communicable diseases (NCDs) is one among many of the efforts to lead to the implementation of interventions to reduce the increasing burden of non-communicable diseases (NCDs) in Ethiopia. The national NCDs framework was developed in 2010 for selected NCDs: diabetes, cardiovascular diseases, respiratory diseases, chronic kidney diseases and cancer, prioritized on the basis of the WHO 2011 and global morbidity report (Abegunde D. O, The Lancet 2007).Following this, the national plan of action for NCDs prevention and control was drafted in late 2013.

These guidelines may be considered a quasi-derived one because only general questions (indicated in the introduction section) are addressed. In preparing these guiding principles, a range of global guidelines have already been developed on major NCDs, and the available information on development and implementation of high-quality clinical practice guidelines have been reviewed and adapted. It is by and large an adaptation of international and regional clinical practice recommendations into a quick 'desktop' or 'pocket guide'. This style places emphasis on advising health workers on what and how to do rather than simply recommend pearls of practice.

This guidance is expected to facilitate prevention, screening, diagnosis, treatment and care at the primary care levels but also clearly indicate situations whereby referral is required to the secondary and tertiary levels of care. It is also expected to be useful to policymakers and health managers at all levels to plan on human resource needs and on overall program management for NCD. For the latter, the guidelines would focus on 'what to do' or 'how to do it', which would have to be described in a more descriptive program implementation guidelines which can only come out of pilot projects and best practices arising from them.. The document, however, would provide a concise statement of what is feasible and desirable in NCD prevention and control that will be useful to managers. It would also

be of interest to academic institutions, medical students, and generally, to multi-disciplinary health professionals who need to get acquainted with National NCD prevention and control efforts. It is with great preference that I urge all stakeholders to use this first edition as a reference and guiding document on the clinical and programmatic management of NCDs in Ethiopia.

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Chapter 1: Introduction and Background

Introduction

Non-communicable diseases are chronic conditions that do not result from an acute infectious process but infectious diseases can be a contributing cause. NCDs cause death, dysfunction, or impairment in the quality of life and usually develop over relatively long period at first without causing symptoms but after the diseases manifestations develop, there may be a period of protracted impaired health. These guidelines deal with selected NCDs which have been responsible for the lion's share of global burden of disease as well as share common risk factors which can be tackled in unison. Though, the hitherto –held beliefs and practices to prevent and control NCDs tilts to tertiary centres and specialists, the goal of widest possible access to services can't be achieved without the contribution of primary care facilities. Similarly high quality cannot be achieved without the link with secondary and tertiary centres.

These guidelines deal in a comprehensive manner with all realms of NCDs interventions such as prevention, treatment and care. The major target audience comprise nurses, health officers and physicians in general practice (MD) working at the primary care level, especially health centres and primary hospitals. The guidelines outline what these cadres can do at the primary level and how the secondary and tertiary levels may be utilized appropriately through referral and linkages. The guidelines are hence informative of what can be done at the primary healthcare level. The last chapter of the guidelines may particularly be useful to policymakers and health managers to be able to determine the basic inputs and outputs for NCD prevention and control at various levels.

Effective approaches to reduce the burden of non-communicable diseases (NCD) include a mixture of population-wide and individual interventions. Such cost-ef-

fective interventions consist of methods for early detection of NCDs and their diagnoses using inexpensive technologies, non-pharmacological and pharmacological approaches for modification of NCD risk factors and affordable medications for prevention and treatment of heart attacks and strokes, diabetes, cancer and asthma.

These low technology interventions, if effectively delivered, can reap future savings in terms of reduced medical costs, improved quality of life and productivity. People with and at risk of NCDs require long-term care that is proactive, patient centered, community-based and sustainable. Such care can be delivered equitably only through health systems based on primary healthcare (PHC).

Why do we need these guidelines?

- These guidelines will support implementation of very cost-effective interventions through an integrated approach.
- Implementation of these guidelines is a key component of priority area 3 of the National Strategic Action Plan for the Prevention and Control of NCDs. These guidelines will enable early detection and management of cardiovascular diseases, diabetes, chronic respiratory diseases and cancer to prevent life threatening complications (e.g. heart attacks, stroke, kidney failure, amputations and blindness).
- Effective implementation of these guidelines, combined with other very cost-effective population-wide interventions, will help our country to attain the global voluntary targets related to the reduction of premature mortality and prevention of heart attacks and strokes.

Background

Non-communicable diseases are the leading causes of death globally, killing more people each year than all other causes combined. Contrary to a widely held opinion, available data demonstrate that nearly 85% of deaths due to non-communicable diseases occur in low- and middle-income countries. Of the 56 million deaths that occurred globally in 2012, 38 million (68%) were due to non-communicable diseases, comprising mainly cardiovascular diseases, cancers, diabetes and chronic lung diseases. The combined burden of these diseases is rising fastest among lower-income countries, populations and communities.

WHO predicted deaths from NCDs will increase globally by 17% over the next ten years where the greatest increase will be in the African region (by 27% or 28 million deaths from NCDs). In Africa, projections indicated death from NCDs to exceed all combined communicable, maternal, perinatal, and nutritional diseases as the most common causes of death by 2030 (1). This implies that NCDs represent a leading threat to health, economies and overall human development in the African region.

The World Health Organization estimate in 2014 showed that in Ethiopia 30% of deaths was due to non-communicable diseases in 2012; in which case cardiovascular diseases accounted for 9%, Cancer 6%, Chronic Obstructive Pulmonary Diseases 3% and Diabetes Mellitus 1%. In addition, other varied NCDs contributed for 11% and injuries for additional 9% of death nationally; whereas, communicable, maternal, perinatal and nutritional conditions combined accounted for 60% of the deaths in the same year. However, small-scale localized studies suggested a much higher level of death from NCDs in Ethiopia than the above estimate. For example in Addis Ababa a verbal autopsy showed 51% of deaths were due to NCDs. Moreover, disproportionate age specific death rates have been also noticed in the country where there is a significant rise in deaths from NCDs between the ages of 44 – 74 years.

Subsequently, this resultant double burden of non-communicable diseases with higher prevalence of pre-existing communicable, maternal, perinatal and nutri

tional conditions constrains the already meager health resources and hinders economic development in Ethiopia.

WHO global disease burden recognizes tobacco, alcohol consumption, obesity, hyperlipidemia, hypertension and hyperglycemia as most important shared risk factors to the four NCDs cited as major global burdens: cardiovascular diseases, diabetes, chronic respiratory diseases and cancer. Tobacco use has been cited and remains the number one preventable cause of death globally. Tobacco kills nearly 6 million people each year and results in the economic loss of hundreds of billions of dollars globally. An additional 600,000 people are estimated to die from the effects of secondhand smoking, and 80% of deaths related to tobacco occurred in low- and middle-income countries.

Evidence around tobacco smoking and other modes of use of tobacco are meager in Ethiopia. The only nationally representative evidence on tobacco use was generated by the Ethiopian Demographic and Health Survey (EDHS, 2005 and 2011). The EDHS 2011 revealed about seven percent of men aged 15-49 use tobacco products of some kind. The same study revealed that prevalence of smoking in Ethiopia among men in the 15-49 age group is 6.1%; while, 2% of men consumed other forms of tobacco. Few women disclosed that they had used tobacco. The study also revealed that males smoked more cigarettes compared to females; as age increases the likelihood of smoking rises; less educated people tend to smoke more. Smoking was found to be highly prevalent among urban dwellers; while, non-smoking tobacco use is more prevalent among rural communities. Of those who smoked the percentage of people who smoked 1-2 cigarettes within 24 hours preceding the survey were 12.8% and 31.2%, 18.1% and 26.5% smoked 3-5, 6-9 and 10+ cigarettes respectively.

Nearly 2.8 million people die each year globally because of being overweight or obese. A STEPS survey in Addis showed a prevalence of 30% for overweight or obese whereas the prevalence of obesity was 2% and 11% for males and females respectively. A summary statistics of EDHS from 2000 – 2011 indicated an overall increment of being overweight/obese among non-pregnant women in Addis Aba

ba over the eleven-year period, from 16.1% in 2000 to 20.6% in 2011, while in the Jimma 'STEP' survey central obesity was 33% and obesity 2.6%.

Approximately 3.3 million deaths (5.9% of all global deaths) that occur each year are due to alcohol consumption. This is greater than, for example, the proportion of deaths from HIV/AIDS (2.8%), violence (0.9%) or tuberculosis (1.7%). In ad-

dition, 5.1% of the global burden of disease and injury is attributable to alcohol, as measured in disability adjusted life years (DALYs). Despite lack of standardized national data, it is reported that consumption of both traditional and industrially produced alcohols in Ethiopia are widely prevalent. Among adults aged 15 – 49, 45% of women and 53% of men, reported drinking alcohol at some point in their lives. A study comprising 241 students randomly selected from two government schools and one private secondary school in Addis Ababa and 187 students from a government secondary school in Butajira found that the percentages of ever using alcohol were 17.9%, 57.8% and 18.2% in the urban governmental high schools, private high school and Butajira rural governmental high school, respectively. Separate studies conducted among students in another school-based study in Harar reported 22.2% history of ever drinking alcohol while 10.4% reported they had drunk alcohol within the last 30 days prior to the study. The prevalence of alcohol consumption in Jimma survey was 7.3%.

Raised total cholesterol is a major cause of disease burden in both the developed and developing world. Raised cholesterol is estimated to cause 18% of the global cerebro-vascular disease and 56% of global ischemic heart disease. A 10% reduction in serum cholesterol in men aged 40 can result in a 50% reduction in heart disease within 5 years, while an average of 20% reduction in heart disease occurs within 5 years in men aged 70 years. Prevalence of high cholesterol level was found to be 0.7% in the Jimma survey.

High blood pressure is the most commonly identified risk factor for CVD among adults globally and forms the basis for the CVD epidemic in sub-Saharan Africa (SSA). Hypertension is consistently and independently associated with the risk of morbidity and mortality from CVD. Globally, sub-optimal blood pressure was estimated to account for 62% of cerebrovascular disease and 49% of ischemic heart disease. Recent studies have described a growing prevalence of hypertension and other CVD in SSA, where they have long been considered rare.

Though there is no comprehensive nationally representative survey in Ethiopia, different studies have shown that raised blood pressure was found to be the most common CVD risk factor in both rural and urban areas. Fikru et.al showed prevalence rate of 31% in urban Addis Ababa and prevalence of 10% in Rural ButajiraAraya et.al also showed a prevalence of 10.1% in South Ethiopia and interestingly there was no difference in prevalence between urban and rural residents. In

a study in Butajra and Addis the prevalence of raised blood pressure was 9.9% in men and 5% in women among the rural community compared with 15% in men and 7% in women of the urban community in Butajira. In Addis Ababa, this went up to as high as 30 % in men and women. Prevalence of raised blood pressure in the Jimma STEPS was 9.3%.

Chapter 2: Chronic Respiratory Diseases

2.1 Bronchial Asthma

2.1.1 Asthma Definition

Asthma is defined as a chronic disorder of the airways that is characterized by variable and recurring symptoms, airflow obstruction, bronchial hyper responsiveness, and an underlying inflammation. Allergic sensitization is important risk factor for asthma. Asthma is often associated with rhinitis, an inflammation of nasal mucosa.

2.1.2. Clinical Features

- Cough
- Wheezing—high-pitched whistling sounds during expiration. Wheezes are usually recurrent. Lack of wheezes does not exclude asthma

2.1.3 Diagnosis

The diagnosis of asthma at primary healthcare level is made by following these steps:

Step 1: Suspect asthma on basis of symptoms and signs suggestive of variable airflow limitation.

The history is extremely important as asthma symptoms vary in severity and may be intermittent, and thus investigations during times of minimal or no symptoms may be completely normal.

The classical symptoms are:

- *Recurrent episodes of wheezing and breathlessness*
- *Troublesome cough usually at night*
- *Cough or wheeze during or after exercise*
- *Cough, wheeze or chest tightness after exposure to airborne allergens or pollutants*
- *Colds "go to the chest" or take more than 10 days to clear.*

Step 2: Search for patterns and associated factors in the history of the patients.

Patterns that suggest asthma are:

- *Day and night, day to day and seasonal variability of symptoms*
- *Precipitation by a range of factors including environmental allergens, irritants, cold weather ,exercise, and respiratory tract infection*
- *response to bronchodilators and corticosteroids;*
- *childhood or early adult history family history of asthma or other atopic disease (allergic rhinitis or eczema)*

Children aged 5 years and less that are suspected of having asthma should be referred to a Pediatrician because of difficulty of making a diagnosis.

2.1.4. Differentiating Asthma from COPD

Table 2.1: Differentiating asthma and COPD

Asthma	COPD
Young age of onset	Long history of smoking
Presence of atopy and /or allergic rhinitis	Usually non-atopic
Diurnal and /or day to day seasonal variation in symptoms and lung function	Insidious onset of symptoms and persistent dyspnoea and slow progression of symptoms
Often normal examination and normal/near normal spirometry while in stable state	Hyperinflation and abnormal spirometry while in a stable state
Marked improvement after bronchodilator and/or 2 weeks trial of systemic corticosteroid*	Poor response to bronchodilators or 2 weeks trial of systemic corticosteroid

*>12% and 200ml improvement in FEV1 or 20% in PEF

Staging Asthma through Assessment of Severity

When asthma is first diagnosed, classification of disease severity as intermittent or mild, moderate or severe chronic persistent asthma may assist with decisions regarding treatment. However, severity of disease may vary across different environments and over time, severity classification does not predict response, and thus classification is of little value in patients already on treatment. Periodic assessment of asthma control and review of management are more relevant during patient follow-up.

Table2.2: Assessment of asthma severity using symptoms and PEF in patients presenting for the first time on no treatment

Intermittent Asthma	Chronic persistent Asthma		
	Mild	Moderate	Severe
I	II	III	IV
Day time symptoms* ≤2/week	Day time symptoms 3-4/week*	Day time symptoms ≥4/week*	Day time symptoms continuous*
Night symptoms≤ 1/ month**	Night symptoms≤ 2-4/ month**	Night symptoms≤ ≥4/ month**	Night symptoms frequent**
PER≥80%	PER≥80	PER 60-80%	PER<60
Exacerbations <1 per year #	Exacerbations > 1 per year#	Exacerbations > 1per year #	Exacerbations > 1 per year#

*any cough, tight chest and wheezing

**any cough, tight chest, wheezing and night wakening

Exacerbation defined as need for treatment with oral corticosteroids; patient with more than one exacerbation per year should be treated as persistent asthma regardless of severity of symptoms between episodes.

2.1.5. Asthma Management

Asthma can be effectively controlled in most patients by intervening to suppress and reverse inflammation as well as treating broncho-constriction and related symptoms.

Set goals of asthma treatment to achieve control

The Global Initiative for Asthma (GINA) has the following goals for asthma treatment:

- *Achieve and maintain control of symptoms;*
- *Maintain normal activity levels, including exercise;*

- *Maintain pulmonary function as close to normal as possible;*
- *Prevent asthma exacerbations;*
- *Avoid adverse effects from asthma medications;*
- *Prevent asthma mortality.*

A) Preventive/Avoidance Measures

Avoidance of triggers wherever possible helps to minimize asthma severity and reduces asthma exacerbations. Practical measures include:

- *Avoid active or passive smoking*
- *Avoid contact with furry animals(e.g. ,cats ,dogs)*
- *Reduce pollen exposure*
- *Reduce exposure to house dust mite*
- *Avoid sensitizers and irritants (dust and fumes) which aggravate or cause asthma especially in the workplace*
- *Avoid food and beverages containing preservatives*
- *Avoid drugs that aggravate asthma such as beta-blockers (including in eye drops), and aspirin and non-steroidal anti-inflammatory drugs.*

B) Pharmacotherapy

Maintenance treatment of asthma is determined by severity on presentation, current asthma medication, patient profile and level of control. There are two groups of asthma medication which include:

- *Relievers-short-acting bronchodilators with rapid onset of action that provide acute relief of symptoms;*
- *Controllers- drugs with anti-inflammatory and/or a sustained bronchodilator action.*

The inhaled route is recommended as drugs are delivered directly into the airways with higher lung concentrations and less systemic side effects. (See appendix 1 for types of asthma drugs.)

Treatment should be increased or decreased according to how well it is controlled and by using the stepwise approach described below.

It is useful to start initially with a high step to achieve control and to show the patient that treatment can help, and then reduce the dose to the lowest dose to maintain control. (See appendix 1 on classification of drugs used in the maintenance of treatment of asthma)

Stepwise approach in the management of asthma

Step 1.Mild Intermittent

- Inhaled salbutamol PRN inhaler 200 microgram/puff, 2 puffs to be taken as needed but not more than 3-4 times a day, or tablet, 2-4mg 3-4 times a day.

Step 2.Mild persistent Asthma

- Inhaled salbutamol PRN inhaler, 200 micro gram/puff 1-2 puffs to be taken, as needed but not more than 3-4 times/day, or tablet, 2-4mg 3-4 times a day)

Plus

- low-dose inhaled Beclomethosone, starting with 200μg BID for adults and 100μg once or twice daily for children

  OR

- low-dose inhaled Budesonide 160μg BID

Option in children

Inhaled salbutamol PRN Motelukast 5 mg po daily

Step 3.Moderate Persistent

- Inhaled salbutamol PRN: inhalation 200/puff 1-2 µg/puffs as needed PRN not more than 3-4 times a day

Plus

- low-dose inhaled Budesonide 160μgBID Plus Formoterol 4.5μg BID

OR (Preferred if symptoms are more severe or if response is not optimal to Beclomethasone)

- Inhaled salbutamol PRN plus low-dose inhaled Fluticasone 250μg-BID Plus Salmeterol 50μg BID

Step 4.Severe Persistent

- Inhaled salbutamol PRN plus medium to high dose Budesonide 320μg BID & Formoterol 4.5μg BID /Fluticasone 500μg BID & Salmetetrol 50μg

OR

Inhaled salbutamol PRN plus medium to high dose Beclomethosone 800μg BID/Budesonide 320μg BID/Fluticasone 500μg BID Plus Montelukast 10 mg po daily

OR

- Inhaled salbutamol PRN plus medium to high dose Beclomethosone 800μg BID/Budesonide 320μg BID/Fluticasone 500μg BID Plus sustained release theophylline 250 mg TID

Step 5.Very severe asthma

- Inhaled salbutamol PRN plus high dose Beclomethosone 1000μg BID/Budesonide 320μg BID & Formoterol 4.5μgBID /Fluticasone 500μg BID &Salmeterol 50μg BID/ PLUS Prednisolone 10 mg po daily.

NB: 1. Patients with category 4 & 5 should be referred for specialist care.

2. It is not recommended to use long-acting Beta agonist alone in the management of persistent Bronchial asthma.

At each step, check the patient's adherence to treatment and observe their inhaler technique. A spacer normally should be used with pressurized metered dose inhalers μ(pMDIs)since they increase drug deposition and reduce oral candidiasis with inhaled steroids.

Inhaled Beclometasone/Budesonide should be available for all patients with persistent asthma.

2.1.6 Assess Asthma Control

Asthma is considered to be well controlled if the patient has:

- *no more than two occasions a week when asthma symptoms occur and require a beta agonist;*
- *asthma symptoms on no more than two nights a month;*
- *no or minimal limitation of daily activities;*
- *no severe exacerbation (i.e. requiring oral steroids or admission to hospital) within a month;*
- *a PEF, if available, above 80% predicted.*

Validated measures for assessing clinical control of asthma are the Asthma Control Test (ACT), or the Asthma Control Questionnaire (ACQ). These are suitable for self-assessments by patients, and provide a reproducible objective measure that may be charted over time (see appendix 2).

Patients with poor asthma control should be assessed for the following:

- *Reasons for poor adherence and misunderstanding the difference between relievers and controllers;*

- *Poor inhaler techniques;*
- *Exposure to trigger factors at home and work;*
- *Presence of gastro-oesophageal acid reflux disease;*
- *Rhinitis and sinusitis;*
- *Use of medications that may aggravate asthma such as aspirin, non-steroidal anti-inflammatory drugs and ß blockers;*
- *Other medical conditions mimicking asthma symptoms (e.g. cardiac disease).*

Step up treatment when control is not achieved after attention to the above factors. Stepping down treatment is recommended when total control is achieved and maintained for at least 3 months. Within a self-management plan, well-motivated patients could also be advised to vary treatment according to PEF and symptom frequency.

Characteristics	Controlled (All of the following)	Partly controlled (Any measure present in any week)	Uncontrolled
Daytime symptoms	≤2/week	>2/week	3 or more features of partly controlled asthma in any week
Limitation of activities	None	Any	
Nocturnal symptoms/awakening	None	Any	
Need for reliever/ rescue treatment	≤2/week	>2/week	
Lung function (PEF/ FEV1)	Normal	<80% predicted or personal best (if known)	
Exacerbations	None	1 or more year	1 in any week

Table 2.3: Levels of Asthma Control

Indication for short courses of oral prednisolone 30-40mg/day for 5-7 days in Asthma include
○ Symptoms and/or lung function (PEF) progressively deteriorating acutely or over several days and associated with increased use of inhaled rescue medication; ○ Lack of sustained relief from rescue medication; ○ Repeated drops in PEF over 1 or more days to below 60% of previous best value; ○ Frequent night time symptoms; ○ Requirement for emergency treatment.

*Stop Systemic steroid abruptly after course (there is no need to taper therapy if used for the recommended duration).
*Inhaled corticosteroids (ICS) for maintenance treatment should be commenced or continued.
*A step-up in maintenance controller treatment may be indicated.
*Patients requiring oral corticosteroids (OCS) for more than 14 days should be referred to a specialist.

2.1.7 Review Asthma Control

Patients with other than very mild asthma should have regular reviews every three or six months and more frequently when treatment has been changed or asthma is not well controlled. This should always include observation of inhaler techniques. Referral to higher level for specialist advice should, depending on facilities available, be considered:

- *when asthma remains poorly controlled;*
- *when the diagnosis of asthma is uncertain;*
- *when regular oral prednisolone is required to maintain control.*

2.1.8 Asthma Education

Optimal management of a chronic disease like asthma requires the active participation of patients. To achieve this, patients require education about asthma and a detailed written management or action plan. A systematic approach is necessary to ensure that all relevant details are included and education should be staged over several visits. The use of health extension workers and other specially trained healthcare professionals is cost-effective.

Goals of asthma education include:
○ An explanation of the nature of asthma and its inflammatory basis; ○ A description of the different classes of drugs and their purpose in treatment (i.e. as-needed "relievers" and regular "controllers"); ○ Advice on prevention strategies (allergen, irritant, and tobacco smoke avoidance); ○ The correct choice and use of inhalers and the opportunity to practice under supervision; ○ How to recognise worsening asthma and how and when to implement their action plan.

Advice to patients and families

Regarding prevention:

- *avoid cigarette smoke and trigger factors for asthma, if known;*
- *avoid dusty and smoke-filled rooms;*
- *reduce dust as far as possible by using damp cloths to clean furniture, sprinkling the floor with water before sweeping, cleaning blades regularly and minimizing soft toys in the sleeping area;*
- *It may help to eliminate cockroaches from the house (when the patient is away) and shake and expose mattresses, pillows, blankets, etc. to sunlight.*

Regarding treatment, ensure that the patient or parent:

- *knows what to do if asthma deteriorates;*
- *understands the benefit from using inhalers rather than tablets, and why adding a spacer is helpful;*
- *is aware that inhaled steroids take several days or even weeks to be fully effective.*

2.1.9. Management of Exacerbation of Asthma (Acute Severe Asthma)

The basic principles of management of acute attack of Bronchial Asthma are the following:

1. Assess the severity of the attack;
2. Use inhaled short-acting beta agonists(Salbutamol 2-4 puff) every 20 minutes for the first hour;
3. If patient is uncooperative, nebulise with short-acting beta two agonist;
4. Start oral prednisolone 0.5mg/kg if there is no immediate and marked response to the inhaled short-acting beta agonist;
5. Oxygen supplementation for patients with O_2 saturation less than 90% ;
6. If there is no improvement with inhaled Short-acting Bronchodilator, add anticholinergic, if available;
7. Make frequent (every 1-2 hour) objective assessments of the response to therapy until definite, sustained improvement is documented;
8. Use Aminophylline i.v if patient failed to improve with the above management, use as added therapy.

   Dosage for patients not previously receiving xanthine group (Aminophylline, theophydrine): A single intravenous loading dose of 5-7.5mg/

kg, maximum dose 300mg for patients who are not responding to routine measures, should then go into maintained therapy with dose of 0.5 mg/kg/hour in I.V infusion (use 5%D/W or 0.9% saline).

9. Magnesium sulphate 2gm i.v infusion over 20 minutes if there is improvement with the above medication.
10. Antibiotics are not routinely used but may be warranted if patient has signs of acute bacterial infection like fever and purulent sputum.
11. Refer a patient who failed to respond to above treatment.
12. Educate patients about the principles of self-management for early recognition and treatment of a recurrent attack and develop an "asthma action plan" for recurrent symptoms on discharge.

2.1.10. Assess Severity

Assess the severity of asthma by analyzing symptoms (ability to complete sentences), signs (e.g. heart rate) and PEF and oxygen saturation, if equipment is available.

Severity signs & symptoms
❖ If a patient does not show improvement with convention therapy or their condition is deteriorating;
❖ If a patient could not complete a sentence;
❖ Change in mental status;
❖ Desaturation <90%;
❖ Pulse >100/minute;
❖ Respiratory rate >30/minute;
❖ Dyspnoea all the time ;
❖ PEF after salbutamol puff <50% of predicted.

NB: If you find a patient with severity sign(s), start management for severe asthma and refer to specialist care.

When to refer a patient to a specialist

A. Difficulty with diagnosis
    - Patients receiving multiple courses of antibiotics
    - Possibility of COPD
    - Asthma for the first time after the age of 60 years
    - Suspected vocal cord dysfunction

B. Suspected occupational Asthma

C. Management Problems
    - Difficult-to-control asthma
    - Recurrent exacerbations >2/month
    - Recent discharge following admission for severe exacerbation
    - Oral corticosteroid dependence
    - Poor control despite intensive treatment
    - Significant corticosteroid side effects

D. Asthma during Pregnancy

E. Co-existing significant medical illness like thyroid disease, collagen vascular disease, peptic ulcer disease, cardiac failure

F. Frequent school or work absenteeism

G. Consideration for immunosuppressive treatment or desensitization

H. Consideration for disability grant or medical board.

2.1.11. Prevention of Asthma

1) Primary Prevention

- Avoid exposure to environmental tobacco smoke during pregnancy and first year of life.
- Encourage vaginal delivery.
- Advice breast feeding.
- Avoid use of paracetamol and broad spectrum antibiotics during first year of life.

2) Secondary prevention

Goal: Early detection of diseases and prevention of progress

- Expanding the usage of PEF monitors and spirometry
  - Supplying PEF monitors and spirometry to health institutions
  - Education of technicians and health professionals
  - Increasing public awareness on measuring lung function with PEF monitors and spirometry
- Decreasing allergen burden
- Increasing awareness of early detection among public and health professionals
  - Education of public and health professionals
  - Awareness campaigns
- Easy access to healthcare services
  - Providing health security to everyone
  - Presence of equipped health institutions at reachable distance
  - Easy access to medicine and treatment equipment

3) Tertiary prevention

Goal: Effective treatment of diseases and prevention of complication development

- Educating patients and healthcare professionals about appropriate treatment
  - Development and implementation of national guidelines
  - Preparing educational material for patients and physicians
  - Providing continuous medical education for physicians
- Expanding home care services
  - Setting up home care service organization
  - Creating public awareness about home care services
- Expanding pulmonary rehabilitation services
  - Having the content of "pulmonary rehabilitation in treatment of chronic airway diseases" in medicine, pulmonary diseases and physical therapy curriculum.
  - Increasing awareness about the importance of pulmonary rehabilitation in the treatment of chronic airway diseases among patients and physicians.
  - Establishing adequate number of pulmonary rehabilitation units.

2.1.12. Proper Recording and Monitoring

- ❖ Forming an assessment, monitoring and registration unit under the auspices of the Ministry of Health.
- ❖ Forming proper assessment and registration methods.
- ❖ Preparation of annual reports.

Planning and carrying out research for evaluating the effectiveness of epidemiological data and control methods of chronic airway diseases.

2.2 Chronic Obstructive Pulmonary Diseases (COPD)

2.2.1 Definition

COPD is a common preventable and treatable disease characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. Exacerbations and co-morbidities contribute to overall severity in individual patients.

2.2.2 Risk Factors

- Cigarette smoking
- Indoor and outdoor air pollution
- Chronic bronchitis
- Longstanding uncontrolled Asthma/Airway hyper reactivity
- Occupational exposure to organic and inorganic chemicals, fumes, and dust
- Infections (TB, acute childhood respiratory infections, etc.)
- Low birth weight
- Diet and nutrition
- Genetics (Alpha-1 anti-trypsin deficiency)

2.2.3. Clinical Picture

❖ **History**

- Progressive and persistent Dyspnea
- Cough with or without sputum production

- Wheezing
- Progressive and persistent pectoral illnesses
- In advanced cases(fatigability, weight loss in advanced diseases, anorexia, depression ,
- anxiety, swelling of legs)

❖ **Physical examination**

Physical findings are generally present with severe disease.

- low diaphragmatic position;
- Decreased intensity of breath and heart sounds, and prolonged expiratory phase;
- Pursed-lip breathing, use of accessory respiratory muscles, retraction of lower interspaces;
- Signs of complication (peripheral edema, increased JVP, Tricuspid regurgitation murmur).

2.2.4 .Diagnosis

Consider COPD and perform Spirometry if any of these indicators are present

- **In an individual over age 40 years**
- **Suggestive history &Physical examination**
- **History of exposure to risk factors**
- **Family history of COPD**
- **confirmation with spirometry***

*Spirometry diagnosis of COPD is defined as presence of post bronchodilator FEV1/FVC<70%

2.2.5. Assessing Severity

Assess severity by symptoms (i.e. as moderate if breathless with normal activity and as severe if breathless at rest), and by PEF and oxygen saturation, if possible.

Assessment of severity

Severity of CPOD will be assessed based on the following parameters:

a. Severity of symptoms(Dyspnoea is the main symptom)

b. Severity of airway obstruction by spirometry

c. Exacerbation of symptoms

d. Co-morbidity

Methods of assessment using post-bronchodilator lung function test (GOLD Standard)

Airflow limitation in COPD is scored as below.

Table 2.4: Showing severity of airway obstruction

No	Degree of obstruction	Post bronchodilator FEV1 predicted
1	Mild	$FEV_1 \geq 80\%$
2	Moderate	$80\% \geq FEV1 \geq 50\%$
3	Severe	$50\% > FEV1 > 30\%$
4	Very severe	$FEV1 \leq 30\%$

2.2.6 Treatment of Stable COPD

The goals of treatment: to reduce symptoms and risks

Symptom reduction includes the following:

- improve exercise tolerance
- relieve discomfort from disabling dyspnea
- Health status & quality of life
- Risk reduction includes the following:
- Reduce long-term lung function decline(progression)
- Prevent and treat exacerbations
- Reduce hospitalizations(serious morbidity)
- Reduce mortality

Management of COPD consists of the following:

1. Non-Pharmacologic therapy

- Rehabilitation
- Oxygen therapy
- Smoking cessation
- Education about the disease and risk factors
- Nutritional support

2. Pharmacologic therapy

- Beta -2 agonist or anti-cholinergics (Short-acting) is the first choice treatment:

• Short-acting bronchodilators, such as salbutamol metered-dose 200ug inhaler PRN, is used as two puffs as required, up to four times daily. Fermoterol is usually used as 2 puffs every 4-6 hours as needed.

• If symptoms are still persist, consider low-dose oral theophylline; most formulations of slow release theophyllines have a 12 hour to 24 hour duration of action.

• If ipratropium inhalers are available, they can be used instead of,

Or in addition to, salbutamol, but they are more expensive. The dosage is Ipratropium 40 ug MDI TID.

- Long-acting bronchodilators are the second choice treatment and they include long-acting beta-agonists (LABA, e.g. formoterol or salmeterol) or long-acting muscarinic antagonist (LAMA, e.g. tiotropium). Salmeterol and formoterol are LABAs administered twice daily because of their duration of action of greater than 12 hours. Salmeterol has a delayed onset of action and is limited by the ceiling dose of 50 µg BID. Regular dose ipratropium (2 puffs 4 times daily) could be substituted for LAMA.

Commonly used inhaled medications

In the management of COPD, inhaled salbutamol or ipratropium as needed are used as reliever medications in all categories. All patients should be counselled to stop smoking and avoid indoor air pollution. Refer for specialist care for severe or very severe COPD (for example, to consider long-term home oxygen therapy and treatment of right heart failure in very severe disease).

General recommendations for the use of Bronchodilators

- Beta agonists or anticholinergics are recommended as first line agents for treatment of stable COPD;
- Combination therapy with Beta agonists and anticholinergics are recommended if monotherapy fails;
- Long-acting formulations of bronchodilators are preferred over short-acting ones;

- Based on efficacy and side effects inhaled bronchodilators are preferred over oral agents;
- Theophylline are of lower efficacy and greater side effects than other bronchodilators and should be avoided unless cost of treatment is an issue;
- Long-term inhaled Corticosteroids use is recommended for severe airway limitations and frequent exacerbations that are not controlled by first line bronchodialators;
- Long-term systemic corticosteroids are not recommended;
- Long-term inhaled Corticosteroids monotherapy is not recommended but combination with other first line agents can be used ;
- Pneumonia and risk of bone fracture should carefully be monitored in long-term use of inhaled Corticosteroids.

2.2.7. Management of COPD Exacerbation

COPD exacerbation is an acute event characterized by a worsening of the patient's respiratory symptoms that is beyond normal day-to-day variations which leads to a change in medication. The exacerbation of COPD can be precipitated by several factors. Most common causes appear to be respiratory tract infection (Viral & Bacterial).

The Goal of the treatment of COPD exacerbations is to minimize the impact of current exacerbation and prevent the development of subsequent exacerbation.

Management of Exacerbation

- Investigate the patient for the presence of infection and other complications & co-morbidities (CBC, CXR, ECG Sputum examination, OFT, Electrolyte);
- Give high doses of inhaled salbutamol by nebulizer or MDI with spacer;

- Antibiotics should be given for all exacerbations with evidence of infection (Increased Dyspnoea, increased sputum volume, Sputum purulence increase);
- For severe exacerbations, give oral prednisolone 30–40mg for about 10-14 days;
- Oxygen should be given with SaO2 of target 88-92%;
- Close monitoring and early referral if there is improvement or deterioration.

2.2.8. Prevention of COPD

1. Primary prevention

- Smoking cessation-counselling
- Improvements of stoves which can combust fuel completely
- Use of chimneys in kitchen and heating areas
- Use of cleaner fuels like gas and use of electricity
- Embracing alternative forms of energy e.g. solar, wind, nuclear
- Pneumococcal vaccines reduce burden of sequels in children to decrease exacerbation in adults with COPD.
- pertussis and measles vaccination
- Adequate nutrition
- Safer workplace environments by wearing protective equipment e.g. clothing, nose mask,
- Regular surveillance of workers at risk

2. Secondary prevention

- Early diagnosis and treatment
- Smoking cessation
- Vaccination to reduce exacerbation-influenza and pneumococcal vaccine
- Adequate nutrition

3. Tertiary prevention

- Occupational rehabilitation
- Chest physiotherapy
- Smoking cessation
- Gov't intervention, e.g. subsidized oxygen concentrators

2.2.9. Palliative care

1- Symptom control

-Morphine for severe and persistent dyspnea and cough.

-Supplemental Long-Term Oxygen Therapy

- A widespread consensus remains on this point.
- Oxygen used 15 or more hours daily to maintain a Pao2 greater than 60 mm Hg
- (oxygen saturation 88-92%).
- Physiologic indications for the use of long-term oxygen therapy include corpulmonale or polycythemia with Pao2 between 55 and 59 mm Hg.

2- Pulmonary Rehabilitation

- Pulmonary rehabilitation programs provide improvements in respiratory symptoms, quality of life, and the 6-minute walk test, among persons with baseline respiratory symptoms and a mean FEV1 of approximately 50% predicted.
- Pulmonary rehabilitation is designed to help patients cope with breathlessness and feel stronger and fitter at the same time.
- Atypical program includes the following:
    - A physical exercise programme, carefully designed for each individual;
    - Advice on lung health and coping with breathlessness;
    - A friendly, supportive atmosphere.

Pulmonary rehabilitation exercises include:

- Lower-body exercises: leg workouts(simple to more intense stair climbing)
- Upper-body exercises: Arm and chest exercises
- Exercises for breathing muscles: Breathing through a mouthpiece against resistance
- Strength training: like lifting weights
- Education in Pulmonary Rehabilitation for COPD generally focuses on: drug adherence, oxygen treatment
- cessation of smoking and healthy diet
- Psychological Support includes relaxation training and other mood-modifying treatments, such as counselling.

- Pulmonary rehabilitation has the medical benefits of:
    - Improving your quality of life.
    - Helping you function better in your daily life.
    - Increasing your ability to exercise.
    - Decreasing the symptoms of your disease or condition.
    - Helping you manage anxiety and depression.

Proper recording and monitoring

- Forming a monitoring and registration unit under the auspices of the Ministry of Health.
- Forming proper assessment and registration methods.
- Preparation of annual reports.
- Planning and carrying out research for evaluating the effectiveness of programs.

Chapter 3: Diabetes Mellitus

3.1 Definition

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage and dysfunction of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels.

3.2 Classification

The ADA/WHO classification of Diabetes Mellitus includes four clinical classes:

1. Type 1 Diabetes Mellitus - results from β-cell destruction due to immune mediated or idiopathic, causing absolute insulin deficiency.

2. Type 2 Diabetes Mellitus–due to a progressive insulin secretary defect on the background of insulin resistance.

3. Other specific types of Diabetes Mellitus - e.g. Diseases of the exocrine pancreas, and drug-induced diabetes (long-term steroid use) and some endocrine diseases like thyrotoxicosis.

4. Gestational Diabetes Mellitus (GDM) - Hyperglycemia diagnosed during pregnancy in previously non-diabetic women.

3.3 Clinical Features of Diabetes Mellitus

Most Type 1 diabetes mellitus and few type 2 diabetic patients usually present with

- *Polydypsia, polyphagia and Polyuria*
- *Unexplained weight loss and weakness*
- *About half of type 2 diabetes patient remained asymptomatic or might have non -specific symptoms.*
- *More than 50% of type two diabetic patients are undiagnosed. This figure is much higher in low income countries.*
- *Some of type 2 DM could present with chronic complications of diabetes mellitus.*
- *Other features of DM blurred vision, recurrent skin infections, recurrent itching of the vulva, abnormal sensory/ motor neurologic findings on extremities, & foot abnormalities (various deformities, ulcers, and ischemia) could be a presenting signs.*

3.4 Screening for Diabetes

Who should be screened for DM? Screening for diabetes could be done at all heath care levels, when the potential candidates appear with symptoms which are related to diabetes and asymptomatic adult patients with the following risk factors.

Criteria for testing for diabetes in asymptomatic adults

1. Testing should be considered in all adults who are overweight (BMI > 25 kg/m2) and have additional risk factors.
   - *Physical inactivity*
   - *First degree relatives with diabetes*
   - *Women who delivered a baby weighing > 4kg or diagnosed with*

GDM previously

- *Hypertension > 140/90 mm Hg or on therapy for hypertension*
- *HDL cholesterol level (< 35 mg/dl. (0.9 mmol/L) and /or a triglyceride level > 250 mg/dl. (2.82 mmol/L)*
- *Women with polycystic ovary syndrome*
- *HbA1c > 5.7 %, IGT, or IFG on previous testing*
- *Other clinical conditions associated with insulin resistance (e.g. severe obesity)*
- *History of CVD*

2. In the absence of the above criteria, testing for diabetes should begin at the age of 45 years.

3. If results are normal, testing should be repeated at least at 3 year intervals, with consideration of more frequent testing depending on initial results (e.g. those with pre-diabetes should be tested yearly) and risk status.

N. B. Screening for diabetes can be performed using the available tests at the health facility for diagnoses of diabetes mellitus in which FBS can be used.

In the event of doubtful cases and during pregnancy, OGTT can be done.

3.5 Diagnosis of Diabetes Mellitus and Pre-diabetes

Diabetes is diagnosed by laboratory measurement of plasma glucose in a blood sample.

Fasting capillary glucose is likely to be the most feasible measurement in primary healthcare facilities.

All diabetics 40 years and above should have the following measurements: waist circumference, blood pressure, fasting or random plasma glucose, urine protein, urine ketones in newly diagnosed diabetes, plasma cholesterol if the test is available and testing of foot pulses and sensation.

During the first-contact in health services in low-resource setting where laboratory measurement of plasma glucose is not available, patients need to be referred to the next level of care for diagnosis. This is often impractical and costly. The use of point of care apparatus or glucometer that measures blood glucose in a capillary blood sample can overcome this deficiency. These devices are currently widely used for self-monitoring of glycaemia in persons with diagnosed diabetes, but are not routinely used for diagnosing diabetes. (See Appendix 1 on diagnostic tests for diabetes mellitus at different levels of the healthcare delivery system)

A-Diagnostic Criteria for Diabetes Mellitus

1. Fasting plasma glucose (FPG) $\geq$ 126 mg/dL(7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.

   Or

2. Symptoms of uncontrolled hyperglycemia (e.g. polyuria, polydipsia, polyphagia) or hyperglycemic crisis and a random (casual, non-fasting) plasma glucose concentration of 200 mg/dL (11.1 mmol/L) or greater,

   Or

3. Two-hour plasma glucose $\geq$200 mg/ dL (11.1 mmol/L) during an oral glucose tolerance test (OGTT). The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water (and plasma glucose measured at 0, 1, & 2hrs)

B-Diagnostic Criteria for pre- Diabetes

- *FBS- 100-125 mg/dL*
- *During an OGTT - 2 hr Plasma glucose - 140- 199 mg/Dl*

3.6 Glycaemic Control

Lowering plasma glucose towards normal values relieves symptoms of hyperglycaemia and has a beneficial effect in preventing or delaying macrovascular and microvascular complications.

3.6.1 Evaluation of a Diabetic Patient

In the initial evaluation of a diabetic patient the following systematic approach is useful.

- *History taking- including duration of diabetes, treatment history , adherence to treatment, level of exercise, dietary history, follow-up profile, level of glucose control, history of complications of diabetes, etc.*
- *Physical examination - should be done thoroughly as other patients with emphasis to height, weight, BMI, abdominal circumference, blood pressure, skin and foot examination and inspection of insulin injection site.*
- *Investigations-recent laboratory test results mainly on blood sugar, urine analysis, lipid profile, etc.*

3.6.2 Non-pharmacologic Management

The majority of persons with Type 2 diabetes are overweight or obese, which further increases their risk of macrovascular and microvascular complications through worsening of hyperglycaemia, hyperlipidaemia and hypertension.

Diabetes education- is the cornerstone of diabetes management.

The members of the NCD care team help people with diabetes to monitor and

manage their diabetes. The team should also respect professional attitudes and behaviors and avoid conflict of opinions among members of the diabetic care team. Patient education needs to be a life time exercise at all stages of the disease. It includes education about the disease and its complication, their dietary therapy, exercise, medications, etc.

Medical Nutrition Therapy (MNT)

- *The main principles of healthy eating plan for diabetes are:*
  - *To balance energy intake and energy expenditure;*
  - *To provide adequate quality and quantity of micro and macronutrients;*
  - *To provide healthy dietary plan in accordance with culture, belief, religious values and socio-economic status.*
- *In general, it is important to emphasize on a well-balanced diet that should take into account individual patient's peculiarities instead of non-scientific restrictions that would make choices very much limited and compliance difficult.*
- *Make starchy foods the base of all meals and increase the amount of high fiber food items, e.g. vegetables and fruits, cereals and whole grains like wheat, barley, rice and corn*
- *Limit intake of fatty foods (encourage low animal fat) and avoid taking simple sugars.*

Physical Exercise

Advice the diabetic patient to have regular moderate-intensity aerobic physical activity for at least 30 minutes, at least 3 to 5 days a week or at least 150 min/week and encourage resistance training three times per week for type -2 diabetes.

Self-blood glucose monitoring (SBGM)

Depending on the socioeconomic status and availability of glucometer and test strips, diabetic patients should be advised to determine their blood glucose at home.

Control of Hyperglycemia

Glycemic targets with optimal management for non-pregnant adults with diabetes:

- *Fasting plasma glucose (capillary) needs to be 80-130 mg/dl*
- *Postprandial (2 h after the beginning of the meal) plasma glucose< 180 mg/dl*

The above targets should be individualized based on the patient's clinical status (e.g. age, co-morbidities, risk of hypoglycemia, life expectancy and complications).

3.6. 3-Pharmacological Management: Treatment of Type 1 DM

Insulin is the mainstay of therapy for patients with type 1 DM and should be promptly initiated as a lifelong treatment. Insulin initiation should be done by a physician; follow-up and dose titration can be done at a primary healthcare level.

Table 3.1: Insulin initiation and dose increment in Type 1 DM

Indication	Insulin type	Starting dose	Increment	Alternative dosing
Adults T1 DM	intermediate Or long-acting e.g. NPH insulin	0.4-0.5 unit/kg Sc 2/3 am, 1/3 pm (If available, 1/3 of the total dose should be regular (short-acting) insulin, 2/3 of it with the morning & 1/3 with the evening NPH)	2 - 4 units every week	Higher dose may be started in patients with severe hyperglycemia.

N.B. Patients with uncontrolled postprandial hyperglycemia, consider adding 4-5 units of regular insulin twice per day to be given with NPH.

In case of hyperglycemic emergencies like DKA, if diagnosis can be made at least with marked elevation of blood glucose plus ketonuria of +2 or above at the health center level, start intravenous fluids with N/S, give the first dose of 10 units of regular insulin IV and 10 units IM and transfer to primary hospital.

If basic diagnostic tests are not available for DKA but patient has significant hyperglycemia, give the usual NPH or premixed insulin S.C or in case of a new type 1 diabetes diagnosis, initiate NPH insulin S.C at a dose of 0.4 to 0.5 U/KG and transfer to the nearest hospital as soon as possible.

For children with DKA intravenous fluid or ORS should be started with first dose of regular insulin at a dose of 0.5 unit/kg sc and refer to the next care level.

3.6.4-Pharmacological Management: Treatment of Type 2 DM

a) **Oral blood glucose lowering drugs**

– can be initiated at a health center level

- Metformin is the first-line oral anti-diabetic agent in patients with type 2 diabetes who are not controlled by life style management only and who do not have contraindications like renal insufficiency, advanced liver disease, hypoxia or drug intolerance.

    - ✓ Metformin, 500 mg, p.o. daily (after the evening meal) ;
    - ✓ Titrate dose every 4 weeks depending on blood glucose levels or HbA1C to a maximum dose 2000 -2500mg. Split dose to twice per day if the daily dose is greater than 500 to 850 mg per day unless using an extended release formulation where 1000mg can be administered once/day.
    - ✓ Side effects: anorexia, nausea, vomiting, abdominal discomfort and diarrhea;
    - ✓ Contraindicated for CKD (Cr >1.5 for males and Cr >1.4 for females, advanced hepatic disease, heavy alcoholism).

- If blood sugar targets are not achieved, **ADD a Sulfonylurea like:**

  - ✓ **Glibenclamide,** 2.5-5mg, p.o. daily 30 minutes before breakfast.
  - ✓ Titrate dose 2-4 weeks depending on HbA1c and/or fasting blood glucose levels to 10 mg BID or
  - ✓ Split dose to twice per day if it is greater than 5mg per day.

ADRs: hypoglycemia, anorexia, nausea, vomiting, abdominal discomfort and diarrhea;

Sulfonylureas may be used if metformin is contraindicated, not tolerated or optimal glycemic control is not achieved with metformin.

b) Insulin therapy in type 2 diabetes mellitus

Insulin initiation in Type 2 DM should be done by a physician, follow up and dose titration can be done at primary healthcare level.

N.B- If postprandial blood glucose remains high with good fasting blood sugar while patient is on basal insulin regimen, pre- meal short-acting agents can be added.

ADRs: hypoglycemia, lipohypertrophy

C/Is: hypoglycemia

Dosage forms: injection, regular insulin, NPH, Pre-mixed insulin 100 unit /ml in 10 ml vial (1000u/vial).

Indications for insulin therapy in T2 DM:

- *Failure to control blood glucose with oral drugs*
- *Temporary use for major stress, e.g. surgery, medical illness*
- *Advanced kidney or liver failure*
- *Pregnancy*
- *Initial therapy for patients presenting with fasting blood glucose >250 mg/dl , random glucose consistently >300 mg/dl, or ketonuria*
- *In patients in whom it is difficult to distinguish type 1 from type 2 DM*

Table 3.2 Insulin initiation and dose increment in Type 2 DM (by a physician)

Indication for insulin	Insulin type	Starting dose	Increment	Alternative dosing
Add on - to oral agent	NPH	10 units at bed time	2–4 units every week	Higher dose may be started in patients with severe hyperglycemia.

C) Reducing the risk of cardiovascular disease, diabetic nephropathy and blindness

Management of Dyslipidemia in diabetes

- *Statins (3-hydroxymethyl-3-methylglutaryl coenzyme A reductase inhibitors) have been found to reduce CVD risk in persons at high risk.*
- *Give satin to all patients with type 2 diabetes aged ≥ 40 years if resources are available.*
- *Statin choices*

✓ E.g. Simvastatin (20-40mg/d), Atorvastatin(10-20mg/d), Rosuvastatin (5-10mg/d)

✓ Alternatively – Lovastatin (20- 40mg/d) can be used.

Indications

- Overt CVD (higher statin doses than the above may be needed per the specialist's decision)
- >40 years of age and have one or more other CVD risk factors
- Without CVD and <40 years - if LDL cholesterol remains >100 mg/dl or

have multiple CVD risk factors

Antihypertensive Treatment in Diabetes

(Recommendation 7 –JNC 8)

In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB.

- *Blood pressure lowering in diabetic patients reduces the risk of microvascular and macrovascular complications.*
- *The target value for BP is <140/90mmHg.*
- *Low-dose thiazides – type diuretic (12.5-25mg hydrochlorothiazide or equivalent) or a calcium channel blocker (CCB) like Nifedipine, amlodipine are recommended as first-line treatment of hypertension in diabetic patients. Other agents that can be used include ACE inhibitors like enalapril, lisinopril or angiotemsin receptor blockers (ARB's) like losartan, candasartan, valsartan or beta-blockers like atenolol, metoprolol, and propranolol. A combination containing more than one agent may be used.*
- *The choice of antihypertensive medication in primary healthcare is likely to be influenced by local availability and cost. Priority should be given to thiazides and ACE inhibitors.*

Nephropathy

Morbidity and mortality from cardiovascular disease (CVD) are two to five times higher in persons with diabetes compared to people without diabetes, and diabetes entails about two-fold excess risk for a wide range of vascular diseases, independently from other conventional risk factors. Treatment recommendations are based on the level of CVD risk as estimated by the WHO CVD risk-assessment tool. Diabetic nephropathy occurs in about 25% of people with type 2 diabetes, and a substantial proportion progresses to end-stage renal disease. Patients with persistent protienuria or overt renal insufficiency should be referred to an internist or a nephrologist.

Prevention of blindness

Diabetic retinopathy is a major cause of vision loss worldwide. The disease evolves through recognizable stages in its progression to blindness. It is an important public health problem and there are effective and accepted screening tests. Timely laser photocoagulation therapy can prevent progression of vision loss.

Patients with diabetes should be screened for diabetic retinopathy by an ophthalmologist or trained screeners soon after diagnosis for type 2 diabetes and starting 5 years after diagnosis in type 1 diabetes. Screening should be repeated one to two years thereafter, or as recommended by the ophthalmologist/the screener. Therefore, primary healthcare workers should refer diabetic patients with recent deterioration of vision or no retinal exam in 2 years to the next level of care.

3.6.5. Management of Acute Complications of Diabetes Mellitus

Diabetic ketoacidosis (DKA) and hyperosmolar hyperglycaemic stateare life-threatening conditions with somewhat different features that require treatment in hospital by experienced staff. Even there, the case-fatality rate can be quite high. Both conditions are characterized by fluid and electrolyte depletion and hyperglycaemia. In a health center setting, it will usually not be possible to diagnose diabetic ketoacidosis, but it should be suspected in patients with extreme hyperglycaemia. Hyperglycaemia slows gastric emptying; therefore oral rehydration might not be effective, even in patients who are not vomiting.

Hypoglycaemia (low blood glucose) is a frequent complication in diabetic patients receiving medication to lower blood glucose, particularly sulfonylurea and insulin. The brain requires a continuous supply of glucose and this is dependent on arterial plasma glucose concentrations. Severe hypoglycaemia is defined as hypoglycaemia where the patient is unable to self-treat. It can cause loss of consciousness and coma, lead to neuronal death and is potentially life-threatening. The functional brain failure caused by hypoglycaemia is corrected after blood glucose concentration is raised. This can be accomplished by ingestion of carbohydrates, if that is feasible or parenteral glucose if not feasible.

a) Diabetes Ketoacidosis

Diabetic ketoacidosis (DKA) is a condition in which there is a severe deficiency of insulin resulting in very high blood glucose which nonetheless is unavailable to the body tissues as a source of energy. Fat is therefore broken down as an alternative source of energy with ketones/ketoacids as a by-product. This state of severe hyperglycemia and ketone body production results in severe metabolic, fluid and electrolyte abnormalities. It often occurs in type 1 diabetes patients but may also occur in type 2 diabetes.

The most common settings in which DKA occurs include previously undiagnosed and untreated diabetes, omission of anti-diabetic therapy, stress of intercurrent illness (e.g. infection, myocardial infarction, stroke, surgery, complicated pregnancy etc.).

Clinical features:

Clinical features may include excessive urination, excessive thirst and drinking of water, nausea, vomiting, abdominal pain (may mimic acute abdomen) and change in level of consciousness. Symptoms of infection or other underlying condition and signs of dehydration with dry skin, reduced skin turgor or sunken eyes with low blood pressure and fast and weak pulse are also very common. Signs and symptoms of acidosis and ketosis include deep and fast breathing, and 'Fruity' breath (smell of acetone). Altered level of consciousness could be a feature of severe DKA.

Diagnosis of DKA

- *Clinical features*
- *Random blood glucose >250mg/dl and*
- *Glucosuria and ketonuria.*
- *If available, others including serum electrolyte particularly potassium and BUN and creatinine determination are important.*

Additional investigations if it is indicated clinically -

Blood film for malaria parasites and full blood count (raised white cell count may suggest bacterial infection) , blood and urine cultures ,Chest X-ray - for pneumonia or tuberculosis and Electrocardiogram in older patients to exclude acute myocardial infarction etc. as a precipitating factor

(see appendix 1 about diagnostic tests for diabetes).

Management of DKA at Health Center

In case of hyperglycemic emergencies like DKA, if diagnosis can be made at least with marked elevation of blood glucose plus ketonuria of +2 or above at the health center level, start intravenous fluids with N/S, give the first dose of 10 units of regular insulin IV and 10 units IM and transfer to primary hospital. If basic diagnostic tests are not available for DKA but patient has significant hyperglycemia, give the usual NPH or premixed insulin S.C or in case of a new type 1 diabetes diagnosis, initiate NPH insulin S.C at a dose of 0.4 to 0.5 U/KG and transfer to the nearest hospital as soon as possible. If blood glucose ≥18 mmol/l refer to hospital with i.v. drip 0.9% NaCl 1 litre in 2 hours, continue at 1 litre every 4 hours until hospital.

B. Hypoglycemia

- ✓ Hypoglycemia occurs in most patients with type 1 diabetes and type 2 diabetes mellitus.
- ✓ Most common risk factors for hypoglycemia are fasting or missed meals, exercise, insufficient meals, overdose of hypoglycemic agents or insulin, chronic kidney disease, hepatic disease and alcohol consumption.
- ✓ Clinical presentations of hypoglycemia associated with adrenergic manifestations are palpitation, sweating, hunger pain, and weakness. Neuroglucopenic manifestations include headache, drowsiness, lethargy and coma.
- ✓ Diagnosis of hypoglycemia is based on clinical manifestation and/or blood sugar values ≤ 70 mg/dl.

Treatment of Hypoglycemia

Unconscious diabetic patients on hypoglycemic hypoglycemic agents and/or blood glucose 70mg/dl should be given hypertonic glucose intravenously. Food should be provided as soon as the patient can ingest food safely. For unconscious diabetic patients on hypoglycemic agents and/or blood glucose<70mg/dl, administer intravenously 20 to 40 l of 40% or 50% glucose (dextrose) over 1 to 3 minutes. If not available, substitute with any hypertonic glucose solution. Food should be provided as soon as the patient can ingest food safely.

- *Oral treatment with glucose containing food, sweetened soft drinks 100-150 ml , 3-4 candy (candies), 1 tablespoonful of sugar or honey (equivalent to 15 gm-20 gm of glucose)*
- *If no response, try intravenous 40 % or 50% glucose 20 to 40ml iv stat, repeat the same in 15 minutes if there is no response.*
- *If still there is no response, start 10 % glucose solution in D/W at rate of 100 ml /hr.*
- *Emergency management should be followed by carbohydrate containing food, e.g. bread, fruits, Injera , etc. when patient is able to take food PO safely.*

Multidisciplinary Team Approach and the level of activities at each healthcare level

It is essential to organize a multidisciplinary team to deliver the best care for diabetic patients depending on the healthcare system of the center; the diabetic patient is always the center of the team.

I. Management at primary level Healthcare Unit:

Health Post

The team should consist of health extension workers and other support staff to provide:

- ✓ preventive services for diabetes mellitus;
- ✓ diabetic clinical diagnosis;
- ✓ Referral services for the patient to the health center for confirmation of diagnosis and management.

Health center

Health officers and nurses should provide screening, diagnosis, treatment and prevention of DM and its complications. If patients with acute complications like diabetic ketoacidosis, hyperosmolar hyperglycemic state and manifestations of chronic complications like proteinuria, neuropathy, and, cardiovascular symptoms present at the health centers, these cases should be referred to general hospitals.

Primary Hospitals

An organized multidisciplinary team may best deliver care for patients with DM, establish chronic illness clinics in the center, perform screening for diabetes mellitus and acute and chronic complications of diabetes mellitus, register and set follow-up programs for patients. They should be able to manage acute complications of diabetes. They are also responsible to follow-up cases referred back from higher levels. Members of such a team can include a primary care physician, nurse practitioner, registered nurse, certified diabetes educator and mental healthcare professional.

II-Management at Secondary Level Healthcare Units

An organized multidisciplinary team may best deliver care for patients with DM. Members of such a team can include a primary care physician, Internists, nurse practitioner, registered nurse, certified diabetes educator, dietician and mental healthcare professional. Diabetic clinics established in the center register and set follow-up programs for patients. Diabetic patients with evidence of chronic complication can be referred for evaluation at tertiary care level 1-2 times per year or as required. Patients will be referred back to primary healthcare for close follow-up at shorter intervals.

III-Management at Tertiary Level Healthcare Units

Tertiary hospitals should provide sub-specialty care for diabetic patients.

An organized multidisciplinary team may best deliver care for patients with DM. Members of such a team can be drawn from internists, endocrinologists/diabetologists, nursing practitioners, registered nurses, certified diabetes educators, dieticians and mental healthcare professionals, neurologists, nephrologists, cardiologists, obstetricians, paediatricians, orthopaedists and others. Diabetic clinics can

be established in the center to register and set follow-up programs for patients. It is alos important to do screening for acute and chronic complications of diabetes. Referral system for evaluation and management of chronic complications should also be put in place. Patients ought to be referred to secondary level Health-care units for follow-up at shorter intervals. Such team should provide a regular training program for healthcare providers and set management guidelines for each complication of diabetes mellitus.

3.7 Diabetes in Children and Adolescents

Diabetes occurs as a result of either defects in insulin secretion (Type one and common in children), insulin action (T2 DM which is common in adults and obese children) or both which results in acute and chronic complication which contribute to morbidity and mortality. Factors which can affect the blood glucose include: food (carbohydrate) intake increases blood glucose; exercise lowers blood glucose and stress may increase blood glucose. Diabetes in paediatrics generally is chal-lenging to manage at the health centre level due to difficulty of diagnosis in very early childhood and the need for insulin at all times.

3.7.1 Major Types of Diabetes in Children

- Type 1 diabetes- the commonest but Type 2 diabetes may be seen in obese children.

3.7.2 Symptoms and signs of diabetes in children may be subtle:

- Frequent and excessive urination initially at night (bed-wetting)
- Excessive thirst, weight loss and Tiredness/malaise
- Skin infections, oral and vaginal candidiasis
- When they are in DKA-dehydration, kussmaul breathing and confusion and coma.
- In babies and young children, signs and symptoms may be less easily detected.

- Diabetes in children may be misdiagnosed as some other conditions such as pneumonia, gastroenteritis, UTI, malaria and meningitis.

3.7.3 Diagnostic Criteria of Diabetes in Children- same as in adults

3.7.4 Treatment of Diabetes

Life-long insulin dependency with minimum twice daily injections and to the standard multiple insulin injections ,a healthy eating plan and regular physical activity are vital but maintaining this balance may be difficult in children due to their variable growth, activity and eating patterns.

3.7.5 Routine Childhood Care

Once the child is out of DKA follow-up care of childhood diabetes can be given at health center level with proper education of healthcare providers.

Components of Routine Care

1. Insulin Therapy

2. Home blood glucose monitoring

3. Hypoglycemia management, dietary advice and physical activity

4. Diabetic education is very vital

5. Monitoring the growth using growth chart

Table 3.3 target blood glucose control

Age	Pre-meal BG level (mg/dl)	30 days average BG level (mg/dl)	Target HbA1c
<5 years	100-200	180-250	7.5–9.0
5-11 years	80-150	150-200	6.5–8.0
11-15 years	80-130	120-180	6.0–7.5
15-18 years	70-120	100-150	5.5-7

Hypoglycemia managment

- ✓ The aim of diabetes treatment should be to achieve the best possible glycemic control without the occurrence of hypoglycemia.
- ✓ Hypoglycemia can be fatal or result in permanent long-term complication.
- ✓ Hypoglycemia occurs when the blood glucose level is below 70 mg/dl or where there are symptoms of hypoglycemia at a level close to this.

Causes of hypoglycaemia in diabetic children are similar to the causes mentioned for adults in addition to too much restriction of carbohydrates by parents to their diabetic children.

Treatment of Hypoglycemia is also similar to that of adults.

Diabetic Ketoacidosis

Diabetic ketoacidosis occurs when there is profound insulin deficiency. At the health centre level intravenous fluid should be started with first dose of regular insulin at a dose of 0.5 unit/kg sc, followed by referral to the next care level

Chapter 4: Cardiovascular Diseases

4.1 Introduction to Cardiovascular Disorders

Cardiovascular disease (CVD) is a major cause of disability and premature death throughout the world. The major underlying causes include atherosclerosis, rheumatic heart disease, hypertension, diabetes and others which develop over many years. CVDs can present gradually or with sudden events like acute coronary events (heart attacks), hypertensive crisis and cerebro-vascular events (strokes) that often are fatal before medical care can be given. Risk factor modification can reduce clinical events and premature death in people with established cardiovascular disease as well as in those who are at high cardiovascular risk due to one or more risk factors.

These guidelines provide evidence-based guidance on how to reduce the incidence of first and recurrent clinical events due to hypertension, rheumatic heart disease, coronary heart disease (CHD) and cerebro-vascular disease (CeVD) in two categories of people. They are:

1. People with risk factors who have not yet developed clinically manifest cardio vascular disease (primary prevention).

2. People with established cardiovascular disease (coronary heart disease, cerebrovascular disease) (Secondary Prevention)

4.2 Hypertension

4.2.1 Definition:

Hypertension is a state of elevated systemic blood pressure that causes marked increment of cardiovascular risk. It is one of the major but preventable risk factors

of coronary artery disease, hemorrhagic and ischemic stroke, heart failure and chronic kidney disease. In 90-95% of cases, the cause is unknown and it is called essential hypertension. Secondary hypertension refers to hypertension caused by other systemic illnesses as part of their manifestation. The common causes are renal parenchymal disease (e.g. glomerulonephritis, chronic kidney disease of any cause), renovascular disease (renal artery stenosis), endocrine (e.g. Cushing syndrome, primary hyperaldosteronism, Pheochromocytoma), coarctation of the aorta, obstructive sleep apnea and drug-induced (e.g. corticosteroid, oral contraceptive pills).

The risk of cardiovascular and renal disease continuously rises over the entire range of blood pressure based on the level of blood pressure. Hypertension is defined as SBP of 140 mmHg or higher, or DBP of 90mmHg or higher, or both.

4.2.2 Classification of Blood Pressure for Adults:

- *Normal: SBP < 120 mmHg, and DBP < 80 mmHg.*
- *Pre-hypertension: SBP 120-139 mmHg or DBP 80-89 mmHg.*
- *Stage 1 hypertension: SBP 140-159 mmHg, or DBP 90-99 mmHg.*
- *Stage 2 hypertension: SBP ≥160 mmHg, or DBP ≥100 mmHg.*
    - *Severe Hypertension :≥180/110*

4.2.3 Diagnosis and Clinical Assessment

Hypertension is the most commonly encountered CVD risk factor and hence requires attention and patients should be evaluated using history, physical examination and selective testing before embarking on treatment.

History:

- Time of first diagnosis of hypertension
- Past antihypertensive medications use
- Symptoms suggestive of coronary heart disease(See CHD section in this chapter for detail)
- Symptoms of heart failure(see respective section for details)
- Symptoms of previous stroke (see stroke section in this chapter)
- Previous history of transient ischemic attack(see stroke section for TIA)
- Previous history of peripheral artery disease(Claudication: Pain in the legs/calves when walking, relived with rest)
- History of known kidney disease, diabetes, high cholesterol levels,
- Alcohol drinking habits, smoking and khat use
- History of possible pregnancy and history of hypertension in previous pregnancies
- Use of medications like contraceptives, NSAIDs , and herbal medications
- Family history of hypertension, diabetes, stroke or heart attack

Physical Examination

Measurement of BP: Patients should be allowed to sit for 5 minutes before beginning measurement. The cuff should be at heart level. The average of at least two BP measurements, spaced 1-2 minutes apart should be taken. During first visits, BP should be measured in both arms to detect possible differences and the arm with the higher value should be taken as the reference for subsequent measurements. The diagnosis of hypertension should preferably be confirmed at an additional patient visit, usually 1-4 weeks after the first measurement.

❖ **Common errors in BP measurement:**

- *Cuff placed over clothing*
- *Inappropriate cuff size, (The length of the bladder should be 80%, and the width of the bladder should be at least 40 % of the circumference of the upper arm).*
- *Inaccurate sphygmomanometer (e.g. not serviced regularly, not validated correctly)*
- *Arm elevated above heart*
- *Failure to check that both arms give comparable readings*
- *Patient not rested before measurement*
- *Patient talking during measurement*
- *Failure to palpate radial pulse before auscultator measurements*
- *Deflating the cuff too quickly (> 2–3 mmHg/ beat)*
- *Re-inflating the cuff to repeat measurement before it has fully deflated*
- *Rounding off reading by more than 2 mmHg when recording measurement*
- *Taking only a single measurement*

A complete physical examination is important during the first visit. Note the following points:

❖ Measure BP (see BPMD and BP measurement)

❖ Measure weight and height and calculate BMI

- (BMI in kg/m2= Weight in Kg divided by the square of the height expressed in meters)

- Measure waist circumference
- Check for weakness of arm and/or leg on one side of the body

Tests (For primary healthcare)

- Hemoglobin and/or hematocrit
- Fasting plasma glucose
- Urine analysis

After evaluating patients, primary healthcare providers should refer patients to higher levels of care if any of the following are present:

- Blood pressure differences between the two arms in SBP > 20mmHg and / or DBP > 10 mmHg (confirmed by at least two measurements)
- BP > 200/ 120 mmHg
- Patients with known or positive history of coronary heart disease, heart failure, stroke/ TIA, peripheral arterial disease (see above)
- Pregnancy
- Urine positive for protein (on 2 or more occasions), microscopic haematuria or casts
- Positive urine glucose in undiagnosed or uncontrolled diabetic
- BP still > 140 / 90 mmHg despite maximum dose of 3 drugs and optimum lifestyle measures

Examination of patients (For secondary and tertiary level care)

Note the following additional points during physical examination:

- *Signs of heart failure: distended jugular veins, rales on chest examination, gallop rhythm, murmurs, enlarged liver, ascites and peripheral oedema;*

- *Arterial pulses: diminished/ absent peripheral pulses, carotid and renal artery bruit;*
- *Eyes: check optic fundi for hypertensive or diabetic changes and xanthomas around the eyes;*
- *Neurologic examination- may reveal neurologic deficits of previous stroke.*

Tests (For secondary and tertiary level)

At secondary and tertiary care levels the following additional tests should be done:

- *Lipid profile: total cholesterol, high density lipoprotein, low density lipoprotein, triglyceride*
- *Electrolytes: serum potassium;*
- *BUN and creatinine;*
- *ECG.*

4.2.4 Management

✓ Goal of Treatment

To Keep BP below 140/90 and below <150 /90 for elderly (>75years)

I. Non-pharmacologic treatment

❖ *Dietary Changes*

- *Restrict salt (sodium chloride) and reduce salt when cooking, limit processed and fast foods.*
- *Five servings (400-500 grams) of fruits and vegetables per day. One serving is equivalent to one orange or apple or banana or three tablespoons of cooked vegetables.*
- *Limit fatty meat, dairy fat and cooking oil (less than two table-*

spoons per day).

- *Replace palm or coconut oil with soya/corn/safflower oil, if available.*
- *Replacing other meat with chicken (without skin) and fish, if affordable, can be useful.*
- *Also limit intake of free sugars (e.g. sugar sweetened beverages, calorie rich, but nutritionally poor, snacks such as sweets, cakes, and crisps).*
- *Intake of whole grains and pulses should also be encouraged.*

❖ *Exercise*

- *All individuals should be encouraged to take at least 30 minutes of moderate physical activity (e.g. brisk walking, cycling) a day for at least five days a week.*

❖ *Weight loss*

- *All individuals who are overweight or obese should be encouraged to lose weight through a combination of reduced-energy diet (dietary advice) and physical activity.*

❖ *Limited alcohol intake*

- *Women who consume two or more alcoholic beverages per day and men who have three or more drinks per day should be advised to reduce alcohol consumption.*

❖ *Smoking cessation*

- *All nonsmokers should be encouraged not to start smoking and all smokers should be strongly encouraged to quit smoking by a health professional and supported in their efforts to do so. Individuals who use other forms of tobacco have to be advised to stop as well(refer to chapter on prevention and control of NCD risk factors).*

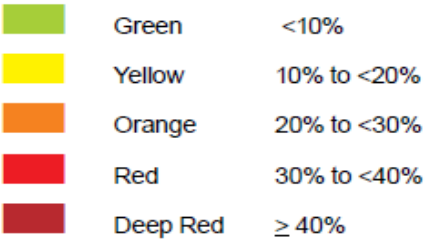
II. Pharmacologic Treatment

- *All individuals with blood pressure at or above 160/100 mmHg should have drug treatment and receive specific lifestyle advice to lower their blood pressure and risk of cardiovascular disease.*
- *Those with lesser degree of raised blood pressure (140-159/90-99) with target organ damage (see below) should undergo drug treatment and be given specific lifestyle advice to lower their blood pressure and risk of cardiovascular disease.*
- *All individuals with blood pressure below 160/100 mmHg, with no target organ damage need to be stratified and managed according to their cardiovascular risk (10 year risk of cardiovascular event) (Refer to the cardiovascular risk assessment chart and guidelines below). Those with 10 year risk of CVD greater than 20% should be initiated with drug treatment.*

Fig 4.1: Modified /Simplified risk assessment chart and guidelines*

Risk Factors	Level of BP Measurement		
	140-159/90-99	160- 179/100-109	> 180/110
No risk factors	Low risk	Medium	High
<2 risk Factors	Medium	High Medium	Very high
>3 risk factors, target organ damage or diabetes	High	High	Very high
Associated clinical conditions	Very high	Very high	Very high

10-year combined myocardial infarction and stroke risk (fatal and non-fatal)



Drug Classes for primary health care

Factors that should be considered before the selection of an antihypertensive agent include the following: cost of the drug class, patient-related factors such as the presence of major risk factors, conditions favoring use of specific drug category(see table 4.1), contraindications(see table 4.2), associated clinical conditions and the presence of target organ damage.

In the absence of compelling indications, the least expensive of the following classes of drugs are preferred as first line agents to control hypertension:

- Thiazide diuretics
- Calcium channel blockers (sustained-release formulations)
- Angiotensin converting enzyme inhibitors

Other classes of drugs are used under specific conditions and are described in table 4.2. For antihypertensive agents and their common side effects see appendix 4.

Table 4.1: Compelling indications for the use of specific antihypertensive drugs

Indication	Antihypertensive drugs
Proteinuric CKD	ACE inhibitor, ARB
Systolic heart failure	ACE inhibitor or ARB, Beta-blocker, diuretic, aldosterone antagonist
Atrial fibrillation/flutter rate control	Beta-blocker, non-dihydropyridine calcium channel blocker
Post-myocardial infarction	ACE inhibitor, beta-blocker, aldosterone antagonist
Angina pectoris	Beta-blocker, calcium channel blocker

Table 4.2 Drugs: dosage and contraindications for use

Class of drug	Drug	Daily dosage	Contraindications
ACE inhibitors	Enalapril	Initial dose 2.5-5 mg BID, increasing to 10-20 mg BID	
	Lisinopril	Initial dose of 5-10 mg daily increasing to 20-40 mg daily	
ARBs (Angiotensin receptor blockers)	Losartan	Initial dose of 50 mg daily, increased to 100 mg daily	Pregnancy Hyperkalemia Bilateral renal artery stenosis
	Valsartan	Initial dose of 80 mg daily , increased to 320 mg daily	
CCBs (calcium channel blockers)	Nifedipine (sustained release formulation)	Initial dose of 30 mg daily (XL nifedipine), increasing to 60-120 mg daily For other preparations starting dose of 10-20 mg BID increased to 20-40 mg BID	Tachyarrhythmias Heart failure
	Amlodipine	Starting at 2.5 mg daily and increasing to 10 mg daily	
Thiazide diuretics	Hydrochlorothiazide	Starting at 12.5 mg increasing to 25 mg once daily	Gout
Beta-blockers	Propranolol	80 mg BID	Asthma COPD AV block (grade 2 or 3)
	Atenolol	50mg -100mg/d	

4.2.5 Follow-up and Clinical Monitoring

Start at low doses and increase dose step by step to maximum tolerated dose in order to achieve target BP control;

If on maximum, or highest tolerated dose of a single agent, and BP is not controlled, combination therapy should be instituted with another drug from the first-line classes; monitor potential side effects and lower dose or change the drug if they occur.

Those in green area of risk chart need assessment every 2-5 years, while yellow area need assessment every year.

Adherence counseling will be an important intervention to enhance quality of care as shown in appendix 4.

4.3 Hypertensive Crisis

Hypertensive Urgency: Hypertensive urgency occurs when blood pressure readings are 180/110 or higher -- but there is no damage to the body's organs.

Blood pressure can be brought down safely by 25 % of elevated level with antihypertensive. The goal of the management is to reduce the blood pressure to ≤160/100 mmHg over several hours to days, not rapidly. This is based on the adverse effects observed with faster correction and/or lower achieved blood pressure.

Treatment of hypertensive urgency:

For previously treated patients - adjust existing medication regimen, or reinstituting their medications (if nonadherent).

For previously untreated patients – start either a low dose of a calcium channel blocker (Nifedipine slow release 30) or ACE inhibitor (captopril or Enalapril) or Beta-blocker.

- Furosemide 20 -40mg (PO or IV) can be added to the above agents.

- If patient is reliable, follow-up can be made every one to two days. If not reliable, admit.

- Avoid rapid drop in blood pressure.

Hypertensive Emergency: Hypertensive emergency means severely raised blood pressure (>200/120) in the presence of end organ damage. Blood pressure must be reduced immediately (within minutes) to prevent progressive organ damage. This is preferably done in an intensive care unit of a hospital.

Organ damage associated with hypertensive emergency may include:

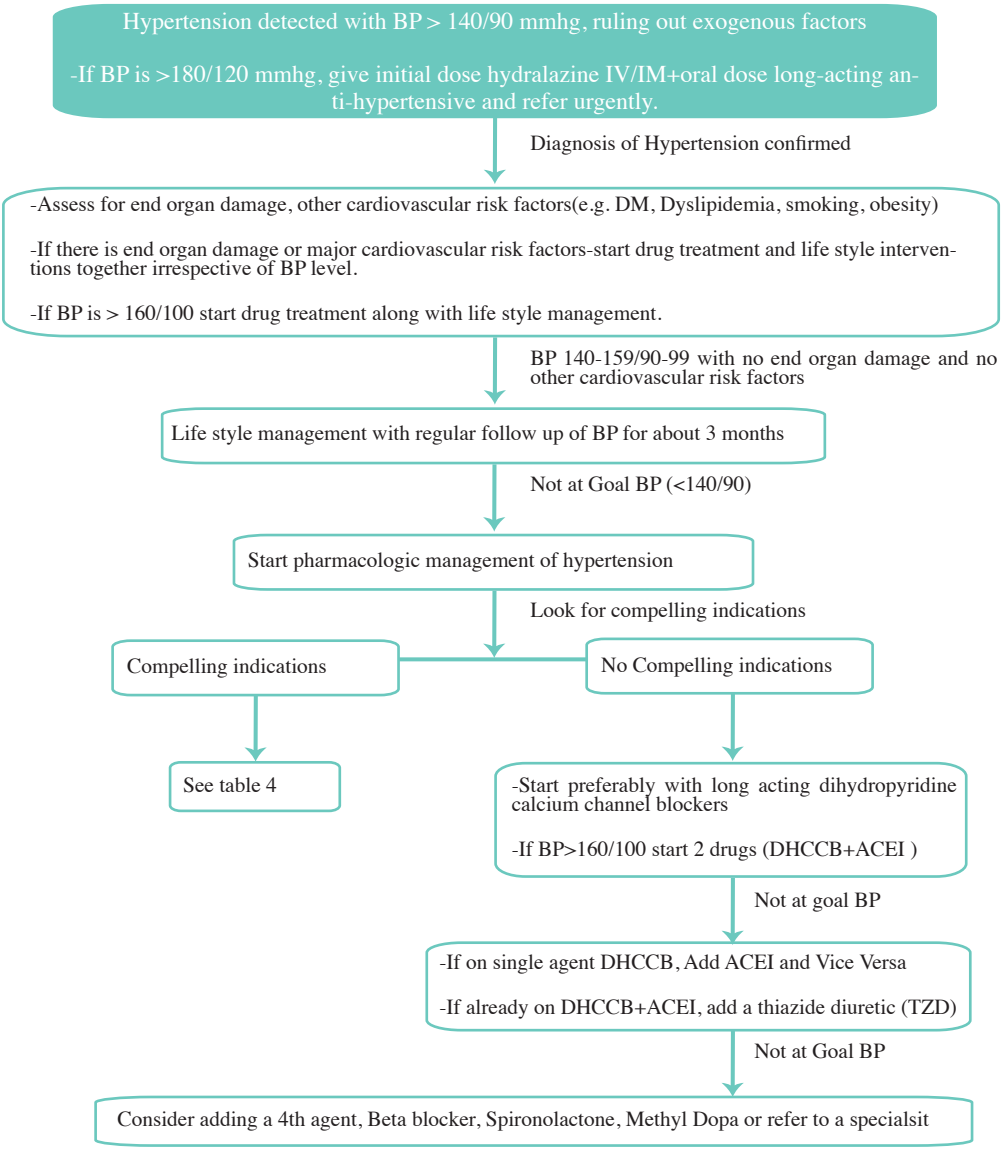
- stroke
- Heart failure
- unstable angina
- pulmonary edema
- Myocardial infarction
- Aneurysm (aortic dissection)
- Eclampsia (occurs during pregnancy).
- Headache or blurred vision

Treatment for Hypertensive Emergency

In a hypertensive emergency, the first goal is to bring down the blood pressure as quickly as possible with intravenous (IV) blood pressure medications to prevent further organ damage.

Hydralazine, 5-10 mg IV/IM initially and refer to higher health facility after giving one oral dose of long-acting antihypertensive like Atenolol (50mg) or metoprolol (50mg) or Propranalol(40mg).

Fig 4. 2: Algorithm for the treatment of Hypertension



4.4 Rheumatic Heart Disease

4.4.1 Definitions:

A. 'Sore throat' (pharyngitis) is a common childhood inflammation of upper respiratory tract pharynx) caused by viral or bacterial infections. The majority of sore throats are short-lived viral infections which can be resolved without complication. Other sore throats are caused by a bacterial infection. The most common cause of bacterial sore throat is group A streptococci (GAS).

B. Acute Rheumatic fever is non-suppurative complications of Group A streptococcal pharyngitis due to delayed immune response affecting joints, central nervous system, skin, and heart.

C. Rheumatic Heart Disease is the only chronic complication of acute Rheumatic fever and affects the valves causing thickening, fibrosis and calcification. These pathologic changes eventually lead to progressive narrowing and failure of elasticity of valve leaflets resulting in stenosis and regurgitation of the valves respectively. Mitral valve is the commonest valve involved followed by aortic valve. The disease runs long asymptomatic period until the hemodynamic impact of the valvular changes leading to congestive heart failure, infective endocarditis and development of arrhythmia resulting in cardiac embolism.

4.4.2 Diagnosis

A. Streptococcal Pharyngitis:

1. Clinical Decision Rules (CDRs): since culture and serologic tests are not available where streptococcal infections are common, clinical decision rules are used to predict the likelihood of streptococcal infections in patients who present with sore throat. Clinical findings which suggest bacterial throat infections include:

- Pharyngeal exudates
- Fever greater than 38oC
- Cervical lymphadenopathy
- Absence of rhinorhea (nasal flow)

2. Serologic tests: ASO and Anti DNASE titer for rapid detection of streptococcal infections. This can be done at primary/ secondary hospitals.

3. Isolation of Streptococcus using culture in symptomatic patients is definitive and used for drug sensitivity test. This can be done at tertiary hospitals.

B. **Acute Rheumatic Fever**: Modified Jones Criteria are currently used to diagnose Acute Rheumatic fever and Rheumatic Recurrence (see the revised Jones criteria below).

Major Criteria

- ***Polyarthritis:*** Migrating arthritis that typically affects the knees, ankles, elbows and wrists. The joints are very painful and symptoms are very responsive to anti-inflammatory medicines.
- ***Carditis:*** Enlargement of the heart on physical examination and/or on Chest X-ray. All layers of cardiac tissue are affected (pericardium, epicardium, myocardium, and endocardium).The patient may have a new or changing murmur, with mitral regurgitation being the most common followed by aortic insufficiency.
- ***Subcutaneous nodules:*** Usually located over bones or tendons, these nodules are painless and firm.
- ***Chorea:*** This is abrupt, purposeless movement which resembles dancing. It may be the only manifestation of ARF and its presence is diagnostic. It may also include emotional disturbances and inappropriate behavior.
- ***Erythema marginatum:*** A non-pruritic rash with redness at the edges that commonly affects the trunk and proximal extremities, but spares the face. The rash typically migrates from central areas to periphery, and has well-defined borders.

Minor Criteria:

- ***Fever***
- ***Arthralgia*** in absence of polyarthritis
- Acute phase reactants: Leukocytosis, elevated erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP)
- Prolonged P-R interval on electrocardiogram (ECG)in absence of carditis

Essential Criterion for Diagnosis

- Evidence of preceding streptococcal infection: Any one of the following is considered adequate evidence of infection:

  - *Increased antistreptolysin O antibodies (ASO titre even at primary hospital level)*
  - *Positive rapid direct Group A streptococcus carbohydrate antigen test (secondary hospital level)*
  - *Positive throat culture for Group A beta-hemolytic streptococci at tertiary level*

Diagnosis of Acute Rheumatic fever is made when **two major or one major plus two minor criteria are met in the presence of evidence of preceding streptococcal infection.**

Exception! Chorea and chronic rheumatic heart disease don't require evidence of preceding streptococcal infection .

Suspected case of acute rheumatic fever has to be referred immediately to general hospital for confirmation of diagnosis.

C. Chronic Rheumatic Heart Disease: This is the most common form which the majority of patients with rheumatic attack are diagnosed with because most come in advanced stage. It is an echocardiographic diagnosis based on specific morphologic changes of the valves.

4.4.3 Management

A. Streptococcal pharyngitis or sore throat:

- ***Treat*** all children suspected of streptococcal pharyngitis based on CDRs or culture proven bacterial pharyngitis with Benzathine Penicillin.

Dose: - For Patients weighing less than 27kg: 600,000IU stat

-For Patients weighing more than 27kg: 1.2 million IU IM stat

- ***Side Effects:*** the most commonly feared side effects of Benzathine Penicillin are Anaphylactic Shock and Neurogenic shock (Vasovagal Reaction). Pain related with injection is a common side effect as well. Recognize and Treat Anaphylactic Shock early: Indicators of Anaphylactic shock are low BP(anything below 90/60 is suspect),Tachycardia, Sweating, Dizziness, Dyspnoea, Syncope, Death, if not treated.

- Recognize and treat neurogenic shock/Vasovagal Reaction: Low BP, Bradycardia, Dizziness and Syncope.

- The setup for injection should have emergency kit to handle these rare side effects.

  - *Emergency Drugs: Adrenaline(in a syringe), Atropine(in a syringe)*

  - *IV fluids ,Oxygen ,suction machine ,ambu bag*

  - *Skin test for patients starting with Benzathine Injection and changing batch number or brand name.*

B. Acute Rheumatic Fever:

❖ Decreasing rheumatic recurrences

  - *RF with no carditis : Benzathine penicillin every 4 weeks for five years or until the person reaches 21 years old*

  - *RF with carditis: Benzathine penicillin for life*

- ❖ High dose anti-inflammatory agent like ASA, with dose of 75-100mg/kg/d divided into 4-6 doses, is highly effective in controlling the acute inflammatory phase of Rheumatic Fever. Predinsolone with dose of 1-2mg/ kg for two weeks and then tapered over 2-4 weeks is indicated if patient develops carditis.

Treatment of acute rheumatic fever should be done at secondary or tertiary level. Follow up after stabilization can be continued at primary care level for monthly administration of benzathine penicillin.

C. Treatment of rheumatic heart disease

Most of the treatment of complications of Rheumatic heart disease should be done at hospital level but subsequent follow-up after stabilization can be continued at the primary care level, particularly refill of medications for CHF and arrhythmia. Those on Anticoagulation are best followed up at the hospital level with the available means of monitoring INR level.

1. Treatment of Heart Failure: (see Heart Failure section)

2. Infective endocarditis (see appendix 5)

3. Atrial Fibrillation and embolic complications

- ❖ **Rate Control:** the goal is to maintain resting heart rate of 70-80 and not greater than 110/min with moderate exercise .Use B-blockers (atenolol, Metoprolol) or calcium channel blockers. If these fail, use digoxin.

Anticoagulation: This can be started only in secondary or tertiary levels where close monitoring of PT and PTT is possible.

4 **Surgical or Percutaneous Interventions**

All patients diagnosed with RHD should have regular referral to a higher center (every six months for severe RHD, every 1-2 years for mild to moderate RHD or at worsening of symptoms) for intervention, if available.

4.4.4 Prevention of RHD

1, Primordial : Policymakers

- Improving living standard
- Improving personal hygiene
- Avoid overcrowding at home and school.

2, primary Prevention: Community , health post, health Center and higher health facilities

- Increasing awareness of the relationship between sore throat and heart disease;
- Increasing access to healthcare;
- Improving knowledge of health professionals in identifying and treating bacterial sore throat;
- Delivery of good quality Benzathine penicillin;
- Treating all children suspected of having bacterial sore throat based on clinical diagnosis.

3. Secondary Prevention: Health center/ district hospitals/general hospitals. This is to prevent the progression of Rheumatic heart disease by decreasing rheumatic fever recurrences with lifelong Benzathine penicillin once RHD has developed.

- Increasing early detection of Rheumatic Fever and RHD;
- Training health professionals in how to increase adherence to penicillin;
- Training health professionals on early detection of RHD clinically or by Echocardiography;
- Setting up School Screening programs.
- Setting up Registry of diagnosed case.

4.5 Coronary Heart Disease

4.5.1 Definition

Coronary artery disease is an atherosclerotic cardiovascular disease with partial or total occlusion of the coronary arteries caused by the inability of atherosclerotic coronary arteries to perfuse the heart. It results from an imbalance between myocardial oxygen supply and demand. It can present as chronic angina pectoris or acute coronary syndrome.

4.5.2 Assessment

A. Ask the patient about:

- Symptoms and signs:
  - *Any pain/pressure/heaviness in their chest, which*
  - *lasts more than 30 minutes, brought on by walking or exercising and goes away after stopping exercise or after resting. This is referred to as angina.*
  - *Pain in the legs when walking that is relieved with rest could be a sign of peripheral vascular disease.*
  - *Difficulty of breathing and/or ankle swelling could be symptomatic of heart failure.*
- Past history: including CVD, hypertension, diabetes, kidney disease, high cholesterol
- Lifestyle risk factors: smoking, and physical activity
- Family history of CVD, hypertension or diabetes in a first degree relative < 50 years old
- Current medications

Management

- If there was any of the above symptoms previously or there is known diagnosis of CVD, refer to a setting with specialist facility (referral hospital?) for initial assessment.

- If there are current clinical features suggestive of the following conditions, refer urgently to a hospital with specialist facility.

    - Acute cardiovascular events:

        1- severe left-sided chest pain or shortness of breath worse on activity may be due to heart attack, angina, heart failure, arrhythmias;

        2- sudden weakness of one side of the body may be due to stroke or a transient ischemic attack;

    - Suspected cardiovascular disease with no initial specialist assessment (a specialist facility).

Once the condition of the above categories of people is assessed at specialized facility and patient is stabilized, they can be followed up in a primary care facility based on the recommendations provided in these guidelines. They will need periodic reassessments in specialty care.

B. Examine the adult patient

Check for signs of severe illness. Refer urgently to hospital if there are any of the following signs:

Do pertinent quick physical examination relevant to the presenting problem and possible causes and provide emergency treatment before referral. If there are no signs of severe illness, perform comprehensive physical examination. For those with normal BP, advise them to have BP measurement once per year. (See section on hypertension)

Check weight and waist circumference. If overweight or waist circumference is > 102cm (men) or > 88cm (women), explain about risks of obesity to the client.

Check blood glucose. (Read chapter on Diabetes Mellitus).

4.5.3 Diagnosis of Coronary Artery Disease

Coronary artery disease mainly presents with chest pain or discomfort, and it has a potentially poor prognosis. This emphasizes the importance of prompt and accurate diagnosis. In this section of the guidelines we will discuss assessment and diagnosis of people with recent onset of chest pain or discomfort of suspected cardiac origin. In deciding whether chest pain may be cardiac, a number of factors need to be taken into account. These include the person's history of chest pain, cardiovascular risk factors, history of ischemic heart disease and any previous treatment, and previous investigations for chest pain.

For pain that is suspected to be cardiac, there are two separate diagnostic pathways presented in this section. The first is for people with intermittent stable chest pain in whom stable angina is suspected, and the second is for people with acute chest pain and a suspected acute coronary syndrome. The guidelines includes how to determine whether myocardial ischemia is the cause of the chest pain and how to manage the chest pain while people are being assessed and investigated.

4.6 Chronic Stable Angina

You can diagnose stable angina based on clinical assessment and / or diagnostic testing. Chronic angina pectoris, by definition, is stable. This means, the severity and/or frequency of chest pain does not increase or occur at rest.

Diagnosis based on clinical assessment:

Perform Appropriate History, Physical Examination, Laboratory Studies and Patient Education.

History

Anginal pain is:

- Constricting discomfort in the front of the chest, or in the neck, shoulders, jaw, or arms;
- Precipitated by physical exertion;
- Relieved by rest or nitroglycerin within about 5 minutes.

- Criteria of diagnosis:
- If three of the features above are present in a patient, it is defined as typical angina.
- If two of the three features above are present, it is defined as atypical angina.
- If one or none of the features above are present, it is defined as non-anginal chest pain.

Other clinical characteristics of angina include the following:

- ❖ Character: usually described more often as a discomfort, pressure, heaviness, or squeezing sensation. Sometimes described as a burning or sharp sensation.
- ❖ Location: sub-sternal area, precordium or epigastrium with radiation to the left arm, jaw or neck, less commonly felt only in radiation area and not in the chest.
- ❖ Precipitation: often provoked by exertion, cold weather, eating, smoking and strong emotions. Relieved by rest, removal of provoking factors, or sublingual nitrates.
- ❖ Duration: few minutes usually, rarely more than 4-5 minutes.

Take the following factors, which make a diagnosis of stable angina more likely, take into account estimating people's likelihood of angina:

- ❖ Increasing age and male gender
- ❖ Cardiovascular risk factors including: smoking, Diabetes, hypertension, dyslipidemia, family history
- ❖ History of established CAD: previous MI, coronary revascularization.

The following are clinical features that make diagnosis of stable angina unlikely:

- ❖ When the chest pain is very brief
- ❖ Aggravated by breathing (Pleura)

- Associated with symptoms such as difficulty of swallowing or tingling(Oesophageal origin)
- Chest tenderness or sharply localized to a point (musculoskeletal pain).

Physical Examination

The physical examination should include a thorough cardiovascular examination, as well as evaluation for evidence of hyperlipidemia, hypertension, peripheral vascular disease, heart failure, anemia, thyroid disease and renal disease.

Investigations

Refer patients with suspected coronary artery disease to a hospital with specialist facility for further evaluation investigations.

Management

- Advise to continue beta-blockers as first-line medication(atenolol 50-100 mg daily);
- If beta-blockers are contraindicated, sustained release nitrates are the preferred alternative;
- Calcium channel blockers may be an alternative medication if the patient is unable to take beta-blockers or nitrates.(Amilodipin , nefedipine);
- ASA 85-100mg daily (unless contraindicated);
- Statins are indicated regardless of lipid levels;
- Evaluate and treat the modifiable risk factors (smoking, sedentary activity level, depression, hyperlipidemia, obesity, hypertension and diabetes.

Refer the patient for specialist evaluation if:

- undiagnosed/suspected CAD
- worsening chest pain despite above treatment
- symptoms/signs of heart failure(see details below)

- suspected acute coronary syndrome(see details below)
- abnormal heart rate or rhythm
- drug side effects (ex. Heart rate < 60 beats per minute in a patient taking beta-blocker)

4.7Acute Coronary Syndrome (ACS)

Acute Coronary Syndrome covers a range of conditions including:

1-unstable angina

2-ST-segment-elevation myocardial infarction (STEMI) and

3- non-ST-segment-elevation myocardial infarction (NSTEMI).

4.7.1 Initial Assessment and Referral to Hospital

Check immediately whether patient currently has chest pain. If pain free, check when their last episode of pain was, particularly if they have had pain in the last 12 hours.

Determine whether the chest pain may be cardiac, by considering:

- history of the chest pain
- presence of cardiovascular risk factors
- history of ischaemic heart disease and any previous treatment
- Previous investigations for chest pain

Initially assess patient for any of the following symptoms, which may indicate an ACS:

- pain in the chest and/or other areas (for example, the arms, back or jaw) lasting longer than 15 minutes;
- chest pain associated with nausea and vomiting, marked sweating, breath-

lessness, or particularly a combination of these;

- chest pain associated with hemodynamic instability (weak pulses, low blood pressure, cold clammy extremities, change in mentation, low urine output);
- New onset of chest pain, or abrupt deterioration in previously stable angina, with recurrent chest pain occurring frequently and with little or no exertion, and with episodes often lasting longer than 15 minutes.

4.7.2 Management:

- Complete rest in bed and give oxygen,
- Give aspirin 300 mg
- Beta-blockers if there is severe tachycardia or vasovagal reaction* (Atenolol 50mg)
- Secure intravenous access;
- Control pain with strong analgesia like opioids (Morphin or pethedine);
- Perform an immediate ECG, if available;
- Then refer immediately to a set up where there is an ICU.

*Due to pain (low BP, sweating, syncope, dizziness)

4.8 Stroke

4.8.1 Definition

Stroke is "Rapidly developing clinical signs of focal and at times global disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause than that of vascular origin", according to the World Health Organization (WHO), it is the third leading cause of death.

Transient Ischemic attack- TIA -focal neurological symptoms lasting less than 24 hours but fleeting symptoms may be associated with infarcts on CT or MRI. Most TIAs last 10 -15 minutes.

4.8.2 Classification

Stroke occurs as a result of ischemia or haemorrhage.

Ischaemic strokes

Ischemia accounts for about 80% of strokes worldwide and may be about 60-80% in Africa.

Ischemia is caused by thrombosis or embolism resulting in loss of blood supply to part of the brain. Ischeamic stroke are either atherosclerotic and cardioembolic.

Atherosclerotic ischemia: Hypertension, hyperlipidaemia, smoking are all risk factors for plaque formation and subsequent thrombosis.

Cardioembolic Ischemia can arise from valve disease- Mitral Atrial fibrillation, Acute or recent myocardial infarction.

Other less common causes:- HIV infection, venous sinus and cortical vein thrombosis and vasculitis.

Otherwise ischeamic stroke can also be lacunar or cryptogenic and of little interest to us here.

Hemorrhagic stroke

About 10-20% of strokes worldwide are caused by haemorrhage.

This percentage can reach as high as 40% in Africa may be due to untreated or poorly controlled hypertension in those who take medication. Hemorrhagic stroke happens due to sudden release of blood into the brain commonly due to high blood pressure.

The main types are:

- Intracerebral haemorrhage-ICH
- Subarachnoid haemorrhage-SAH

4.8.3 Assessment & Diagnosis

The main features of a stroke are a sudden onset of a focal neurological deficit in someone who was well. The clinical findings will depend on the: Type of stroke, the vascular territory affected, the underlying cause of the disease.

The most common presentations are sudden loss of:

- unilateral power or sensation in an arm or leg or both,
- speech, vision or balance
- Other symptoms include: Altered consciousness ,Dysphagia, Dysarthria, Ataxia, Diplopia, Quadriparesis

4.8.4 Management

Investigations used in strokes in primary, secondary or tertiary levels:

- *Complete blood count*
- *Coagulation profile PT, TT and INR*
- *RBS/FBS random or fasting blood glucose*
- *Urine analysis*

- *BUN & creatinine*
- *Liver function tests GOT, GPT, Alkaline phosphatase*
- *Electrolytes: Na, K, Ca, Mg, Cl*
- *Imaging modalities Chest X-ray CT scan MRI, Angiography*
- *EKG, Echocardiography*
- *CSF analysis in Subarachnoid haemorrhage*
- *Lipid profile: Triglycerides, total Cholesterol High and Low density lipoprotein*

Initial management of all strokes at primary care level

Consider transfer of patients immediately to a hospital facility when proper service is not available. Chronic management of patients requires physical therapy and rehabilitation and management of the risk factors for stroke. For the management of Hypertension, Diabetes and other risk factor see specific management principles in the guidelines.

Management: Emergency measures

- *Coma care-positioning, airway, oxygen, urinary catheter, NG tube*
- *Fluid management :2-3 litres of 0'9% NaCl (sodium chloride) per 24 hours rehydratewith 500 ml of normal saline for ischemic stroke*
- *No antihypertensive agent unless SBP> 180 mm Hg and*
- *Haemorrhagic stroke managed with rapid control of BP with Antihypertensive (Hydralazine, Nifedipine, Frusemide etc…)*
- *Enteral Nutrition on day 2 continuous infusion. Blood glucose goal 140-180 mg/dl.*

4.9 Heart Failure

4.9.1 Definition: A clinical syndrome arising from inability of the heart to pump adequate cardiac output or inability to fill with normal filling pressure. It can result from variety of functional or structural abnormality of the heart.

The manifestations arise either from inadequate cardiac output (fatigue, exercise intolerance) or from abnormal filling pressure (Dyspnea, orthopnea, body swelling).

New York Heart Association criteria (NYHA) is used to classify severity of heart failure.

New York Heart Association Classification (NYHA) Functional Classification	
Class I	No limitation during ordinary activity
Class II	Slight limitation during ordinary activity
Class III	Marked limitation of normal activities without symptoms at rest
Class IV	Unable to undertake physical activity without symptoms; symptoms may be present at rest.

PROGNOSIS

The development of symptomatic Heart Failure carries a poor prognosis. Community-based studies indicate that 30–40% of patients die within 1 year of diagnosis and 60–70% die within 5 years, mainly from worsening HF or as a sudden event (probably because of a ventricular arrhythmia).

Patients with symptoms at rest (New York Heart Association [NYHA] class IV) have a 30–70% annual mortality rate, whereas patients with symptoms with moderate activity (NYHA class II) have an annual mortality rate of 5–10%.

Thus, functional status is an important predictor of patient outcome.

4.9.2 Clinical features

- Breathlessness on exertion,
- Breathlessness on lying flat (orthopnea);

- Intermittent breathlessness at night (paroxysmal nocturnal dyspnea);
- Night cough, Tachypnea, Frothy blood-stained sputum,
- Lower chest crepitations;
- Swelling of the feet and lower extremities
- Abdominal distention and discomfort;
- Pitting pedal edema, Ascites,
- Tender hepatomegaly;
- Tachycardia, S3 gallop, Cardiac murmurs, displaced apex beat;
- Raised jugular venous pressure.

4.9.3 Diagnosis:

In suspected heart failure diagnostic tests are done to diagnose underlying structural or electrical cardiac abnormality, identify precipitating factors and aggravating factors. Initial laboratory studies should include complete blood count, comprehensive metabolic panel (including electrolytes, BUN, creatinine, calcium,magnesium, fasting glucose, and liver function tests), fasting lipid profile, urinalysis, Cardiac markers and thyroid function tests.

- Complete blood count: to check for Anemia or infection which can exacerbate pre- existing heart failure.
- Serum electrolytes, blood urea nitrogen, and creatinine may indicate associated conditions like hyponatremia or renal failure
- Liver function tests, which may be affected by hepatic congestion.
- Fasting blood glucose to detect underlying diabetes mellitus.
- Chest radiography should be performed to evaluate the presence of pulmonary edema or cardiomegaly, and rule out other etiologies of dyspnea (pneumonia, pneumothorax).
- An echocardiogram should be performed to assess LV function and structure, evaluate valvular heart disease, and exclude cardiac tamponade.

- Electrocardiography
    - *Most patients with heart failure (HF) with reduced ejection fraction have a significant abnormality on an electrocardiogram (ECG). A normal ECG makes systolic dysfunction unlikely (98 percent negative predictive value).*
    - *It is performed to look for evidence of ischemia (ST, T wave abnormalities), previous myocardial infarction (Q waves), conduction delays, and arrhythmias (supraventricular and ventricular).*

Not all patients require all of these investigations; an indication for each investigation is dependent on the kind of patients and clues from other simple investigations.

For Clinical diagnosis of heart failure the Modified Framingham clinical criteria is a very simple and useful tool with high sensitivity and fair specificity

Modified Framingham criteria for Congestive Heart failure (CHF)

Diagnosis of CCF requires the simultaneous presence of at least 2 major criteria or 1 major criterion in conjunction with 2 minor criteria.

Major criteria

- *Paroxysmal nocturnal dyspnoea*
- *Crepitations*
- *Acute pulmonary oedema*
- *Neck vein distention*
- *S3 gallop*
- *Hepatojugular reflux*
- *Cardiomegaly (cardiothoracic ratio >50% on chest radiography)*
- *Increased central venous pressure (>16cm H2O at right atrium)*
- *Weight loss ≥ 4.5kg in 5 days in response to treatment*

Minor criteria

- *Bilateral ankle edema*
- *Nocturnal cough*
- *Dyspnea on ordinary exertion*
- *Hepatomegaly*
- *Tachycardia (heart rate >120/min)*
- *Pleural effusion*
- *Decrease in vital capacity by 1/3 from maximum recorded*

Minor criteria are acceptable only if they cannot be attributed to another medical condition (such as pulmonary hypertension, chronic lung disease, cirrhosis, ascites, or the nephrotic syndrome).

The Framingham Heart Study criteria are 100% sensitive and 78% specific for identifying persons with definite congestive heart failure.

4.9.4 Management of Heart Failure

All patients presenting with symptoms and signs of heart failure should be referred to hospital level for making diagnosis and starting treatment.

Management of CHF consists of:

- *Treat the cause (e.g. arrhythmias; valve disease, MI, HTN).*
- *Treat exacerbating factors (anemia, thyroid disease, infection, raised BP).*
- *Avoid exacerbating factors, e.g. NSAIDS (fluid retention) and verapamil (–ve inotrope).*

Medications

In general, pharmacologic therapy in chronic HF is aimed at blocking the neurohormonal pathways that contribute to the progression of HF, and reducing symptoms, hospitalizations, and mortality.

The corner stone of medical therapy for HF includes ACE-Inhibitors, ARBs, vaso-

dilators, β-adrenergic blockade, digoxin and diuretic therapy for volume overload. Most patients require a multidrug regimen. (see appendix 5).

1. Diuretics: Diuretics can reduce the risk of death and worsening heart failure. Give loop diuretics to relieve symptoms, eg furosemide 40mg/24h PO. Increase dose as necessary. SE: K+ decrease, renal impairment.

   Monitor renal function tests and electrolytes and add K+-sparing diuretic (eg spironolactone) if K+ <3.2mmol/L, predisposition to arrhythmias, concurrent digoxin therapy (decreased K+ increases risk of digoxin toxicity), or pre-existing K+-losing conditions.

   If refractory edema, consider adding a thiazide, eg Hydrocholorothiazide 25-50mg /24h PO.

2. Angiotensin Converting Enzyme –inhibitors (ACE-i): Consider in all those with left ventricular systolic dysfunction; improves symptoms and prolongs life. If cough is a problem, an angiotensin receptor blocker (ARB) may be substituted (eg candesartan 4mg/d; max 32mg PO). SE: increased K+.

3. B-blockers (eg carvedilol, metoprolol) decrease mortality in heart failure. These benefits appear to be additional to those of ACE-i in patients with heart failure due to LV dysfunction.

   Initiate after diuretic and ACE-i. Use with caution: 'start low and go slow'; if in doubt seek specialist advice first (eg carvedilol 3.125mg/12h to 25–50mg/12h); wait ≥2weeks between each dose increment. Beta-blocker therapy in patients hospitalized with decompensated heart failure is associated with lower post-discharge mortality risk and improved treatment rates.

4. Spironolactone: Spironolactone (25mg/24h PO) decreases mortality by 30% when added to conventional therapy. Use in those still symptomatic despite optimal therapy as listed above. Spironolactone is K+-sparing, but there is little risk of significant hyperkalaemia, even when given with ACE-i.

5. Digoxin : helps symptoms even in those with sinus rhythm, and should be considered for patients with LV systolic dysfunction who have signs or symptoms of heart failure while receiving standard therapy, including ACE-i and B-blockers, or in patients with Atrial Fibrillation. Dose example: 0.125mg/24h PO if in sinus rhythm.

   Monitor renal function tests and electrolytes; maintain K+ at 4–5mmol/L.

Lifestyle/Risk Modification

- Dietary counseling for sodium and fluid restriction should be provided.
- Smoking cessation should be strongly encouraged.
- Exercise training is recommended in stable HF patients as an adjunct to pharmacologic treatment. Exercise training in patients with HF has been shown to improve exercise capacity, improve quality of life, and decrease neurohormonal activation.
- Treatment programs should be individualized and include a warm-up period, 20 to 30 minutes of exercise at the desired intensity, and a cool-down period 3 to 5 days a week Weight loss should be recommended when appropriate.

Once patients are stable they can be followed in health centers with refill of drugs. The following parameters should be looked at each follow up.

- Functional class of heart failure(NYHA)
- Weight
- Urine output and postural dizziness
- Blood pressure and pulse rate
- Drug side effects
- Creatinine and serum potassium every six month if available

Patients with worsening symptoms and laboratory tests, uncontrolled /new appearing risk factor should be referred.

4.10 Primary Prevention of Cardiovascular Disease

Intensive lifestyle interventions and appropriate drug therapy is required in the following:

- People with established cardiovascular disease (IHD, CHF, stroke etc…)
- Those without established CVD but have:

- a total cholesterol ≥ 8 mmol/l (320 mg/dl) or;
- low-density lipoprotein (LDL) cholesterol ≥ 6 mmol/l (240 mg/dl) or
- TC/HDL-C (total cholesterol/high density lipoprotein cholesterol) ratio >8;
- persistent raised blood pressure (>160–170/100–105 mmHg);
- diabetes;
- overt nephropathy or renal failure or renal impairment.

Instructions for using WHO/ISH risk prediction charts

- The WHO/ISH risk prediction charts indicate 10-year risk of a fatal or non-fatal major cardiovascular event (myocardial infarction or stroke),according to age, sex, blood pressure, smoking status, total blood cholesterol and presence or absence of diabetes mellitus.
- There are two sets of charts. One set can be used in settings where blood cholesterol can be measured. The other set is for settings in which blood cholesterol cannot be measured.
- The charts provide approximate estimates of CVD risk in people who do not have established coronary heart disease, stroke or other atherosclerotic disease.
- They are useful as tools to help identify those at high cardiovascular risk, and to motivate patients, particularly to change behavior and, when appropriate, to take antihypertensive, lipid-lowering drugs and aspirin.

How do you use the charts to assess cardiovascular risk? (See figure 1)

Before applying the chart to estimate the 10-year cardiovascular risk of an individual, the following information is necessary:

1- **Presence or absence of diabetes**

2- **Gender**

3- **Smoker or non-smoker** *(*All current smokers and those who quit smoking less than 1 year)

4- **Age**

5- **Systolic blood pressure** *(*mean of two readings on each of two occasions)

6- **Total blood cholesterol**(if in mg/dl divide by 38 to convert to mmol/l)

Once the above information is available proceed to estimate the 10-year cardiovascular risk as follows:

Step 1: Select the appropriate chart depending on the presence or absence of diabetes.

Step 2: Select male or female tables.

Step 3: Select smoker or non-smoker boxes.**Step 4**: Select age group box (if age is 50-59 years select 50, if 60-69 years select 60 etc.).

Step 4: Select age group box (if age is 50-59 years select 50, if 60-69 years select 60 etc.).

Step 5: Within this box find the nearest cell where the individuals systolic blood pressure

(mm Hg) and total blood cholesterol level (mmol/l) cross.

The colour of this cell determines the 10-year cardiovascular risk.

Please note that CVD risk may be higher than indicated by the charts in the presence of the following:

- Already on antihypertensive therapy
- Premature menopause
- Approaching the next age category or systolic blood pressure category
- Obesity (including central obesity)
- Sedentary lifestyle
- Family history of premature CHD or stroke in first degree relative(male< 55 years, female < 65 years)
- Raised triglyceride level (>2.0 mmol/l or 180 mg/dl)
- Low HDL cholesterol level (< 1 mmol/l or 40mg/dl in males, < 1.3 mmol/l or 50 mg/dl in females)
- Raised levels of C-reactive protein, fibrinogen, homocysteine, apolipoprotein B or Lp(a),or fasting glycaemia, or impaired glucose tolerance
- Microalbuminuria (increases the 5-year risk of diabetics by about 5%)
- Raised pulse rate
- Socioeconomic deprivation

Table 4.3: Recommendations for prevention of cardiovascular disease in people with cardiovascular risk factors (according to individual total risk) a

10-year risk of cardiovascular event <10%, 10 to <20%, 20 to <30%, ≥30%	
When resources are limited, individual counselling and provision of care may have to be prioritized according to cardiovascular risk.	
Risk <10%	Individuals in this category are at low risk. Low risk does not mean "no" risk. Conservative management focusing on lifestyle interventions is suggested.
Risk 10% to <20%	Individuals in this category are at moderate risk of fatal or non-fatal vascular events. Monitor risk profile every 6–12 months.
Risk 20% to <30%	Individuals in this category are at high risk of fatal or non-fatal vascular events. Monitor risk profile every 3–6 months.
Risk ≥30%	Individuals in this category are at very high risk of fatal or non-fatal vascular events. Monitor risk profile every 3–6 months.

a. Excluding people with established CHD, CeVD and peripheral vascular disease.

b. Policy measures that create conducive environments for quitting tobacco, engaging in physical activity and consuming healthy diets are necessary to promote behavioural change. They will benefit the whole population. For individuals in low risk categories, they can have a health impact at lower cost, compared to individual counselling and therapeutic approaches.

SMOKING CESSATION

All non-smokers should be discouraged from starting smoking.

All smokers should be strongly encouraged to quit smoking by a health professional and supported in their efforts to do so.

It is suggested that those who use other forms of tobacco be advised to stop.

DIETARY CHANGES

All individuals should be strongly encouraged to reduce total fat and saturated fat intake.

Total fat intake should be reduced to about 30% of calories; saturated fat to less than 10% of calories; transfatty acids intake should be reduced as much as possible or eliminated and most dietary fat should be polyunsaturated (up to 10% of calories) or monounsaturated (10–15% of calories).

All individuals should be strongly encouraged to reduce daily salt intake by at least one-thirds and, if possible, to <5 g or <90 mmol per day.

All individuals should be encouraged to eat at least 400 g a day of a range of fruits and vegetables as well as whole grains and pulses.

PHYSICAL ACTIVITY

All individuals should be strongly encouraged to take at least 30 minutes of moderate physical activity (e.g. brisk walking) a day, through leisure time, daily tasks and work-related physical activity.

WEIGHT CONTROL

All individuals who are overweight or obese should be encouraged to lose weight through a combination of a reduced-energy diet (dietary advice) and increased physical activity.

ALCOHOL INTAKE

Individuals who take more than 3 units of alcohol per day should be advised to reduce alcohol consumption.

c. One unit (drink) = half pint of beer/lager (5 % alcohol), 100 ml of wine (10 % alcohol), spirits 25 ml (40% alcohol)

ANTIHYPERTENSIVE DRUGS	
All individuals with blood pressure at or above 160/100 mmHg, or lesser degree of raised blood pressure with target organ damage, should have drug treatment and specific lifestyle advice to lower their blood pressure and risk of cardiovascular disease.	
All individuals with blood pressure below 160/100 mmHg, or with no target organ damage need to be managed according to the cardiovascular risk (10-year risk of cardiovascular event <10%, 10 to <20%, 20 to <30%, ≥30%).	
Risk <10%	Individuals with persistent blood pressure ≥140/90 mmHge should continue lifestyle strategies to lower blood pressure and have their blood pressure and total cardiovascular risk reassessed every 2–5 years depending on clinical circumstances and resource availability.
Risk 10% to <20%	Individuals with persistent blood pressure ≥140/90 mmHge should continue lifestyle strategies to lower blood pressure and have their blood pressure and total cardiovascular risk reassessed annually depending on clinical circumstances and resource availability.
Risk 20% to <30%	Individuals with persistent blood pressure ≥140/90 mmHge who are unable to lower blood pressure through lifestyle strategies with professional assistance within 4–6 months should be considered for one of the following drugs to reduce blood pressure and risk of cardiovascular disease: thiazide-like diuretic, ACE inhibitor, calcium channel blocker, beta-blocker. A low-dose thiazide-like diuretic, ACE inhibitor or calcium channel blocker is recommended as first line therapy. (1++, A)
Risk ≥30%	Individuals with persistent blood pressure ≥130/80 mmHg should be given one of the following drugs to reduce blood pressure and risk of cardiovascular disease: thiazide-like diuretic, ACE inhibitor, calcium channel blocker, beta-blockerd. A low-dose thiazide-like diuretic, ACE inhibitor or calcium channel blocker is recommended as first line therapy. (1++, A)

d. Evidence from two recent meta-analyses indicates that for treatment of hypertension, beta-blockers are inferior to calcium-channel blockers and ACE inhibitors in reducing the frequency of hard endpoints. In addition, beta-blockers are less tolerated than diuretics. Most of this evidence comes from trials where atenolol was the beta-blocker used.

e. Reducing blood pressure by 10–15/5–8 mmHg with drug treatment reduces combined CVD mortality and morbidity by about one-thirds, whatever the pretreatment absolute risk. However, applying this recommendation will lead to a large proportion of the adult population receiving antihypertensive drugs. Even in some high-resource settings, current practice is to recommend drugs for this group only if the blood pressure is at or above 160/100 mmHg.

LIPID-LOWERING DRUGS (STATINS)	
All individuals with total cholesterol at or above 8 mmol/l (320 mg/dl) should be advised to follow a lipid-lowering diet and given a statin to lower the risk of cardiovascular disease.	
All other individuals need to be managed according to the cardiovascular risk as follows (10-year risk of cardiovascular event <10%, 10 to <20%, 20 to 30%, ≥30%)	
Risk <10%	Should be advised to follow a lipid lowering diet.
Risk 10 to <20%	Should be advised to follow a lipid-lowering diet.
Risk 20 to <30%	Adults >40 years with persistently high serum cholesterol (>5.0 mmol/l) and/or LDL cholesterol >3.0 mmol/l, despite a lipid-lowering diet, should be given a statin.
Risk ≥30%	Individuals in this risk category should be advised to follow a lipid-lowering diet and given a statin. (1++, A) Serum cholesterol should be reduced to less than 5.0 mmol/l (LDL cholesterol to below 3.0 mmol/l) or by 25% (30% for LDL cholesterol), whichever is greaterf.
HYPOGLYCEMIC DRUGS	
Individuals with persistent fasting blood glucose >6 mmol/l despite diet control should be given metformin.	

f. Reducing cholesterol level by 20% (approximately 1 mmol/l) with statin treatment would be expected to yield a coronary heart disease mortality benefit of 30%, whatever the pretreatment absolute risk. However, applying this to the general population may not be cost-effective. It will lead to a large proportion of the adult population receiving statins. Even in some high-resource settings, current practice is to recommend drugs for this group only if serum cholesterol is above 8mmol/l (320 mg/dl).

ANTIPLATELETE DRUGS	
Risk <10%	For individuals in this risk category, the harm caused by aspirin treatment outweighs the benefits. Aspirin should not be given to individuals in this low-risk category.
Risk 10 to <20%	For individuals in this risk category, the benefits of aspirin treatment are balanced by the harm caused. Aspirin should not be given to individuals in this risk category.
Risk 20 to <30%	For individuals in this risk category, the balance of benefits and harm from aspirin treatment is not clearh. Aspirin should probably not be given to individuals in this risk category.
Risk ≥30%	Individuals in this risk category should be given low-dose aspirin.
DRUGS THAT ARE NOT RECOMMENDED	
	Hormone replacement, vitamins B, C, E and folic acid supplements are not recommended for reduction of cardiovascular risk.

h. Consider aspirin in areas where coronary heart disease rates exceed stroke rates.

4.11 Secondary Prevention of Cardio-vascular Disease

People with established cardiovascular disease (angina pectoris, coronary heart disease, myocardial infarction, transient ischaemic attacks, cerebrovascular disease (CeVD) or peripheral vascular disease (PVD) or after coronary revascularization or carotid endarterectomy) are at very high risk of developing recurrent cardiovascular events. Risk charts are not necessary to make treatment decisions in them.

The goal of applying the recommendations below is to prevent recurrent cardiovascular events by reducing their cardiovascular risk.

Table 4.4: Recommendations* for prevention of recurrent CHD (heart attacks) and CeVD (strokes) events

LIFESTYLE ADVICE
Intensive life style advice should be given simultaneously with drug treatment
SMOKING CESSATION
All individuals with established CHD and/or CeVD should be strongly encouraged to stop smoking by a health professional and supported in their efforts to do so. Cessation of other forms of tobacco use in individuals with established CHD and /or CeVD is recommended. Non-smoking people with CHD and/or CeVD should be advised to avoid exposure to second-hand tobacco smoke as much as possible.
DIETARY CHANGES
All individuals with CHD and/or CeVD should be given advice to adopt a pattern of diet which is likely to reduce the risk of recurrent vascular disease. Total fat intake should be reduced to < 30% of calories, saturated fat to < 10% of calories and transfatty acids should be reduced as much as possible or eliminated; most dietary fat should be polyunsaturated (up to 10% of calories) or monounsaturated (10–15% of calories). All individuals should be strongly encouraged to reduce daily salt intake by at least one-thirdss and, if possible, to <5 g or <90 mmol per day. All individuals should be encouraged to eat, at least 400 g a day, of a range fruits and vegetables, as well as whole grains and pulses.
PHYSICAL ACTIVITY
Regular light to moderate intensity physical exercise is recommended for all subjects recovering from major CHD events (including coronary revascularization). Supervised programmes of exercise should where feasible be offered to all subjects recovering from major CHD events and CeVD events.

WEIGHT CONTROL

In patients with cardiovascular disease who are overweight or obese, weight loss should be advised through the combination of a reduced energy diet and increased physical activity.

ALCOHOL INTAKE

Individuals who take more than 3 units of alcoholic per day should be advised to reduce alcohol consumption.

ANTIHYPERTENSIVE DRUGS

Blood pressure reduction should be considered in all patients with established CHD, particularly with a blood pressure level above 140/90 mmHg. Lifestyle factors (particularly high alcohol intake) should be addressed first and if blood pressure is still above 140/90 mmHg, drug treatment is indicated. When beta-blockers and ACEI (angiotensin converting enzyme inhibitors) cannot be given, or in cases where blood pressure remains high, treatment with a thiazide diuretic is likely to reduce risk of recurrent vascular events. A target blood pressure of 140/90 mmHg is appropriate.

Blood pressure reduction should be considered in all patients with previous TIA or stroke to a target of <140/<90mmHg. For older patients target of <150/90mmHg

LIPID LOWERING DRUGS

Treatment with statins is recommended for all patients with established CHD. Treatment should be continued in the long-term, probably lifelong. Patients at high baseline risk are particularly likely to benefit.

Treatment with a statin should be considered for all patients with established CeVD, especially if they also have evidence of established CHD.

Monitoring of blood cholesterol levels is not mandatory. Other lipid lowering agents are not recommended, either as an alternative to statins or in addition to them.

Treatment of diabetes mellitus

Secondary prevention of CHD, CeVD and PVD is important in patients with diabetes, whether type 1 or type 2. Refer to section on diabetes mellitus.

ANTIPLATELET DRUGS

All patients with established CHD should be treated with regular aspirin in the absence of clear contraindications. Treatment should be initiated early and continued lifelong.

All patients with a history of transient ischaemic attack or stroke presumed due to cerebral ischaemia or infarction should be treated with long-term (probably lifelong) aspirin in the absence of clear contraindications. Other antiplatlets like clopidogrel should be continued for the duration specified at specialist facility.

FOLLOWING MYOCARDIAL INFARCTION AN ACEI

ACE inhibitors are recommended in all patients following myocardial infarction, which should be initiated as early as possible and continued long-term, probably lifelong. The benefits of treatment are particularly great among patients with impaired left ventricular function.

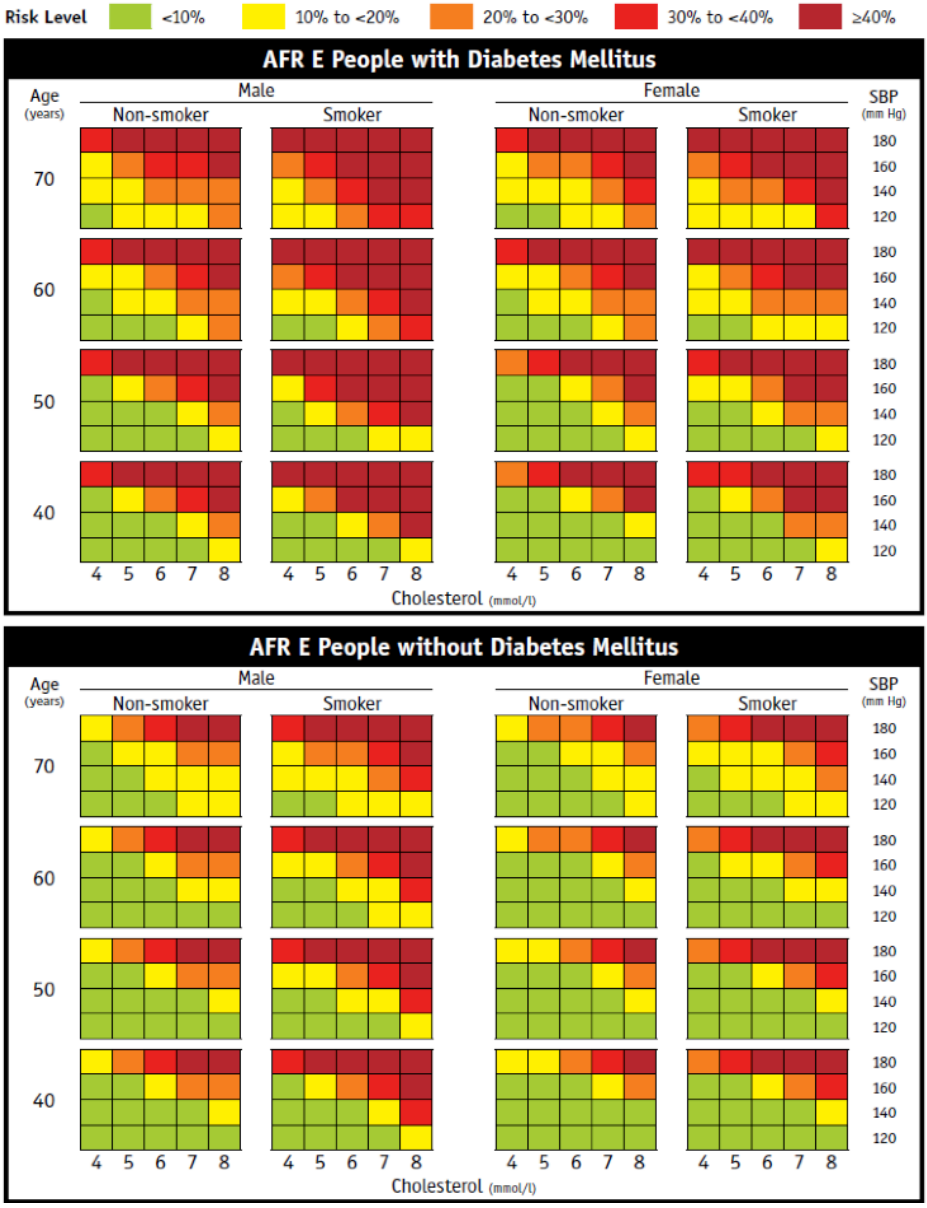
FOLLOWING MYOCARDIAL INFARCTION A BETA-BLOCKER

Treatment with beta-blockers is recommended in all patients with a history of myocardial infarction and those with CHD who have developed major left ventricular dysfunction leading to heart failure. Treatment should be continued for a minimum of 1–2 years after MI and probably lifelong, unless serious side effects occur.

ANTICOAGULANT TREATMENT

Refer patients with atrial fibrillation for anticoagulation.

Figure 4.3: WHO/ISH risk prediction chart for African region E (Including Ethiopia).10 years risk of fatal and non-fatal cardiovascular events according to age, gender, Systolic Blood pressure, smoking status, Presence or absence of Diabetes and cholesterol level




Risk Level
<10%
10% to <20%
20% to <30%
30% to <40%
≥40%
AFR E People with Diabetes Mellitus
Male
Female
Age (years)
Non-smoker
Smoker
Non-smoker
Smoker
SBP (mm Hg)
70
60
50
40
180
160
140
120
AFR E People without Diabetes Mellitus
Male
Female
Age (years)
Non-smoker
smoker
Non-smoker
smoker
SBP (mm Hg)
70
60
50
40
180
160
140
120

Chapter 5: Chronic Kidney Disease

5.1 Introduction

Chronic kidney disease is an important and common public health problem .It has a prevalence rate of 5 to 10% of the population. Adverse outcomes of chronic kidney disease can be prevented through early detection and treatment. Earlier stages of chronic kidney disease can be detected through routine laboratory measurements.

5.2 Definitions

Chronic kidney disease (CKD) is defined as abnormalities of kidney structure or function, present for >3 months, with implications for health, irrespective of the type of kidney disease.

1-Kidney tissue damage manifests in urine tests (casts), blood tests (Allbumin) or imaging studies (ultrasound) and may be with or without actual dysfunction of more than 3 months duration.

Example: elevated proteinuria, albuminuria and blood creatine/uria, Ultrasound Kidney size decrement demonstrate kidney tissue damage

2- Kidney dysfunction is expressed by estimated Glomerular filtration rate (eGFR) and change in this parameter of less than 60ml/mt/lt/1.7m2 with or without evidence of kidney damage for more than 3 months duration.

NB: eGFR calculated utilizing factors such as creatinine, age, gender and race (see eGFR formula below)

The eGFR in the Cockcroft Gault formula is calculated as follows:

$$GFR = \frac{(140-age)\times lean\ body\ weight(kg)}{Serum\ creatinine\ (mg/dl)\times 72}$$

The value is multiplied by 0.85 in women to account for the smaller muscle mass

5.3 Screening

The symptoms of CKD develop slowly. As a consequence, it remains largely asymptomatic. Screening for renal damage, or dysfunction and for the established risk factors remain important aspect of the effort to prevention and control of CKD in the individual cases. Laboratory testing using the presence of albumin or proteins in the urine have been good screening measures. Increasing amounts of albumin in the urine correlate directly with an increased rate of progression to end-stage kidney disease (and also correlate with cardiovascular morbidity & mortality). Reduction in the amount of albuminuria is associated with improved outcomes.

The International society of Nephrology (ISN) recommends population screening for proteinuria for early detection and prevention. Until the cost-effectiveness of this approach is validated, developing countries should focus on early detection of kidney damage or dysfunction in high risk groups such as diabetes, hypertension, and HIV.

Who are at risk?

Patients who have:

- high blood pressure
- diabetes
- have a family history of kidney disease
- have established cardiovascular disease
- obesity (body mass index ≥ 30)
- smoking habits
- reached 60 years or older

What tests for screening of renal damage or dysfunction?

- Proteinuria is an early and sensitive marker of kidney damage in many types of chronic kidney disease.
- Urine dipstick protein test is the simplest and most rapid test (but affected by concentration of urine, infection and epithelial contamination)
- 24 hour urine protein determination is better but cumbersome to manage.
- Micro-albuminuria refers to excretion of small but abnormal amounts of albumin, (requires recently developed, more sensitive laboratory methods and detects even earlier forms of injury to the kidneys).
- Urine Albumin to creatine ratio (ACR) accurately predicts renal and cardiovascular risks in population studies.
- Screening every1-2 years for the risk groups listed above (4).

5.4 Diagnosis and staging of disease

Identifying the presence and stage of chronic kidney disease in an individual is not a substitute for accurate assessment of the cause of kidney disease. Among individuals with chronic kidney disease, the stages are defined based on the level of kidney function. Defining stages of chronic kidney disease requires "categorization" of continuous measures of kidney function, and the "cut-off levels" between stages are inherently arbitrary. Nonetheless, staging of chronic kidney disease will facilitate application of clinical practice guidelines, clinical performance measures and quality improvement efforts to the evaluation, and management of chronic kidney disease.

Most people may not have any symptoms until their kidney disease is advanced. So, symptomatic detection may not be the best way of screening for risk of renal failure. The following features are helpful to diagnose advanced kidney disease:

- feel more tired and have less energy
- have trouble concentrating
- have a poor appetite

- have trouble sleeping
- have muscle cramping at night
- have swollen feet and ankles
- have puffiness around your eyes, especially in the morning
- have dry, itchy skin
- need to urinate more often, especially at night

Table 5.1: Stages of chronic kidney disease: A clinical action plan

Stage	Description	GFR (mL/min/1.73 m^2)	Action
	At increased risk	≥ 90	Screening CKD risk reduction
1	Kidney damage with normal or ↑↑GFR	≥ 90	Diagnosis and treatment. Treatment of comorbid conditions. Slowing of progression. Cardiovascular disease risk reduction.
2	Kidney damage with mildly ↓ GFR	60–89	Estimating progression.
3	Moderately ↓ GFR	30–59	Evaluating and treating complications.
4	Severely ↓ GFR	15–29	Preparation for kidney replacement therapy.
5	End-stage renal disease (ESRD)	< 15 (or dialysis)	Replacement (if uremia is present).

5.5 Task at primary level care

- screen for risk factors such as smoking, dyslipidemia, hypertension, diabetes, obesity, etc.
- Control modifiable risk factors.
- Patients with diabetes need urine protein dipstick test twice a year and creatinin determination annually.
- Palliative care for those evaluated and transferred back from secondary and tertiary centers
- All HIV infected individuals should be screened for proteinuria and those with positive test need ACE inhibitors and being classified as stage 4 also requires HAART regardless of CD4 count.
- Less cost of care

5.6 Indication for referral to tertiary level care

- Patients at risk for renal dysfunction (RFT and protienuria test every 2 years)
- Patients with hypertension, diabetes ,cardiac disease and Dyslipidaemia for renal function and proteinuria test annually
- Poorly-controlled hypertension and diabetes
- Patients with BP >160/100 and proteinuria of +2 should be reffered to secondary care for confirmation and creatine determination
- patients with obstructive uropathy (stone and BPH)
- Anyone with an acute presentation and signs of acute nephritis (oliguria, haematuria, acute hypertension and oedema) should be regarded as a medical emergency and referred without delay
- Persistent of dipstick proteinuria e.g. persistent 2+ proteinuria

- Glomerular haematuria with macro-albuminuria(albuminuria of >300mg/mmol)
- persistent albuminuria(urine ACR >30mg/mmol)eGFR< 30 mL/min/1.73m2
- A consistent decline in eGFR from a baseline of < 60 mL/min/1.73m2 (a decline 5mL/min/1.73m2 over a six-month period which is confirmed on at least three separate readings)

5.7 Prevention of CKD

1-Primary Prevention

- Control Diabetes
- Control Hypertension
- Control dyslipidemia
- Stop Smoking
- Be cautious with medicine ,including over the counter analgesia
- Step up regular Physical exercise
- Stop or cut Alcohol intake
- Maintain Healthy weight

(See Management of shared Risk factor in chapter 7.)

2-Prevention of Progression of CKD

- Early detection can help prevent the progression of kidney disease to kidney failure .
- Heart disease is the major cause of death for all people with CKD
- Hypertension causes and promotes the progression of CKD and CKD causes hypertension.

- Individualize BP targets and agents according to age, coexistent cardiovascular disease and other comorbidities, risk of progression of CKD, presence or absence of retinopathy.

- In both diabetic and non-diabetic adults with CKD and urine albumin excretion <30mg/24 hours (or equivalent*) whose office BP is consistently 140 mm Hg systolic or 90 mm Hg diastolic be treated with BP-lowering drugs to maintain a BP that is consistently 130 mm Hg systolic and 80 mm Hg diastolic.

- Early intervention with Angiotensin converting Enzyme inhibitors (ACE) or Angiotensin Receptor Blockers (ARB) can reduce progression and cardiovascular risk by up to 50%, and may also improve quality of life.

- It is recommended that both diabetic and non-diabetic adults with CKD and with urine albumin excretion of >30 mg/24 hours (or equivalent, whose office BP is consistently> 130 mm Hg systolic or >80mm Hg diastolic be treated with BP-lowering drugs to maintain a BP that is consistently<130 mm Hg systolic and' <80 mm Hg diastolic.

- It is recommended that an ARB or ACE-I be used in both diabetic and non-diabetic adults with CKD and urine albumin excretion 30-300 mg/24 hours (or equivalent.

- There is insufficient evidence to recommend combining an ACE-I with ARBs to prevent progression of CKD.

- Proteinuria should be reduced by 50% or more than 1 gm/day.

- It is recommended that in children with CKD, BP-lowering treatment be started when BP is consistently above the percentile for age, sex, and height.

- In children with CKD (particularly those with proteinuria), BP is lowered to consistently achieve systolic and diastolic readings less than or equal to the 50thpercentile for age, sex, and height, unless achieving these targets is limited by signs or symptoms of hypotension.

- ARB or ACE-I be used in children with CKD in whom treatment with

BP-lowering drugs is indicated, irrespective of the level of proteinuria.

End-stage renal disease (ESRD) management

It requires medical therapy and renal replacement therapy. Renal replacement therapy is dialysis and/ or kidney transplantation.

Palliative care:

It is needed for patients with ESRD who can't or are not suitable for renal replacement therapy. It relieves partly the anxiety and discomfort of the patient and the caretakers. It improves the quality of life of the patient.

Chapter 6: Cancer

6.1 Cancer Prevention

Cancer Prevention means eliminating or minimizing exposure to the causes of cancer, and includes reducing individual susceptibility to the effect of such causes. This approach offers the greatest public health potential and the most cost-effective long-term method of cancer control.

Tobacco is the leading single cause of cancer worldwide and in the fight against cancer every country should give highest priority to tobacco control.

Infection is the second common risk factor of cancer which can be prevented. Prevention not only focuses on the risks associated with a particular illness or problem but also on protective factors. Among prevention activities, emphasis should be placed on:

- Tobacco control;
- Infection prevention;
- Healthy diet;
- Physical activities and avoidance of obesity;
- Reducing alcohol use;
- Reducing carcinogenic occupational and environmental exposures;
- Immunization against hepatitis B virus;
- Vaccination/ immunization against HPV;
- Intervention against HIV;

- Health education, relating to sexual and reproductive factors associated with cancer.

The detailed preventive interventions of shared risk factors will be covered in the prevention section, chapter 7, while occupational factors and infectious diseases will be briefly discussed as risks to cancer.

Occupational and environmental factors

The magnitudes of occupational and environmental risks to cancer are not well known. It appears that occupational factors are responsible for about 5–10% of all cancers and that environmental factors are responsible for 1–2% of all cancers in industrialized countries. While it is essential to minimize occupational and environmental exposure to carcinogens, the level of public concern may well be disproportionate to the dangers.

Wherever occupational cancer hazards are found to exist, exposure standards that will minimize the risk to workers must be set. Cancer control programmes should encourage action at government level to prohibit: the importation of hazardous work practices that involve exposure to known carcinogens; and the dumping of hazardous waste in such a manner that drinking-water or air will become contaminated with carcinogens.

Prevention of Infectious Agents of Cancer

-Hepatitis B & C are the possible causes of Hepatoma—Vaccine for Hepatitis B is available; the Ministry of Health is also making efforts to make treatment available as a public health intervention in Ethiopia.

- Cervical cancer due to Human Papilloma virus can be prevented through effective vaccine.

-HIV is risk for NHL, cervical cancer, Kaposi sarcoma, conjunctival and anal cancer to which ART is proven protective and is available in Ethiopia.

-Helicobacter pylori in people with PUD can be detected and treated, eliminating risk of stomach cancer and Lymphoma.

6.2 Early Detection of Cancer

Increasing awareness of the signs and symptoms of cancer contributes to early detection of the disease in some cases. Where tests for cancer of specific sites are available, and facilities are appropriate, screening of apparently healthy individuals can disclose cancer in early or precursor stages, when treatment may be most effective. Early detection is recommended based on the observation that cancer control is effective when the disease is detected earlier in its natural history, prior to the development of symptoms, than in an advanced stage. The aim is therefore to detect the cancer when it is localized to the organ of origin without invasion of surrounding tissues or distant organs.

A decision to implement early detection of cancer in health services should be evidence-based, with consideration for the public health importance of the disease, characteristics of early-detection tests, efficacy and cost-effectiveness of early detection, personnel requirements and the level of development of health services in a given setting. Even if the costs of the screening tests are relatively low, the whole process may involve substantial expenses and may divert resources from other healthcare activities.

Early detection is only a part of a wider strategy that includes diagnosis, treatment of the condition detected, and follow-up. These activities need to be integrated at appropriate levels of health services, if early detection is to be sustained. Some specific additional investments in health services infrastructure may be required for the extra disease burden resulting from early detection. There are two principal components of early detection programmes for cancer: education to promote early diagnosis, and screening. Successful education leading to early diagnosis can result in substantial improvement in the health outcome of persons destined to develop cancer. Screening is unlikely to be successful unless based upon an effective education programme and effective treatment for the cancers detected.

Both approaches involve costs to the individual (in terms of time spent, distance travelled, cash payments for detection/diagnosis) and the health services (staff, subsidies for detection/diagnosis, treatment, follow-up), and sometimes may be associated with undesired harm. It is important to establish that benefits of early detection outweigh complications and harmful effects before early detection is implemented as a public health policy. National health services often operate with

limited resources against a wide variety of competing priorities. It is essential, therefore, to recommend for implementation only those interventions for which there is sufficient evidence on efficacy and cost-effectiveness.

6.3 Screening for Cancer

Screening is the presumptive identification of unrecognized disease or defects by means of tests, examinations, or other procedures that can be applied rapidly. National programmes should avoid imposing the "high technology" of the developed world on countries that lack the infrastructure and resources to use the technology appropriately or to achieve adequate coverage of the population. Many cancers, perhaps with the exceptions of the likes of lung, liver and esophagus have early warning symptoms and signs while only in breast and cervical cancer are these proved to be cost-effective aid to early treatment

Where the incidence of cancer justifies it, and the necessary resources can be made available, screening for cancers of the breast and cervix is recommended. This is feasible mainly in medium and high-resource level countries. Screening for other cancer sites must be regarded as experimental and cannot be recommended at present as public health policy.

Mass screening is not advisable in countries like Ethiopia where infrastructure is not well developed, because the psychosocial impact and effect of mass screening would be a disaster. Even though the advantage of early detection is so obvious, the problem will be magnified if we do not prepare treatment site and capacity for late stage patients.

The selection of screening programmes will be based on the following:

- The target disease should be a common form of cancer, with high associated morbidity or mortality and with public health importance;
- Effective treatment, capable of reducing morbidity and mortality, should be available;
- Test procedures should be ethical, safe, and relatively inexpensive;
- Sensitivity – the effectiveness of a test in detecting a cancer in those who

have the disease;

- Specificity – the extent to which a test gives negative results in those that are free of the disease;
- Positive predictive value – the extent to which subjects have the disease in those that give a positive test result;
- Negative predictive value – the extent to which subjects are free of the disease in those that give a negative test result;
- Acceptability – the extent to which those for whom the test is designed agree to be tested;
- The natural history of the condition is understood and there is an unsuspected but detectable (pre-clinical) stage;
- Adoption and implementation of the screening, diagnostic and intervention practices will strengthen development of the health system and overall societal development in a manner consistent with the principles of primary healthcare.

Clear and practical recommendations on the following

- The frequency of screening and ages at which screening should be performed;
- Quality control systems for the screening tests;
- Defined mechanisms for referral and treatment of abnormalities;
- An information system that can:
  - send out invitations for initial screening;
  - recall individuals for repeat screening;
  - follow those with identified abnormalities;
  - monitor and evaluate the programme.

Cervical cancer screening

Visual acetic acid inspection (VIA) shall be undertaken in primary and secondary care centers. (Please, refer the national cervical cancer screening and management guidelines.)

Breast cancer screening

Breast cancer screening is intrinsically less effective than cytological screening for cervical cancer. The national cancer control programme encourages early detection of breast cancer, especially for women above 18 years who are attending primary healthcare centres or hospitals for other reasons, by offering clinical breast examinations to those concerned about their breasts and promoting breast self-awareness in the community. Efforts will be made to prepare a setup to able to diagnosis breast cancer (core biopsy, histo-chemistry, hormonal status, ultra sound and mammogram) in every tertiary hospital. Mammography should not be introduced for screening unless the resources are available to ensure effective and reliable screening of at least 70% of the target age group, that is, women over the age of 50 years.

6.4 Diagnosis

Cancer diagnosis calls for a combination of careful clinical assessment and diagnostic investigations. Once a diagnosis is confirmed, it is necessary to ascertain cancer staging to evaluate the extension of the disease and be able to provide treatment accordingly. It is essential to educate people to recognize the early signs and symptoms of cancer. They should understand that cancer, when diagnosed early, is far more likely to be treatable, and to respond to effective treatment. They should appreciate the possible significance of lumps, sores, persistent indigestion or cough, and bleeding from the body's orifices, and the importance of seeking prompt medical attention if any of these occur. The cancers amenable to early diagnosis are breast and cervical cancer; in addition to that head and neck, skin, and prostate cancers can be diagnosed early. Others such as cancers of the ovary, urinary bladder, stomach, colon/ rectum and brain need additional investigations and procedures such as CT scan, MRI, endoscopy and laparoscopy which are not widely available.

Substantial endeavors may be needed in many cultures to dispel the myths, fears and gloom that tend to accompany any consideration of cancer. Otherwise, it is unlikely that the majority of those at risk for cancer will take effective prompt action. A high proportion of cancers that are relatively curable in developed countries are detected only at advanced stages in developing countries. It is reasonable to assume, therefore, that increased awareness among physicians, allied healthcare workers, and the general public in developing countries, combined with prompt and effective therapy, could have a major impact on the disease. There is evidence that prompt action, combined with the availability of effective treatment, resulted in improvements in both the stage of cancer at presentation and mortality from cancer of the cervix in developed countries in the last half of the 20th century (Ponten et al., 1995). A similar pattern has become evident more recently in rural India (Jayant et al., 1998).

Professional education of primary healthcare workers is essential. Such workers are at the forefront of the initial contact between possible cancer patients and the medical care system, and they must be aware of the signs and symptoms of early cancer, even though their prior training may have only exposed them to advanced and often untreatable cancers. This means that they must be systematically trained in the early detection of certain cancers, so that they are alert to the signs and symptoms of early cancer, and they must be given sufficient time to carry out such responsibilities. Further, it may be necessary to improve peoples' accessibility to trained health workers who are competent in performing the necessary examinations (including female health workers for women).

- If the majority of common cancers (for example, cervix, breast, head and neck, skin) are advanced at presentation (that is, stage III or IV), trained workers should promote measures for earlier diagnosis and referral. Early diagnosis, referral, and treatment of these cancers are of far greater prognostic importance than any attempts to treat the disease in its late stages.

6.5 Treatment

Cancer treatment aims at curing, prolonging useful life and improving quality of life. Treatment of any cancer must be treated in Multidisciplinary approach, which must including a pool of professionals consisting of Oncologists, Pathologists, Radiologists, Surgeon or Gynecologist, Pediatrician, and Social workers. Treatment services should give priority to early detectable tumors and potentially curable cancers. In addition, treatment approaches should include psychosocial support, rehabilitation and close coordination with palliative care to ensure the best possible quality of life for cancer patients.

It is important to underscore the close link between early detection and treatment. An excellent screening programme would be inappropriate without effective treatment measures. Similarly, it is not useful to develop treatment capacity without encouraging early detection. The application of effective treatment policies requires a "team" approach in which social workers and family members, as well as healthcare professionals, provide specific and supportive care for patients with cancer. Education of the patient and family members should thus be considered as components of the management of cancer.

Guidelines for treatment of each stage of cancer should be established, based on realistic estimates of the chance of cure, as well as the availability of resources. For example, in early cervical cancer, since there is no evidence to show whether surgery or radiotherapy produces a better outcome, the recommended treatment may depend upon the availability and expected use of surgical and radiotherapy resources for other major tumours in the region. Even when a particular method of treatment has been shown to be superior, a less effective method might still be legitimately chosen if it leads to more efficient overall use of resources and ultimately to greater success in saving lives or improving the quality of life. At all times, allocation of resources should give precedence to patients with the highest potential for cure over those with incurable or probably incurable tumours, who should be identified for palliative care.

Principles

- The main goals of a treatment programme are to cure or considerably prolong the life of cancer patients and to ensure the best possible quality of life to cancer survivors.

  Treatment services should initially target all patients presenting with curable tumours. If more resources are available, the programme should be extended to include patients with the common cancers that are treatable but not curable.

- Effective treatment services use a multidisciplinary approach and are integrated into the existing health system. Services are usually best developed at the secondary and tertiary levels as they are often costly, requiring specialized staff, infrastructure and procedures. The target population for treatment according to the WHO's estimate for Ethiopia is 60,000 new cancer patients. There are 5 regional oncology centers under construction in five teaching hospitals located in different regions: Jimma, Hawassa, Haromaya, Mekelle and Gondar. There is ongoing specialty training in Oncology (Adult, Pediatrics, and Gynecology and Hematology) at School of Medicine, Addis Ababa University. Training of health professionals like Oncology Nurses and Radiotherapists has already been started. This will improve access to cancer treatment. There is also a plan to expand chemotherapy services for breast cancer patients in general and tertiary hospitals in the country. Staff, including GPs, nurses and specialists, will also be trained in providing chemotherapy to breast cancer patients.

- Although the basic principles of cancer treatment are the same throughout the world, the specific treatment approaches adopted in each country should take into account cost-effectiveness, affordability, and social and ethical aspects. Services should, however, always be provided in an equitable and sustainable manner.

- Health professionals caring for cancer patients need to be prepared to decide, in consultation with the patient, when therapeutic measures to cure or prolong life are no longer likely to be beneficial to the patient and to institute palliative care instead (see Palliative care module).

- Treatment involves not only managing all aspects of the cancer itself, but also the psychosocial and rehabilitation needs of the patients and their families. Psychosocial support is particularly important because, in many countries, cancer is greatly feared and stigmatized.

The primary goals of cancer treatment are:

– Cure;

– Prolongation of life;

– Improvement of quality of life.

Cure in this instance is defined as the attainment of normal life expectancy and has three important components:

– Recovery from all evidence of disease (complete remission);

– Attainment of a stage of minimal or no risk of recurrence or relapse;

– Restoration of functional health (physical, developmental and psychosocial).

The principal methods of treatment are surgery, radiotherapy, chemotherapy (including hormonal manipulation), and psychosocial support. Surgery and radiotherapy are suitable for local and regional disease, and may affect cures in the early stages of cancer, especially when there is an early detection policy while chemotherapy may be applied in advanced forms.

Primary care level

- Early referral of suspicious cases, simple surgical procedures (e.g. cryotherapy of pre-cancerous lesions of the cervix);

- Retrieval of patients who abandon treatment, patient support groups, patient education and rehabilitation, education and training of community caregivers including traditional healers.

6.6 Recommendations for Referral of Suspected Breast Cancer at Primary Healthcare

What are the signs and symptoms in women presenting at PHC that could lead to referral of suspected breast cancer to specialized services?

- Breast lump
- Bloody nipple discharge

Women who report any breast symptoms at PHC should undergo physical examination of both breasts, both axillae, and the neck prior to referral.

- Women with a palpable breast lump, unilateral spontaneous nipple discharge (particularly bloody discharge), or any change in the shape or consistency of the breast, whether or not associated with other symptoms or risk factors, should be referred to a facility where diagnosis, staging, and treatment of breast cancer can be efficiently carried out as indicated below:

- Women **aged 30 years and above** with a breast lump, unilateral spontaneous nipple discharge (particularly bloody discharge), skin changes such as eczematous changes in or around the nipple or areola, skin tethering, and skin or nipple retraction should be referred for further investigations to rule out breast cancer.

- Women **under the age of 30 years** with a breast lump should only be referred for further investigations if the lump enlarges or has other features associated with cancer (such as fixed or hardness or the presence of skin changes) or in whom there are other reasons for concern, such as a family history of breast cancer, former breast cancer or prior therapeutic chest irradiation. Women with any other symptom highly indicative of advanced breast cancer (such as a large lump in the breast, skin ulceration, axillary swelling, palpable axillary nodes, swelling in the neck, severe back pain) should also be referred to a specialized centre for diagnosis and appropriate care.

- Women found with no abnormalities upon physical examination should

be taught breast awareness. This comprises educating them on breast cancer signs and symptoms, encouraging them to be aware of their normal breast and of any changes by periodic self-palpation, as well as empowering them to seek care promptly in case of any future breast abnormalities.

In making a recommendation to the patient for further investigation in specialized services, it should generally be emphasized that the likeliest possibility is that the lump is not a cancer. Benign breast diseases such as fibroadenoma, fibroadenosis, mastitis, abscess, benign cystic disease of the breast, and other rare diseases may also present with a lump in the breast. However, it is important to undergo further investigation because in the event cancer is diagnosed, treatment outcome is much better when the cancer is detected early and treated properly.

Chapter 7: Risk Factors for Non-communicable Diseases

7.1 Tobacco Control

7.1.1 Introduction

Smoking, the major single known risk factor for non-communicable diseases, is widespread around the world. The World Health Organization (WHO) estimates that about 30% of the adult male global population smokes. National smoking prevalence among men in sub-Sahara Africa varies from 20% to 60% and the annual cigarette consumption rates are on the rise for both men and women.

Smoking is estimated to cause about 71% of lung cancer cases, 42% of chronic respiratory diseases and nearly 10% of cardiovascular diseases and stroke. It is responsible for 12% of male deaths and 6% of female deaths in the world. Methods of consuming tobacco products include inhalation, smoking, chewing, snuff, sucking. Smokeless tobacco, which is consumed in un-burnt form through chewing and snuffing, contains several carcinogenic compounds and has been associated with oral cancer, hypertension, heart disease and other conditions.

A 2000 report by the US Surgeon General emphasized that smoking cessation is considerably more cost- effective than most healthcare interventions. This implies that, with time, other healthcare systems will benefit from resources saved by the introduction of smoking cessation into healthcare systems.

Implementing the FCTC

Ethiopia has been actively involved in all meetings related to the WHO Framework Convention on Tobacco Control (FCTC) and accordingly Ethiopia is signatory to this convention which was signed on February 25, 2004. Ethiopia ratified

the FCTC in 2014 and detailed directives have been developed by FMHACA. Efforts should be made to implement the directives developed by EFMHACA. Some of the key directives that need to be implemented include:

- protection from exposure to tobacco smoke;
- regulation of the contents of tobacco products and tobacco product disclosures;
- packaging and labeling of tobacco products;
- prohibition of tobacco advertising, promotion and sponsorship, and
- prohibition of sales of tobacco products to minors.

In order to implement Article 14 of the WHO Framework Convention on Tobacco Control FMoH and RHBs are expected to collaborate with FMHACA and PFSA in order to facilitate accessibility and affordability for treatment of tobacco dependence including pharmaceutical products pursuant to Article 22. FMoH and RHBs are also expected to endeavor to establish healthcare facilities and rehabilitation centers with programs for diagnosing, counseling, preventing and treating tobacco dependence. Yet many healthcare providers lack the proper tools to treat tobacco dependence.

Purpose of Guidelines

The purpose of this Clinical Practice Guidelines is to make accessible to all healthcare providers evidence-based treatment for tobacco use and dependence, and to provide appropriate treatment for all tobacco users.

Objectives of the Guidelines

General

1, To provide tobacco cessation guidelines

Specific objectives

2, To outline importance of cessation of tobacco use

3, To elaborate on evidence based tobacco cessation protocols

7.1.2 Tobacco Dependence

Tobacco dependence is an important factor that has to be assessed at the initiation of a smoking cessation program. The Fagerstrom questionnaire for Nicotine Dependence (FTND) is a widely used and researched short questionnaire. The information can be obtained in an interview or the smokers can fill in the questionnaire themselves. The score ranges from 0–10 and the average of representative samples of smokers is usually in the range of 3–4 points. The two most important questions to answer are time to first cigarette in the morning and number of cigarettes per day. Just these two questions give almost as much information as the whole questionnaire. Recently, it has been suggested that the best indicator of dependence is time to first cigarette; another strong, but relatively infrequent, indicator of dependence is nocturnal smoking.

WHO and American Psychiatric Association recognize nicotine as being an addictive drug, which leads to dependence and has a chronic relapsing tendency. Nicotine is readily absorbed from the respiratory tract, buccal mucosa and skin. Cigarettes are a highly effective mechanism for delivering nicotine. Inhaled nicotine takes about 10-19 seconds to reach the brain when administered through the pulmonary circulation.

Nicotine Withdrawals

The DSM-IV criterion for nicotine withdrawal includes the following: depressed mood, insomnia, irritability, frustration, anger, anxiety, craving, difficulty in concentration, restlessness, decreased heart rate and increased appetite or weight gain. To meet the diagnostic criteria for nicotine withdrawal the following must also apply: the symptoms cause clinically significant distress, are not due to a general medical condition and are not accounted for by another medical disorder. Nicotine withdrawal symptoms typically resolve over 10 to 14 days but can last up to 4 weeks and associations that cause the person to think about smoking can persist for years.

Fagerstrom test

The Fagerstrom Test for Nicotine Dependence is a standard instrument for assessing the intensity of the physical addiction to nicotine. This test helps clinicians document the indications for prescribing medication for nicotine withdrawal. The

higher the Fagerstrom score, the more intense is the patient's physical dependence on nicotine. Higher scores indicate that treatment of withdrawal symptoms, in most cases nicotine replacement therapy will be an important factor in the patient's plan of care.

Table 7.1: Fagerstrom test

The Fagerstrom Test	
How soon after you wake up do you smoke your first cigarette?	After 60 minutes (0) 31-60 minutes (1) 6-30 minutes (2) Within 5 minutes (3)
Do you find it difficult to refrain from smoking in places where it is forbidden?	No (0) Yes (1)
Which cigarette would you hate most to give up?	The first in the morning (1) Any other (0)
How many cigarettes per day do you smoke?	10 or less (0) 11-20 (1) 21-30 (2) 31 or more (3)
Do you smoke more frequently during the first hours after awakening than during the rest of the day?	No (0) Yes (1)
Do you smoke even if you are so ill that you are in bed most of the day?	No (0) Yes (1)

Interpretation of the Score:

SCORE	NICOTINE DEPENDENCE
0	No Dependence
1-2	Low Dependence
3-5	Moderately Dependent
6-8	Highly Dependent
9-10	Very Dependent

7.1.3 Benefits of Quitting

When smokers stop smoking, the body begins to heal almost immediately. Quitting smoking immediately reduces risks for cardiovascular disease and cancer including: cancers of the esophagus, larynx, kidney, pancreas, and cervix.

Table 7.2: benefits of quitting

Beneficial health changes that take place	Time since quitting
Your heart rate and blood pressure drop.	Within 20 minutes
The carbon monoxide level in your blood drops to normal.	12 hours
Your circulation improves and your lung function increases.	2-12 weeks
Coughing and shortness of breath decrease.	1-9 months
Your added risk of coronary heart disease is about half that of a smoker's.	1 year
Your stroke risk is reduced to that of a non-smoker 5 to 15 years after quitting.	5 years
Your risk of lung cancer falls to about half that of a smoker and your risk of cancer of the mouth, throat, esophagus, bladder, cervix, and pancreas decreases.	10 years

Other benefits include: improved fertility, whiter teeth, better breathing, healthier loved ones, increased energy, and better sex

Barriers to quitting

Concerns or barriers to quitting are important for all smokers. An informed discussion can be very helpful to assist smokers to overcome these, by providing information and correcting misconceptions. The common barriers to quitting include: withdrawal symptoms and cravings, stress, fear of failure, peer /social pressure and weight gain.

7.1.4 Different Interventions

Smoking cessation interventions are less costly than other routine medical interventions such as treatment of mild to moderate high blood pressure, cancer and other diseases; which can be associated with tobacco use. Clinicians should provide counseling interventions for patients who use tobacco. Smoking cessation programs often combine drug treatment and behavioral support (such as psychological interventions, telephone support, and self-help). Before deciding on which intervention to use, it is essential to document tobacco use status and conduct screening.

Evidence supports three main categories of intervention: healthcare professional brief opportunistic advice to stop smoking, face-to-face behavioral support and pharmacotherapy, especially nicotine replacement therapy (NRT) and bupropion.

There is strong evidence that face-to-face behavioral support -individual and in groups- is as effective as pharmacotherapy. The evidence so far suggests that individual and group support have similar effectiveness.

7.1.5 Behavioral/Cognitive Interventions

Tobacco dependence is a chronic condition that often requires repeated interventions, it is essential that health professionals provide ongoing counseling, support and appropriate pharmacotherapy. An estimated 70% of smokers see a physician each year, providing medical doctors with the opportunity to influence smoking behavior. Approximately 70% of smokers worldwide report that they want to quit; however, only one-thirds of them try to stop smoking each year, and fewer than 5–6% are successful in the long-term when they attempt to quit on their own. Physicians must appreciate that tobacco use has complex physiological and psy-

chological determinants and they therefore need to be familiar with the spectrum of effective therapies. Some of these effective therapies include:

a. Individual behavioral counseling

This is a patient-centered approach that enhances an individual's motivation for change through self-examination and identification of ambivalence to change and the subsequent resolution leading to sustained positive behavior change. Normally sessions are weekly for a period of at least 4 weeks before the planned quit date. Individual behavioral counseling can include advice regarding how to systematically quit.

b. Group behavior therapy

The chances of quitting are doubled for those who attend group behavioral programs compared with those who receive self-help material but no face-to-face behavioral support.

c. Telephone counseling/Quit lines

Three or more calls have been shown to have a greater benefit than 1 or 2 interactions. Telephone counseling may be a good option for people with poor or limited financial resources. It can reach large numbers without medical referral and can be incorporated as a part of smoking cessation service.

d. Self-help interventions

Self-help materials include manuals leaflets, videos/DVDs, audio recordings or Internet-based materials or structured programs that are used by individuals without the help of health professionals. These self-help materials may be aimed at smokers in the general population or target particular populations such as those with long-term conditions or pregnant women. Current evidence suggests there is likely to be a small effect from the use of standard self-help materials on quit rates compared with no intervention.

e. Brief therapy

Brief interventions, is the focused application of therapeutic techniques specifically targeted to a symptom or behavior and oriented toward a limited length of treat-

ment. Brief interventions are a useful component of a full spectrum of treatment options; particularly, valuable when more extensive treatments are unavailable or a client is resistant to such treatment.

7.1.6 The 5As model of brief therapy

The 5As

The tobacco cessation research literature strongly supports the use of a comprehensive, clinic-based approach to tobacco cessation, known as the 5A's— ask, advise, assess, assist, and arrange follow-up. Even though rates of performance of the ask, assess, and advise components of the 5A's model are increasing, the most effective components of the model, offering assistance and arranging for follow-up, are far less common.

The following steps are recommended as the "5 As" for effective intervention for smoking cessation in current smokers.

Step 1: ASK (identify the smokers).

The first step in treating tobacco use and dependence is to identify smokers. Healthcare professionals have to ask the patient about smoking at every clinic visit. This can be done effectively by expanding the number of vital signs to include smoking status in the patient's notes for each patient at every clinic visit. Two questions are important: whether the person smokes currently, has smoked in the past, and, if so, whether he/she is currently interested in stopping.

Step 2: ADVICE (give advice).

Smokers should be advised of the benefits of stopping smoking and the health risks of continuing smoking. Brief counseling interventions should be offered at every visit to maximize the patient's chances of a successful attempt. It is important that the clinician helps smokers to understand smoking implications in a personalized manner.

Include FRAMES (personalized Feedback, personal Responsibility for change, provide Advice, a Menu of options, express Empathy, and build Self-efficacy).

Step 3: ASSESS (assessment of motivation to quit smoking).

One important step in the process of stopping smoking is to identify the motivated quitters and assist them to stop smoking. The following three questions will help health professionals to recognize motivated quitters and get them started on an appropriate action plan:

1. Does the patient want to stop smoking?

2. How important is it for the patient to stop smoking?

3. Would the patient be prepared to stop smoking in the next 2 weeks?

Clinicians have to provide appropriate information regarding the acute and long-term risks of smoking and also the potential benefits of stopping smoking, while highlighting those that are the most relevant to the patient.

The 5Rs motivational intervention (described below) should be repeated every time an unmotivated patient visits the clinic. In the case of smokers who have failed in a previous quit attempt, reinforcement is needed to reassure them that most people make repeated quit attempts before they are successful.

Step 4: ASSIST (aid the smoker in quitting).

If the smoker does want to stop, the clinician has to help him with a plan to quit. The following points have to be covered:

1. Set a quit date, ideally in 2 weeks (try to find a "special day" for commitment, to quit completely and abruptly).

2. Provide practical counseling and skills training (*e.g.* review past quit experience and learn from it. What helped? What factors were related to relapses?).

3. Discuss possible nicotine withdrawal symptoms and how the patient can successfully overcome them, particularly during the critical first few weeks.

Identify other problems and plan how to cope with them.

- Ask family and friends for support (particularly a spouse or partner).
- Make a personalized action plan with treatment recommendations.
- Information relating to how to stop can be reinforced with leaflets, booklets or other self-help materials.

Triggers or any challenges in an upcoming attempt should be anticipated; for example, smoking friends or drinking alcohol is highly associated with relapses and the smoker should consider limiting or abstaining from alcohol or smokers during the quit process.

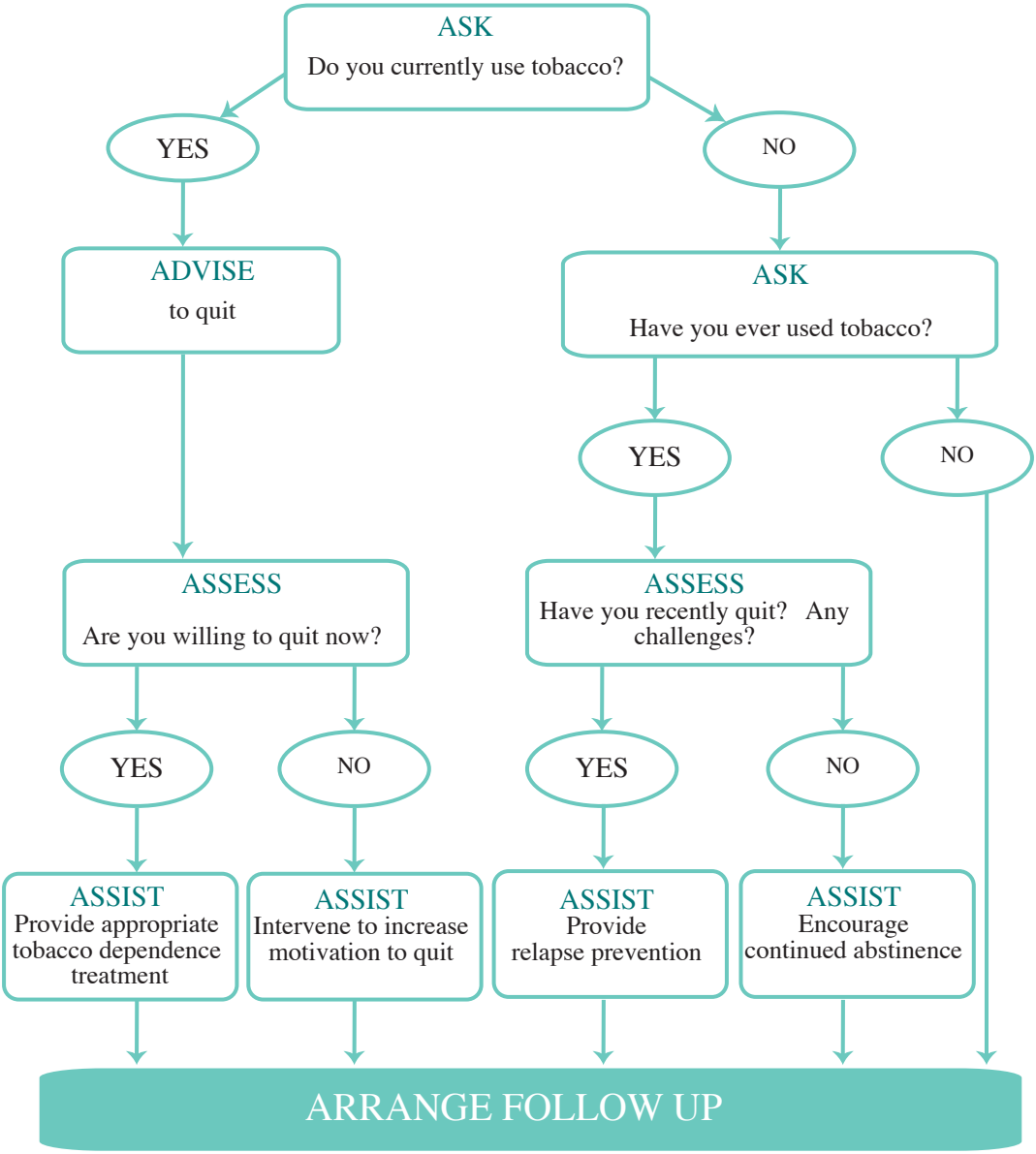
Step 5: ARRANGE (arrange a follow-up contact).

Follow-up is important in maintaining motivation and in providing continuing support. For some smokers, referral to a specialist smoking cessation clinic will be appropriate.

Follow-up visits should occur soon after the initiation of the smoking cessation intervention near the quit date, preferably during the first week, with a second visit within the first month. More frequent contact or visits (ideally weekly) are needed to assess the responsiveness to pharmacological treatment, to consider the use of more intensive treatment or to monitor possible side-effects of medications. Telephone contact may also be helpful. At each follow-up, contact success should be congratulated, and problems and difficulties should be identified to help facilitate the patient's attempt. Further follow-up contacts are also essential for support to prevent relapses. Ideally, cessation should be validated in 1 month and then again in 3, 6 and 12 months.

FIG 7.1: Algorithm Summarizing Management of Tobacco Smoking for Adults

Attending Primary Care (1)



Screening, Brief Intervention and Referral to Treatment (SBIRT) for Tobacco (Nicotine) Dependence

Table 7.3: The "5 A's" model for treating tobacco use and dependence (1)

Ask about tobacco use.	Identify and document tobacco use status for every patient at every visit.
Advise to quit.	In a clear, strong and personalized manner urge every tobacco user to quit.
Assess willingness to make a quit attempt.	Is the tobacco user willing to make a quit attempt at this time?
Assist in quit attempt.	For the patient willing to make a quit attempt, offer or refer for counseling or additional treatment to help the patient quit. For patients unwilling to quit at the time, provide interventions designed to increase future quit attempts.
Arrange follow up.	For the patient willing to make a quit attempt, arrange for follow-up contacts, beginning within the first week after the quit date. For patients unwilling to make a quit attempt at the time, address tobacco dependence and willingness to quit in the next clinic visit.

7.1.7 The Five R's Motivational Intervention

The 5R's: Relevance, Risks, Rewards, Roadblocks, Repetition (to increase motivation of patients who are not ready to quit). Tobacco users may be unwilling to quit due to misinformation, concern about the effects of quitting, or demoralization because of previous unsuccessful quit attempts. Therefore, after asking about tobacco use, advising the tobacco user to quit, and assessing the willingness to make a quit attempt, it is important to provide the 5R's motivational intervention.

Relevance – How is quitting most personally relevant to you?

Risks – What do you know about the risks of smoking in that regard?

Rewards – What would be the benefits of quitting in that regard?

Roadblocks – What would be difficult about quitting for you?

Repetition – Repeat assessment of readiness to quit; if still not ready to quit, repeat intervention at a later date.

7.1.8 Pharmacological interventions

Medications are important and effective tools for increasing cessation success by relieving nicotine craving and withdrawal symptoms.

Varenicline

Varenicline (Chantix, Champix) is an orally administered alpha4beta2 nicotinic acetylcholine receptor partial agonist that is indicated as an aid to smoking cessation. Varenicline is said to operate in two ways. Acting as an "antagonist", it blocks nicotine's connection to receptors in the brain, making smoking less satisfying and/or desirable. At the same time, as an "agonist", Varenicline mimics the effects of nicotine, reducing the ex-smoker's cravings and withdrawal. Chantix is usually started one to two weeks before the quit date. If nausea is experienced during this period, one should try to reduce smoking as much as possible, and quit as soon as one can – one does not need to wait a full two weeks if you're ready to quit before then.

Varenicline should be taken with food and water (at least one full glass) at each dose, and one should remain well hydrated throughout the day. If lapses occur, current dose should be continued as well as efforts to quit smoking. It is taken for 12 weeks:

-0.5mg daily for 3 days

- 0.5mg twice daily for the next 4 days

- 1mg twice daily starting day 8 all the way to the 12 weeks

There are no significant clinical side effect noted but post –marketing cases of depression, suicidal ideations and myocardial infarction have been noted.. It is not recommended for pregnant and lactating mothers.

Bupropion

Bupropion is a prescription extended-release medication that reduces symptoms of nicotine withdrawal. It acts on chemicals in the brain that are related to nicotine craving, but it does not contain nicotine. It approximately doubles the likelihood of successfully quitting smoking compared to using no quit medication. Treatment with bupropion begins while the user is still smoking, one week prior to the quit date. Treatment is then continued for 7 to 12 weeks. Length of treatment should be based on the relative benefits and risks for each individual, and should be discussed with a physician. Dose tapering is not required when discontinuing treatment. The advantage of bupropion is that users begin taking the medication prior to quitting smoking, therefore preparing the body to deal with the stress of quitting. Some patients may lose their desire to smoke prior to their quit date or reduce the amount they smoke. It is effective for both genders and has been shown to aide cessation in depressed patients. Bupropion is generally well tolerated in persons with cardiovascular disease.

Dosage

- Dosing should begin at 150 mg/day, given every morning for the first 3 days, followed by a dose increase for most people to the recommended dose of 300 mg/day.
- The maximum recommended dose is 300 mg/day, given as 150 mg twice daily. Some persons do well on 150 mg once a day and have fewer side effects.
- An interval of at least 8 hours between successive doses is advised.
- The quit attempt should occur during second week of treatment

Nicotine replacement therapy

Nicotine replacement therapy is the remedial administration of nicotine to the body by means other than tobacco, usually as part of smoking cessation. The primary benefit of nicotine replacement therapy is that it prevents cravings in a smoker whilst allowing him to abstain from tobacco—and thus avoid the harmful effects of smoking.

7.1.9 Smoking Interventions in Special Groups

Pregnant and lactating women

Pregnant smokers and children exposed to secondhand smoke experience numerous health risks. For example, pregnant smokers have more miscarriages and stillbirths, and their babies experience a higher rate of sudden infant death syndrome. Infants born to smokers are at higher risk for brain damage, low birth weight, and respiratory disorders. Children exposed to secondhand smoke are more likely to suffer from health problems, including pneumonia, bronchitis, ear infections, and asthma.

Healthcare providers and other persons that see pregnant women are in a better position to offer smoking cessation or reduction interventions while offering suggestions in making positive changes to nutrition, breastfeeding, exercise and other important issues and therefore could also offer support in reducing smoking or quitting. These primary healthcare givers can also offer or refer the women to more intensive and ongoing counseling and provide them with appropriate and helpful resources. The interventions should be tailored to the specific needs of the woman and address the effects of tobacco use during pregnancy.

If behavioral interventions fail, NRT should be attempted. The 5As is also recommended for pregnant smokers and can be enhanced by providing referrals to pregnancy-specific programs or self-help materials. Women should be encouraged to remain smoke-free after delivery.

Younger smokers

It is estimated that 50% of adolescents who start smoking become regular smokers. The prevalence of tobacco use is now higher among teenagers and young adults than among other adult populations. However, the prevalence of quitting (i.e., the percentage of those who have ever smoked who are now former smokers) is also lower among these younger age groups. Studies indicate that most teenaged and young adult smokers want to quit and try to do so, but few succeed.

Interventions for the youth:

1. Clinicians should screen pediatric and adolescent patients and their parents for tobacco use and provide a strong message regarding the importance of totally abstaining from tobacco use.

2. Counseling and behavioral interventions shown to be effective with adults should be considered for use with children and adolescents. The content of these interventions should be modified to be developmentally appropriate.

3. When treating adolescents, clinicians may consider prescriptions for bupropion sustained release or nicotine replacement therapy when there is evidence of nicotine dependence and desire to quit tobacco use.

4. Clinicians in a pediatric setting should offer tobacco use cessation advice and interventions to parents to limit children's exposure to secondhand smoke.

Other interventions include:

Other interventions that can be used to help young smokers are cognitive behavioral interventions which include changing the young smokers' thoughts and beliefs around tobacco use, individual and group behavioral counseling interventions and use of quit lines.

Passive smokers/ second hand smoke

Second-hand smoke causes 600 000 premature deaths per year. There are more than 4000 chemicals in tobacco smoke, of which at least 250 are known to be harmful and more than 50 are known to cause cancer.

Exposure to secondhand smoke causes premature death and disease in children and adults who do not smoke. There is clear evidence of the harms of exposure to environmental tobacco smoke in pregnancy, to children (higher rates of respiratory and middle ear infections, meningococcal infections and asthma) and adults (increased risk of lung cancer and coronary heart disease).

Relapse prevention

Relapse prevention strategies aim to assist people to avoid or cope with high-risk smoking situations. Such strategies also aim to prevent a lapse from occurring or if it occurs from becoming a full relapse to smoking.

Suggested strategies including: Identifying high-risk smoking situations and important smoking triggers, planning coping strategies in advance, considering lifestyle changes that may reduce the number of high-risk situations encountered, e.g. stress management, reduction in alcohol consumption, encouraging patients to have a plan for how to deal with a slip to prevent it becoming a full relapse.

The risk of relapse is highest in the first week after a quit attempt. Seventy-five percent of relapses occur in the first six months. Even after being abstinent for a year, about one-thirds of ex-smokers may relapse. After two years the probability of relapse decreases to about 4%.

7.2 Alcohol and Substance Use

Alcohol is a psychoactive substance with dependence-producing properties that has been widely used in many cultures for centuries. The harmful use of alcohol causes a large disease, social and economic burden in societies. Harmful use of alcohol remains leading risk factors for morbidity, disability and mortality. Scientific evidence indicated alcohol being a component cause of more than 200 disease and injury conditions.

7.2.1 Health Risks of Alcohol Use

Understanding the overall beneficial effects of low-risk patterns of drinking; heavy drinking has detrimental health hazards. As mentioned above over 200 types of diseases have a scientifically proven cause effect relationship with alcohol consumption.

The major disease and injury categories attributable to alcohol consumption include, but are not limited to:

- Neuropsychiatric disorders (alcohol use disorders (AUD)): withdrawal induced seizure, depression, anxiety also epilepsy

- Cardiovascular diseases: ischemic heart diseases, ischemic stroke, hypertension, atrial fibrillation, hemorrhagic stroke all significantly impacted by alcohol consumption
- Gastrointestinal diseases: liver cirrhosis, pancreatitis
- Cancers: cancer of the mouth, nasopharynx, other pharynx and oropharnx, laryngeal cancer, esophageal cancer, colon and rectum cancer, liver cancer, female breast cancer and also pancreatic cancer are believed to be associated with alcohol consumption
- Intentional injuries: suicide and violence
- Unintentional injuries: almost all kinds of unintentional injuries impacted by alcohol consumption
- Alcohol fetal syndrome (AFS)
- Diabetes: dual effect low-risk drinking is preventive but high-risk drinking pattern is detrimental of diabetes.
- Infectious diseases: Pneumonia, tuberculosis
- Strong association exists between alcohol consumption and sexually transmitted diseases including HIV

7.2.2 Terminologies and Definitions

Harmful use of alcohol: is defined as a pattern of alcohol use that is causing damage to health. The damage may be physical (as in cases of liver cirrhosis) or mental (as in cases of depressive episodes secondary to heavy consumption of alcohol) (see ICD-10; WHO, 1992).

Alcohol dependence: Also known as alcoholism or alcohol dependence syndrome is defined as a cluster of behavioral, cognitive, and physiological phenomena that develop after repeated alcohol use and that typically include a strong desire to consume alcohol, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to alcohol use than to other activities and obligations, increased tolerance, and sometimes a physiological withdrawal state (see ICD-10; WHO, 1992).

Unrecorded alcohol: refers to alcohol that is not taxed in the country where it is consumed because it is usually produced, distributed and sold outside the formal channels under government control. Unrecorded alcohol consumption in a country includes consumption of home-made or informally produced alcohol (legal or illegal), smuggled alcohol, alcohol intended for industrial or medical uses, and alcohol obtained through cross-border shopping (which is recorded in a different jurisdiction). Sometimes these alcoholic beverages are traditional drinks that are produced and consumed in the community or in homes. Home-made or informally produced alcoholic beverages are mostly fermented products made from sorghum, millet, maize, rice, wheat or fruits.

Heavy episodic drinking (HED): is defined as consumption of 60 or more grams of pure alcohol (6+ standard drinks in most countries) on at least one single occasion at least monthly. The volume of alcohol consumed on a single occasion is important for many acute consequences of drinking such as alcohol poisoning, injury and violence, and is also important wherever intoxication is socially disapproved of. HED is associated with detrimental consequences even if the average level of alcohol consumption of the person concerned is relatively low.

Standard Drink: Standard drinks measures the amount of alcohol, not the amount of liquid in any of the alcoholic beverages – because it's the alcohol content that's most detrimental. Because drinks have different amounts of alcohol in them, the number of standard drinks in each bottle, can or container will be different. For different types of beer, wine, or malt liquor, the alcohol content can vary greatly. The standard drinks measure is a simple way to calculate how much pure alcohol contains an alcoholic beverage.

Units of alcohol in a drink can be calculated using the formula:

Unit of alcohol = vol (in ml) X % alcohol/ 1000

Example: 1 bottle of 4.5% alc beer has 330X4.5/1000 = 1.5 units

Local alcoholic beverages: Tella has about 4%, Tej has about 10% and arake has 40-45% alcohol content.

Remember to calculate average alcohol consumption per occasion or weekly in units.

7.2.3 Prevention of Alcohol Use through Policy Intervention

Appropriate alcohol policies and their effective reinforcement significantly contributed to reducing harmful use of alcohol in different countries, and the alcohol-attributable health and social burden in a population and in society. WHO indicated national alcohol policies shall outline comprehensive policy responses covering areas such as availability, marketing, pricing, drink–driving, prevention interventions and treatment in health-care systems.

Successful implementation of such policies requires strong leadership, political commitment, inter-sectoral action and sustained social awareness within the general population.

7.2.4 Creating Public Awareness and Community Action

Awareness raising activities about alcohol play a paramount role in the prevention of alcohol-related harms. Individuals and communities shall have access to sustained and consistent messages on the harms of alcohol use as well in the new and existing policies (drink driving etc…) and regulations on alcoholic beverages.

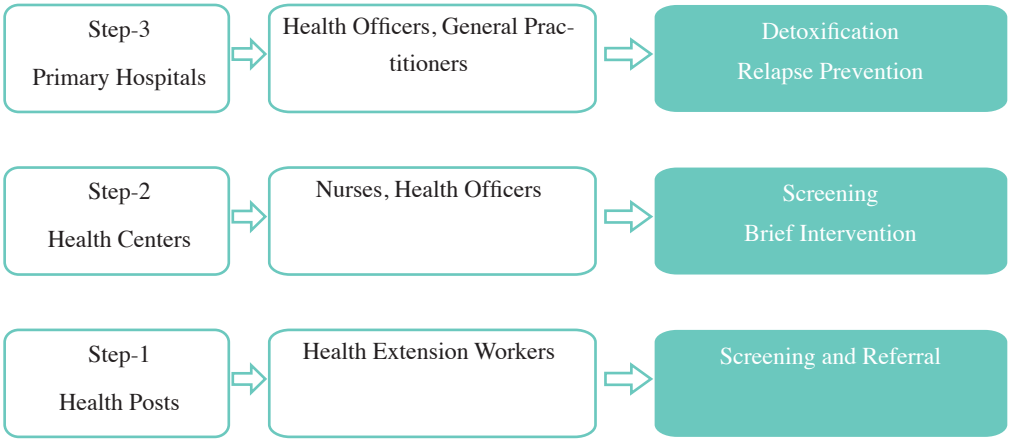
Community participation as seen in other programs and health interventions also reported an effective tool in the prevention of harmful alcohol use. Supported and empowered communities can use their local knowledge and cultural experiences and values to change behaviors.

7.2.5 Health Sector Response: Screening and Intervention for Alcohol

Screening, Brief Intervention, and Referral to Treatment (SBIRT) is an important intervention in primary care used to detect, reduce, and prevent problematic alcohol use and other drugs.

SBIRT can be easily used in primary care settings and enables healthcare professionals to systematically screen and assist people who may not be seeking help for a substance use problem, but whose drinking or drug use may cause or complicate their ability to successfully handle health, work, or family issues. SBIRT aims to prevent the unhealthy consequences of alcohol and drug use among those whose use may not have reached the diagnostic level of a substance use disorder, and to help those with the disease of addiction enter and stay with treatment.

FIG 7.2 Interventions for alcohol use at primary healthcare level



SBIRT: Core Components

1. Screening

Screening is a quick, simple method of identifying patients who use substances at at-risk or hazardous levels and who may already have substance use-related disorders. The screening instrument provides specific information and feedback to the patient related to his or her substance use. The typical screening process involves the use of a brief 1-3 question screen such as the National Institute on Alcohol Abuse and Alcoholism (NIAAA)'s single question screen. If a person screens positive on one of these instruments, s/he is then given a longer alcohol or drug use evaluation, using a standardized risk assessment tool such as AUDIT. The screening and risk assessment instruments are easily administered and provide patient-reported information about substance use that any healthcare professional can easily score.

Healthcare professionals should routinely carry out alcohol screening as an integral part of practice.

For instance, discussions should take place during new patient registrations, when screening for other conditions and when managing chronic disease or carrying out a medicine review. These discussions should also take place when promoting sexual health, when seeing someone for an antenatal appointment and when treating minor injuries.

Screening for Harmful Alcohol Use

Ask: all adults coming to your clinic about alcohol use using the question 'Do you drink alcohol containing beverages?' If the answer to this question is yes, proceed to the next screening question.

1. Screening: NIAAA Single Screen Question for Alcohol

   Q: How many times in the past year have you had X or more drinks in a day? (X= 5 or more for men and 4 or more for women)

2. For clients who screen positive for the Single Screen Question, use WHO Alcohol Use Disorders Identification Test (AUDIT) (see figure 7.3)

2. Brief Intervention

Brief Intervention is a time-limited, patient-centered strategy that focuses on changing a patient's behavior by increasing insight and awareness regarding substance use. Depending on severity of use and risk for adverse consequences, a 5-10 minute discussion or a longer 20-30 minute discussion provides the patient with personalized feedback showing concern over alcohol and/or drug use. The topics discussed can include how substances can interact with medications, cause or exacerbate health problems, and/or interfere with personal responsibilities.

Brief intervention is designed to motivate patients to change their behavior and prevent the progression of substance use. FRAMES is the acronym for brief intervention.

- Feedback: Given information about their substance use based on their risk assessment scores.
- Responsibility: Patients take personal responsibility to change their behavior.
- Advice: Patients are advised in clear, respectful terms to decrease or abstain from substance use;encouraged to set goals to decrease substance use and to identify specific steps to reach those goals.
- Menu of options are discussed with patient to achieve desired goal.
- Empathic understanding of the patient's situation is necessary.
- Self-efficacy: Patients are encouraged to build on existing strengths to achieve desired goals.

FIG 7.3 AUDIT interview

The Alcohol Use Disorders Identification Test (AUDIT) Interview Version

Begin the AUDIT by saying ''Now I am going to ask you some questions about your use of alcoholic beverages during this past year''

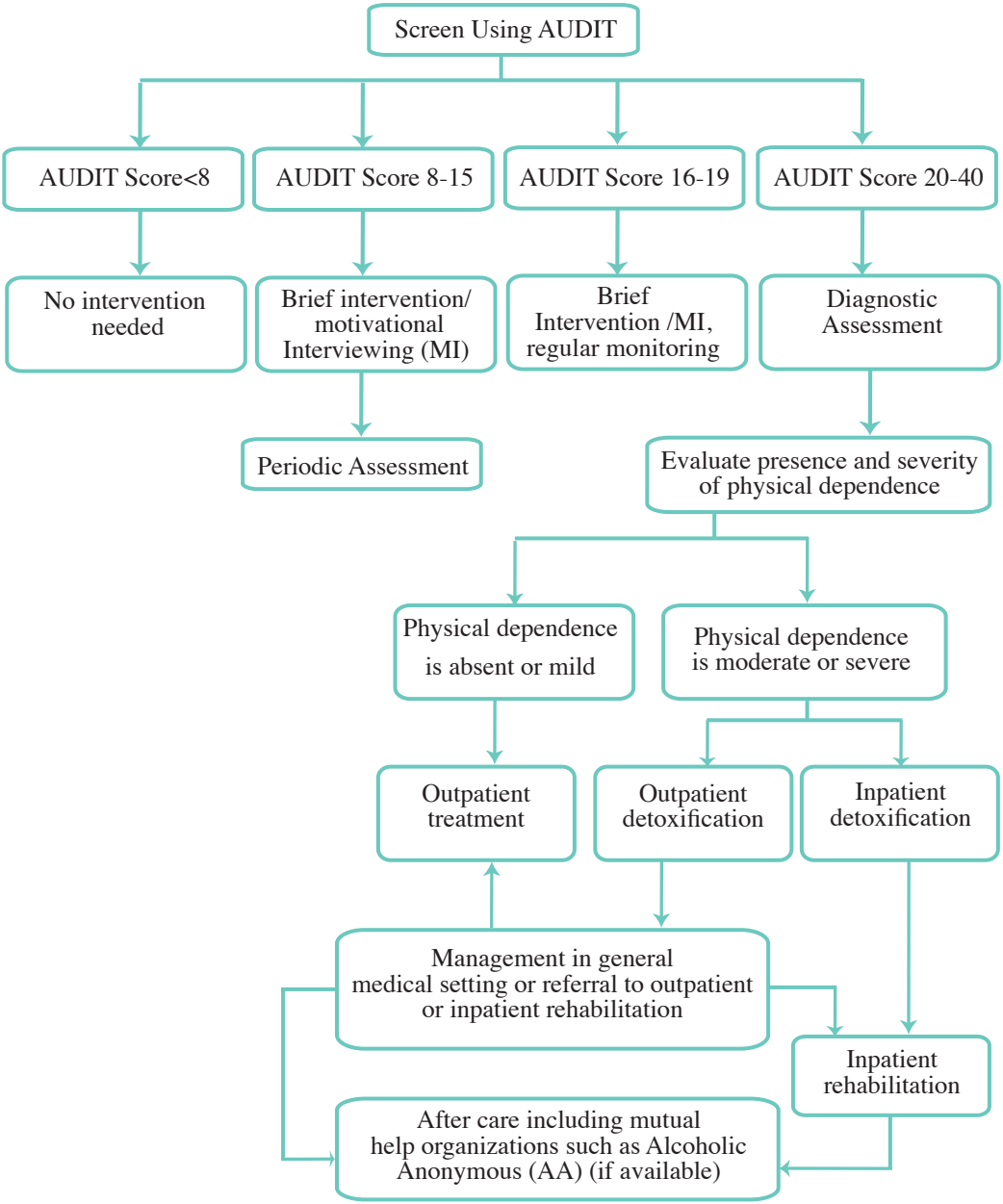
Explain what is meant by ' ' alcoholic beverages ' ' by using local examples of beer, ''tella'' 'teje' 'areke' etc.

Code answers in terms of ' standard drinks ' Place the correct answer number in the box at the right.

1. How often do you have a drink containing alcohol?		6. How often during the last year have you needed a first drink in the morning to get yourself going after heavy drinking session?	
(0) Never [Skip to Qs 9-10]	(3) 2 to 3 times a week	(0) Never	(3) Weekly
(1) Monthly or less	(4) 4 or more times a week	(1) Less than monthly	(4) Daily or almost daily
(2) 2 to 4 times a month	☐	(2) Monthly	☐
2. How many drinks containing alcohol do you have on a typical day when you are drinking?		7. How often during the last year have you had a feeling of guilt or remorse after drinking?	
(0) 1 or 2	(3) 7, 8, or 9	(0) Never	(3) Weekly
(1) 3 or 4	(4) 10 or more	(1) Less than monthly	(4) Daily or almost daily
(2) 5 or 6	☐	(2) Monthly	☐
3. How often do you have six or more drinks on one occasion?		8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?	
(0) Never	(3) Weekly	(0) Never	(3) Weekly
(1) Less than monthly	(4) Daily or almost daily	(1) Less than monthly	(4) Daily or almost daily
(2) Monthly	☐	(2) Monthly	☐
4. How often during the last year have you found that you were not able to stop drinking once you had started?		9. Have you or someone else been injured as a result of your drinking?	
(0) Never	(3) Weekly	(0) No	
(1) Less than monthly	(4) Daily or almost daily	(1) Yes but not in the last year	
(2) Monthly	☐	(2) Yes, during the last year	☐
5. How often during the last year have you failed to do what was normally expected from you because of drinking?		10. Has a relative or friend or a doctor or anther health worker been concerned about your drinking or suggested you cut down?	
(0) Never	(3) Weekly	(0) No	
(1) Less than monthly	(4) Daily or almost daily	(1) Yes but not in the last year	
(2) Monthly	☐	(2) Yes, during the last year	☐
Record total of specific items here			☐

If total is greater than recommended cut-off, consult User's Manual

FIG 7.4: Algorithm Summarizing Audit Score with Corresponding Intervention



Brief interventions are typically provided to patients with less severe alcohol or substance use problems who do not need a referral to additional treatment and services. In addition to behavioral health professionals, medical personnel (e.g., doctors, nurses, HOs) can conduct these interventions and need only minimal training. In the case of patients with addictions, more intensive interventions may be needed. Much of the discussion in intensive intervention is similar to that of the brief intervention; however, the intensive sessions tend to be longer (20-30 minute) and can include multiple sessions, a referral to a mental health specialist, and the addition of a specific pharmacological therapy. While medical personnel who have received additional training may conduct intensive interventions, mental health professionals often conduct these longer counseling sessions.

3, Management of Alcohol Use/Induced Disorders

NB: The following management guidelines were adapted from the 'mhGAP Intervention Guide for mental, neurological and substance use disorders in non-specialized health settings, WHO, 2010'

Emergency conditions related with alcohol

A. Alcohol Intoxication

Is the person acutely intoxicated?

Look for

- Smell of alcohol on the breath
- Slurred speech
- Uninhibited behavior

Assess

- Level of consciousness
- Cognition and perception

Management of alcohol intoxication: if the person has signs of severe intoxication:

- Assess airway and breathing.

- Put the person on their side to prevent aspiration.
- Observe until the effect of alcohol is worn off.
- Refer to hospital if necessary.

B, Alcohol Withdrawal

Does the person have features of alcohol withdrawal?

Alcohol withdrawal occurs following cessation of heavy alcohol consumption, typically between 6 hours and 6 days after the last drink.

Look for:

- Tremor in hands
- Sweating
- Vomiting
- Increased pulse and blood pressure
- Agitation

Ask about:

- Headache
- Nausea
- Anxiety

Is withdrawal likely to be SEVERE?

➢ **Look for:**

- Past episodes of severe alcohol withdrawal, including delirium and seizures
- Other medical or psychiatric problems or benzodiazepine dependence
- Severe withdrawal symptoms already present only a few hours after stopping drinking

If the above criteria are met, treat **immediately** with diazepam.

Management of alcohol withdrawal

- Be alert for the person at risk of a withdrawal syndrome, for example, the person with undiagnosed alcohol dependence in the district hospital.
- When there is evidence of a withdrawal syndrome developing (or before withdrawal symptoms develop in the case of planned withdrawal), administer diazepam at an initial dose of up to 40 mg daily (i.e., 10 mg four times daily or 20 mg twice daily) for 3 – 7 days. In people with impaired hepatic metabolism (e.g. liver failure, elderly) use a single low dose initially (5 – 10 mg) and determine the duration of action of this dose before prescribing further doses.
- Administer thiamine 100 mg / day orally for 5 days (or longer if required) to prevent the development of thiamine-deficiency syndromes such as Wernicke's encephalopathy. Consider other vitamin supplementation when indicated.
- Administer 40% dextrose to treat hypoglycemia.
- Ensure adequate fluid intake and electrolyte requirements are met. Correct potassium and magnesium levels that are typically low.
- Provide as quiet and non-stimulating an environment as possible, which is well lit in the day time and lit enough at night to prevent falls if the person gets up in the night.
- If the person has severe alcohol dependence (previous history of severe alcohol withdrawal, seizures or delirium) or concurrent serious medical or psychiatric disorders or is lacking adequate support, CONSULT A SPECIALIST, if available or refer him to specialist mental healthcare center.

WHERE to withdraw from alcohol?

- ✓ Have there been past episodes of severe withdrawal symptoms, seizures or delirium?
- ✓ Are there other significant medical or psychiatric problems?
- ✓ Do significant withdrawal features develop within 6 hours of the last drink?

- ✓ Has outpatient withdrawal failed?
- ✓ Is the person homeless or without any social support?

If YES to any of the above then inpatient withdrawal is preferable.

C. Alcohol-withdrawal delirium

- ✓ Treat the person in a low stimulus and safe environment where they are unlikely to do themselves harm.
- ✓ Treat underlying alcohol withdrawal with diazepam.
- ✓ Administer thiamine 100 mg i.v. or i.m. 3 times daily for 5 days.
- ✓ Use antipsychotic medication, if necessary, for the duration of psychotic symptoms only (e.g. haloperidol 2.5 – 5 mg orally tid).
- ✓ Maintain hydration.
- ✓ Avoid restraining the person. Always consider other causes of delirium and hallucinations (e.g. head injury, hypoglycaemia, infection (most commonly pneumonia), hypoxia, hepatic encephalopathy or cerebrovascular accidents).
- ✓ Treat in hospital or detoxification centre, if available.

D. If withdrawal is complicated by a seizure, treat with diazepam in the first instance and do not use anticonvulsants such as phenobarbitone or phenytoin to prevent further seizures because the seizure is not epileptic seizure which needs long-term treatment. The seizure will disappear when the withdrawal state improves.

E. Does the person have acute confusion or clouding of consciousness with recent history of heavy alcohol consumption?

Is this acute Wernicke's encephalopathy, head injury or alcohol-withdrawal delirium?

- Examine for nystagmus and ataxia of Wernicke's encephalopathy. Ophthalmoplegia (paralysis of eye muscles) may occur in severe cases of this disorder.

- Examine for signs of head injury such as lacerations, or bleeding around head or ears.
- Re-assess for alcohol withdrawal delirium

Management:

Acute Wernicke's encephalopathy

- ✓ Treat all suspected cases with i.v. or i.m. thiamine 100 mg 3 times daily for 3 – 5 days.
- ✓ Refer the person urgently to the hospital.

Head injury

- ✓ Monitor level of consciousness.
- ✓ Seek surgical opinion-refer to the hospital.

Alcohol withdrawal delirium

- ✓ Treat alcohol withdrawal delirium.

Management of Harmful Alcohol Use

Ask if the person consumes alcohol in a way that puts them at risk of harm:

Drinking quantity and frequency:

- ✓ Has consumed 5 or more standard drinks (or 60 g alcohol) on any given occasion in the last 12 months.
- ✓ Drinks on average more than two drinks per day.
- ✓ Drinks every day of the week.

State clearly the results of alcohol use assessment and explain the links between this level of alcohol use, the person's health problems, and the short-term and long-term risks of continuing use at the current level.

4, Referral to Specialist Care

In some cases, a more advanced treatment option is necessary and the patient is referred to a higher level of care. This care is often provided at specialized ad-

diction treatment programs. The referral to treatment process consists of helping patients access specialized treatment, selecting treatment facilities, and facilitating the navigation of any barriers such as cost of treatment or lack of transportation that would hinder them from receiving treatment in a specialty setting. In order for this process to occur smoothly, primary care providers must initially establish and cultivate relationships with specialty providers, and then share pertinent patient information with the referral provider. Handling the referral process properly and ensuring that the patient receives the necessary care coordination and follow-up support services is critical to the treatment process and to facilitating and maintaining recovery.

Criteria for referral:

1. An AUDIT score of ≥20 with evidence of severe alcohol dependence, e.g. those at risk of withdrawal seizure or delirium tremens, that may not be managed at primary care, for instance if patients need inpatient detoxification and if such service is not available in the primary care facility.

2. Physical complications of alcohol dependence such as cirrhosis require referral to joint medical and mental health specialist to address the medical as well as psychiatric aspects of the problem.

7.3 Khat Use Related Disorders

Intoxication with too much khat was reported to cause transient psychotic phenomena. Confusion, disorientation, grandiose fantasies and a mildly depressed mood may occur. Some people who chew khat on daily basis may develop psychological dependence to the chemical in khat. In 1973, the World Health Organization Expert Committee on Drug Dependence included khat type preparations of Catha edulis Forsk (scientific name for the khat plant), in their group of 'dependence-producing drugs'. People who chew khat for a long time may develop a state of a motivational syndrome locally termed gezba. They usually start chewing khat in the morning called yejebena (eye opener) which indicates dependence on khat. They also report some frightening nightmares when they suddenly stop chewing khat known as dukak.

The above phenomena are seen in people who use amphetamines. Since there are

no specific diagnostic criteria developed for khat, we use the amphetamine criteria because khat is considered a 'natural amphetamine'.

The main psychoactive chemical in khat, Cathinone, acts like amphetamine though it is half as potent as amphetamine. It is a stimulant, the effects being euphoria, an increased alertness, increased attention and concentration, anxiety, insomnia and lack of appetite. Heavy khat abuse may result in manic-like episodes, paranoia and schizophrenic-like psychoses, which usually resolve within weeks of stopping the abuse. These features are seen in amphetamine intoxication.

Habitual use of khat results in withdrawal symptoms that are often reported by the chewer as fatigue, insomnia or sleepiness, and slowness of mind and body. The most striking withdrawal symptom in khat is the presence of frightening dream with dramatic paranoid features. The person finds himself in a situation of intense and horrible suffering. This phenomenon is known by the name dukak. It is described in the DSM-IV stimulant (amphetamine) withdrawal criteria as 'vivid, unpleasant dreams'.

7.3.1 Adverse consequences of khat on physical health and social wellbeing

Recent literature reviews on health consequences show that khat causes harm to the body such as teeth and gum damage, ulcer of throat and stomach, hemorrhoids, cardiovascular diseases, sexual dysfunctions (example impotence in men), low birth weight babies in mothers who chew khat during pregnancy. The chemicals in khat known by the name tannins are responsible for the adverse consequences on gastrointestinal system.

The habit of chewing khat has many adverse social consequences. Individuals commonly divert their income into khat chewing, neglecting their families' needs. The average family income can sometimes be halved to support the habit. Khat has furthermore been implicated as a causal factor for family instability, divorce and other criminal behavior. The cultivation of khat resulted in decreased production of other more essential crops like cereals leading to malnutrition and disease.

7.3.2 Screening, intervention, referral and treatment for Khat abuse

A. **Screening for Khat Use**

Q: Do you chew Khat?

If the answer to this question is yes, screen for severity of dependence.

Screening for Severity of Khat Dependence

The following questionnaire was found to be valuable for testing how severe khat dependence is in an individual. It measures severity of psychological dependence on khat which is the common form of dependence. Remember that alcohol causes both psychological and physiological dependence whereas khat only causes psychological dependence. Ask the client each of the questions and score according to severity.

If a person scores a total of ≥ 6, then he is most probably dependent on khat and needs intervention.

1. Did you ever think that your khat chewing was out of control?

0. Never or almost never 1. Sometimes 2.Often 3. Always or nearly always

2. Did the prospect of not chewing any khat make you anxious or worried?

0. Never or almost never 1. Sometimes 2.Often 3. Always or nearly always

3. Did you worry about your khat chewing?

0. Never oralmost never 1. Sometimes 2.Often 3. Always or nearly always

4. Did you wish you could stop chewing khat?

0. Never or almost never 1. Sometimes 2.Often 3. Always or nearly always

5. How difficult would you find it to stop or go without khat chewing?

0. Not difficult 1. Quite difficult 2.Very difficult 3. Impossible

B. **Management of Khat-related Disorders**

Management of khat intoxication and withdrawal

Generally speaking, khat doesn't produce physical dependence. It only produces psychological dependence.

1. Khat intoxication

- ✓ Generally severe intoxication that warrants clinical attention is rare. If it occurs it is usually similar with amphetamine intoxication and patient may present with psychosis with paranoid features.
- ✓ Treat with diazepam 10 mg po if the person experiences severe anxiety. Use diazepam sparingly because of the risk of dependence.
- ✓ Antipsychotics e.g. Haloperidol 2 mg or Chlorpromazine 50-100mg po can be given if the person has psychotic symptoms such as persecutory delusion.

2. Khat withdrawal

- ✓ Symptoms of khat withdrawal are generally mild and the person can get over them without any medication in few days.
- ✓ If the person experiences sleep disturbance or severe frightening nightmares, diazepam 10 mg po noct can be given for few days.

3. Khat dependence

- ✓ There are few reports of khat dependence, mainly psychological.
- ✓ There is no specific treatment protocol developed for khat dependence.
- ✓ Since the dependence is generally mild, medication may not be necessary.

C. Counseling is needed to encourage abstinence and manage craving. Use FRAMES model of brief intervention mentioned above for alcohol.

D. **Referral Criteria to Specialist Mental Health Service**

During the counseling process, if you detect the following problems, occurring within the past 12 months of evaluation time, you need to consider referral to a mental health specialist including psychiatric nurses. Khat chewers who score greater than or equal to 6 on the SDS-Khat score and when attempt to counsel them failed.

7.4 Unhealthy Diet and Physical Inactivity

7.4.1 Introduction

Individuals' health is not at random. The interaction at societal, cultural and economic level as well as individuals' own behavior influences the health outcomes of the person involved. The diets people eat define their health status, while behaviors like physical activity and tobacco use modify the health outcome to the better or worse. Scientific evidences suggest adequate consumption of fruits and vegetables reduces the risk for cardiovascular diseases, stomach and colorectal cancers. On the other hand, high consumption of saturated fats and trans-fatty acids is linked to heart disease.

Increasing urbanization and rapid economic development resulted in changes in dietary habit and level of physical activity; unfortunately not all of these changes have positive effects on health status of individuals. Due to increased urbanizations, consumptions of factory processed foods such as saturated fats, trans-fatty acids, products of animal protein, sugars and other energy dense foods has increased while level of physical activity on the contrary is slowing down. It is clear that the combination between consumption of high energy dense food and low level of physical activity raised the risk of overweight and obesity. While an increase in body mass index (BMI) is well known to increase the risk of heart disease, stroke, diabetes and certain type of cancers.

Taking into account the rising burden of NCDs, strategies must be adopted to ensure and promote healthy diets, physical activity and adoption of healthier lifestyle so as to effectively manage and prevent overweight and obesity by extension of the NCDs. Promoting healthy diets, physical activity and lifestyles to reduce

the burden of NCDs requires a multi-sectoral approach involving the various relevant sectors in the country.

7.4.2 Promotion through Policy and Legislations

Individuals' lifestyle choices, unhealthy diets and low level of physical activity and subsequently the undesired outcomes of overweight and obesity cause a range of NCDs and are considered emerging concerns of public health in Ethiopia. Therefore, we will design and implement mechanisms and strategies that aim to encourage consumption of healthy and traditionally acceptable foods and discourage the reverse. Healthier foods must be physically available and financially affordable while public health measures that discourage the production, import, distribution and consumption of unhealthy foods and dietary habits should come to action.

Creation of an enabling environment for physical activity that motivates individuals and the community to participate in physical activity must get priorities and concerned stakeholders shall strongly work towards its realization. Additionally, it is our belief that traditionally acceptable and scientifically proven policy and effective reinforcement of these policies and legislations will significantly reduce diseases and death related to unhealthy diet and physical inactivity.

Policy and legislation considerations in Ethiopia:

- Policies that promote local production, distribution and consumption of vegetables, fruits and cereals while restrictive and discouraging policies on import, production, distribution and consumption of high energy dense foods should be drawn.
- Taxation subsidies on vegetables and fruits while increasing taxations on processed foods and drinks to decrease consumption of excess salt, sweeteners, saturated fats or trans fatty acids and/or refined carbohydrates.
- Packaging and labeling of factory processed foods and drinks, including detailed nutritional content.
- Regulation of promotion and advertisement of processed foods and drinks.

- Policies to promote physical activity in urban areas, including sidewalks, mass sport centers, residential areas, recreational parks, cycling, etc.
- Promotion of physical activity through activities of daily living including in schools, and workplaces.
- Policies promoting traditional sports with vigorous and moderate physical activities.

7.4.3 Promotion through public awareness

A well-informed community makes informed choice. And when we say individuals and communities are responsible for producing their own health and participating in the process, nothing will be as practical as it would be in the role of developing and adopting a choice of healthy lifestyle through approval of a choice of their healthy dietary habits and physical activity. In order to bring about this intended behavior, individuals and communities must have access to information, education and communication that promote healthy dietary habits and physical activity; while, information and promotional messages that might cause wrong perception must be discouraged and restricted.

Similar strategies, technologies and media used for education, communication and public awareness of tobacco control can be used for promotion of healthy diet and physical activity.

7.4.4 Prevention & management of overweight and obesity

Overweight/obesity is a complex, multi-factorial health problem that develops from the interaction between genotype and the environment. Our understanding of how and why obesity occurs is incomplete; however, it involves the interaction of social, behavioral, cultural, physiological, metabolic, and genetic factors.

Management of overweight and obesity status is a two-step process: assessment and treatment.

- **Assessment:** requires determination of the degree of obesity and the absolute risk status.
- **Treatment:** includes the reduction of excess weight and maintenance of

body weight, as well as the institution of additional measures to prevent and control any associated risk factors.

Anthropometric measurements

Categories (see table 7.4)

- Underweight BMI <18.5 Kg/M2
- Normal weight 18.5 Kg/M2 ≤ BMI <25Kg/M2
- Overweight 25 Kg/M2 ≤ BMI ≤30 Kg/M2 increased risk
- Obese BMI > 30 Kg/M2 substantially increased risk
- Waist circumference should be recorded and client placed in one of the three risk categories below:
  - ✓ Waist circumference <94 cm (M); <80 cm (W) Acceptable range
  - ✓ Waist circumference >94 cm (M); >80 cm (W) Increased risk
  - ✓ Waist circumference >102 cm (M); >88 cm (W) Substantially increased risk

N.B M stands for men; while, W stands for women

- Waist-to-hip ratio (WHR) should be calculated for each participant and client should be categorized using the cut-off below:
  - ✓ Waist–hip ratio ≥0.90 (M); ≥0.85 (W) substantially increased risk

N.B Waist circumference is a better predictor of cardiovascular diseases and type II diabetes compared to BMI and Waist to Hip ratio.

A. Dietary Counseling

In the majority of overweight and obese patients, adjustment of the diet will be required to reduce caloric intake. Dietary therapy includes instructing patients in the modification of their diets to achieve a decrease in caloric intake. To achieve this nutritional status screening will be the first step.

Screening for Nutritional status

- Take the weight and height of your client
- Calculate BMI
- If underweight(<18.5kg/m2), advise/counsel the patient/client to take nutritious foods
- If Normal weight(18.5-24.99kg/m2), praise and advise to maintain it
- If overweight/obese (>=25 kg/m2), counsel him/her and refer for bio-chemical tests as deemed important.

OR

1. Waist circumference (particularly to assess central obesity)

- Take the waist circumference
- If >80 cm for females and >94 cm for males counsel on preventive measures
- If <80 cm for females and <94 cm for males praise and advise to maintain it

2. Screening for dietary intake

- Do you take fruits and vegetables every day?(Yes, No)
- If No, advice/counsel (using show cards for fruits and vegetables)
- If Yes, How frequent do you take?
- Less than 5 servings/day (counsel/Advice)
- Five servings/day (equivalent to 400gm) (praise and advise to continue doing it)

Table 7.4: classification of overweight and obesity

Classification of Overweight and Obesity by BMI, Waist Circumference, and Associated Disease Risk*				
	Body Mass Index(kg/m^2)	Obesity Class	Disease risk (Relative to normal weight and waist circumference)	
			Men<102cm Women<88cm	Men>102cm Women>88cm
Underweight	<18.5			
Normal	18.5-24.9			
Overweight	25.0-29.9		Increased	high
Obesity	30.0-34.9	I	High	Very high
	35.0-39.9	II	Very high	Very high
Extreme Obesity	>40.0	III	Extremely high	Extremely high

Physical Activity

As it has already been addressed and recommended aerobic exercises improve cardio-respiratory and muscular fitness, bone health, reduce the risk of NCDs and depression. Physical activity should be an integral part of excess weight therapy and weight maintenance. Initially, moderate levels of physical activity for 30 to 45 minutes at a time and 3 to 5 days per week, should be encouraged. (OR) muscle-strengthening activities should be done involving major muscle groups on 2 or more days a week.

- Physical activity participation is measured by asking clients/patients to report on the amount of time they spend doing different types of physical activity during work, transport and leisure time.
- Vigorous activity is defined as more than 10 minutes at a time for activities like ploughing, sawing hardwood, or playing football.
- Moderate physical activity is defined as more than 10 minutes at a time for activities like gardening, washing clothes by hand, drawing water or cycling.

- Low physical activity which corresponds to the resting metabolic rate is defined as activities such as secretarial or office work, watching TV, playing cards, or weaving traditional mats.

- Physical activity is converted to MET-minutes for the purpose of measurement and comparability. The term MET is an abbreviation for metabolic equivalent and is used to reflect the intensity of the specific physical activity. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a caloric consumption of 1 kcal/kg/hour. It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when vigorously active.

- Moderate PA (work and leisure domain) = 4.0 METS

- Vigorous PA (work and leisure domain) = 8.0 METS

- Transport-related walking/cycling = 4.0 METS

- Inactive: <600 MET minutes/week

- Moderately active: 600-1500 MET minutes/week

- Highly active: ≥1500 MET minutes/week

B, Steps in screening and counseling for physical activity

Physical activity (For adults 18-64 years old)

- In the past one week, have you been engaged in any work-related/transportation/recreational physical activities that heavily or slightly increase your breathing rate?

- If No,-----Give advice (If not contraindicated) (Use show cards when advising/counselling)

- If yes, in total for how long did you engage?

- Assign the level of physical activity as (Low, Moderate or High)

- (Moderate activity for 150minutes; vigorous activity for 75 minutes)

- If moderate or high, advise to continue doing it.
- If low, counsel to start physical activity (start with moderate physical activity).
- If no, provide counseling on physical exercise and recommend biochemical tests as deemed necessary.

Physical activity (Children and teens):

- Get at least 1 hour of moderate intensity activity each day, with vigorous activity on at least 3 days each week.
- Advice should also be given to limit sedentary behavior such as sitting, lying down, watching TV, and other forms of screen-based entertainment.

Behavioral Therapy

Obesity is a chronic health problem, thus its management requires a lifelong effort. Behavioral therapy provides methods for overcoming barriers to compliance with dietary therapy and/or increased physical activity, and these methods are important components of overweight treatment.

Thus, health workers should target at changing patients attitude, belief and perceptions towards diet and physical activity!

7.5 Dyslipidemia

Both high levels of LDL and Low level of HDL are risk for heart disease and together referred to as dyslipidemia. Elevated cholesterol and triglyceride levels are together referred to as hyperlipidemia. Hypercholesterolemia is one of the major contributors to atherosclerosis and coronary heart disease. Low-density lipoprotein (LDL) cholesterol is the primary lipoprotein mediating atherosclerosis. The optimal LDL cholesterol level is <100 mg per dl (2.60 mmol per L), while the HDL shouldn't be less than 40mg per dl.

7.5.1 Screening for those at risk

Major risk factors that modify LDL goals

- *Age (men ≥ 45 years; women ≥ 55 years)*
- *Cigarette smoking*
- *Hypertension (blood pressure >140/90 mm Hg or taking antihypertensive medication)*
- *Family history of premature CHD (CHD in male first-degree relative <55 years)*
- *CHD in female first-degree relative <65 years)*
- *Low HDL cholesterol (<40 mg per dL [1.05 mmol per L])*
- *Once low-density lipoprotein cholesterol is at an accepted level, physicians are advised to address the metabolic syndrome and hypertriglyceridemia*

Major risk factor that modify LDL goals

- *Metabolic syndrome(see table below)*
- *Established Coronary Heart Disease*
- *High LDL level*
- *High TGL level*
- *Individuals using anabolic steroids also have low HDL*

7.5.2 Recommended goal for control of dyslipidemias

1-Low HDL level

The issue of whether pharmacologic intervention should be used to specifically raise HDL-C levels has not been adequately addressed in clinical trials.

- Smoking should be discontinued;
- Obese persons should be encouraged to lose weight;
- Sedentary persons should be encouraged to exercise;
- Diabetes should be optimally controlled;
- Medications associated with reduced plasma levels of HDL-C should be discontinued;
- Niacin is the most effective HDL-C–raising therapeutic agent. (Increase plasma HDL-C by up to 30%, although some patients fail, Statin and fibrins raise only <15%)

2-High LDL Cholesterol

- For patients with the metabolic syndrome and diabetes, LDL cholesterol should be reduced to <100 mg/dL and perhaps further in patients with a history of CVD events.
- For patients with the metabolic syndrome without diabetes, the Framingham risk score may predict a 10-year CVD risk that exceeds 20%. In these subjects, LDL cholesterol should also be reduced to <100 mg/dL.
- With a 10-year risk of <20%; however, the targeted LDL cholesterol goal is <130 mg/dL.
- Diets restricted in saturated fats (<7% of calories), trans-fats (as few as possible), and cholesterol (<200 mg daily) should be applied aggressively.
- If LDL cholesterol remains above these goals, pharmacologic intervention is needed.

3-Hypertriglyceridemia

- A fasting triglyceride value of <150 mg/dL is recommended.
- In general, the response of fasting triglycerides relates to the amount of weight reduction achieved. A weight reduction of >10% is necessary to

lower fasting triglycerides.

- A fibrate (Gemfibrozil or Fenofibrate) is the drug of choice to lower fasting triglycerides and typically achieve a 35–50% reduction.

- Concomitant administration with drugs metabolized by the 3A4 cytochrome P450 system (including some statins) greatly increases the risk of myopathy.(In such situations, Genofibrate may be preferable to Gemfibrozil)

N.B. ATP = Adult Treatment Panel; LDL = low-density lipoprotein; HDL = high-density lipoprotein; VLDL = very low-density lipoprotein.

*—There are two approaches to drug therapy: (1) intensified therapy with LDL-lowering drug or (2) nicotinic acid or fibrate can be added. Non-HDL = LDL + VLDL. The non-HDL goal is 30 mg per dl higher than the LDL goal.

†—the approach to triglyceride lowering is a diet very low in fat (15 per cent of calorie intake), weight reduction, increased physical activity and, usually, a triglyceride-lowering drug (fibrate or nicotinic acid).

7.5.3 Approach to Lipid-Modifying Therapy

The major goal of lipid-modifying therapy in most patients with disorders of lipid metabolism is to prevent Atherosclerotic CVD and its complications. Management of lipid disorders is based on clinical trial data demonstrating that treatment reduces cardiovascular morbidity and mortality, although reasonable extrapolation of these data to specific subgroups is sometimes difficult, albeit required. Clearly, elevated plasma levels of LDL-C are strongly associated with increased risk of Atherosclerotic CVD, and treatment to lower the levels of plasma LDL-C decreases the risk of clinical cardiovascular events in both secondary and primary prevention.

Abnormalities in the TG-HDL axis (elevated triglyceride, low HDL-C, or both) are commonly seen in patients with CHD or who are at high risk for developing it, but clinical trial data supporting the treatment of these abnormalities is much less compelling, and the pharmacologic tools for their management are more limited.

7.5.4 Management of dyslipidemias

I. Non-pharmacologic Treatment

A healthy life-style approach for all dislipidemic patients is generally recommended including:

1. Healthy diet

- Low in simple sugars
- Low in saturated fats (predominantly animal fats)
- Low in trans-fatty acids and hydrogenated oils
- Increased fruits and vegetable portions in regular meal plans
- Encourage high fiber containing diet

2. Weight Loss and Exercise

- Regular physical exercise 3-5 days per week, at least for 30 minutes per session;
- Regular exercise should be continued regardless of its effect on weight loss as there are multiple benefits in addition to weigh reduction.

II. Pharmacologic Treatment

The decision to use drug therapy depends on the level of cardiovascular risk. Four major groups of patients are identified to benefit from lipid lowering agents such as statin. In these groups the Atherosclerotic cardiovascular disease (ASCVD) risk reduction clearly outweighs the risk of adverse events.

1. Individuals with clinical ASCVD
2. Individuals with primary elevations of LDL–C ≥190 mg/dL
3. Individuals 40 to 75 years of age with diabetes, with LDL-C 70-189 mg/dL
4. Individuals without clinical ASCVD or diabetes who are 40 to 75 years of age with LDL-C 70- 189 mg/dL and an estimated 10-year ASCVD risk of 7.5% or higher

1. Statins

Are inhibitors of HMG-CoA reductase which is a key enzyme in cholesterol bio-synthesis, and is generally the first choice for drug therapy.

Potential side effects of Statins include:

- ✓ dyspepsia
- ✓ headaches
- ✓ fatigue
- ✓ Myalgia
- ✓ Severe myopathy and even rhabdomyolysis occur rarely with statin treatment (suspect if significant muscle pain or weakness develops)*
- ✓ Elevation in liver transaminases * (ALT) and (AST) –Get LFT at base line, 3 months after treatment is started and then annually. If ALT increases to > 3x upper normal limit, refer patient to a specialist.

* Patients with these side effects require referral to a specialist.

Intensity of statin treatment depends on the statin benefit group the patient belongs to.

Daily Dosage ranges for locally available statin:

- Atrovastatin 10-80mg/day
- Rosuvastatin 5-40mg/day
- Simvastatin 10-40 mg/day
- Lovastatin 20-40mg/d

III. Refer to the respective sections of lipid management in specific clinical

conditions (e.g. Diabetes Mellitus, Coronary heart diseases, Cerebro-vascular diseases)

Chapter 8: Program Implementation

8.1 Guidance for Program Managers

8.1.1 Guiding principles

The national NCDs program is based upon the following principles:

- Healthcare priorities and interventions should be guided by empirical evidence on the current and future burden of diseases and their impact on socioeconomic development, as well as on cost-effectiveness of interventions.
- Programs for the prevention and control of non-communicable diseases need to be organized as an integral part of primary healthcare, within the framework of the health sector transformation plan.
- Programs should integrate population-wide and high-risk individual approaches in a complementary manner (optimal mix), so as to reduce exposure to risk factors at the population level and reduce morbidity, mortality and disability among high risk individuals.
- In light of their cumulative effect, exposure to non-communicable disease risk factors should be prevented at all stages of life, with a focus on childhood, adolescence and youth (life-course perspective).
- Interventions for the prevention and control of non-communicable diseases have to be comprehensive; targeting populations within the community, institutions and at work places, so as to serve the needs of the entire population. Preventive health and primary healthcare for schools and workplace environments, as well as community based care for the elderly and disabled people have to constitute part of the program intervention for the prevention and control of non-communicable diseases.

- The national non-communicable diseases prevention and control program should provide a framework for collaboration of all relevant sectors with the shared goal of national socioeconomic development, including the private health sector, non-governmental organizations, and associations of patients or health professionals.
- Task shifting should be promoted in order to expand accessibility of services for non-communicable diseases prevention and control.
- Community involvement should be promoted in the planning and implementation of programs for prevention and control of non-communicable diseases.
- Cultural, traditional, or religious practices with positive contribution to chronic disease prevention and control should be preserved and promoted.

8.1.2 Planning and Implementation of National NCDs Prevention and Control Program

Planning and implementation will be mainly undertaken by Woreda health office and primary healthcare facilities. A minimum set of NCD interventions would be made accessible in primary care facilities before any NCD screening programmes are initiated because it does not make sense to detect cases if care cannot be ensured. A primary care approach requires commitment and participation of the community. Therefore, communication messages will also be developed in order to engage the community through the health extension workers. It is to be noted that job aid has already been prepared for level 4 health extension workers on NCD prevention and control.

A proposal has been prepared to mobilize funds to integrate comprehensive NCD prevention, treatment and care services in about 36 health centers and their satellite health posts. A questionnaire is also being developed to conduct situation analysis of primary care in relation to prevention and control of NCDs. The Ministry of Health has signed MoU with few drug companies for procurement of essential medicines at a subsidized price. The training manuals and treatment protocols that are tailored to primary healthcare facilities are also being developed. After the questionnaire and training materials are finalized assessment of capacity of prima-

ry healthcare facilities for NCD prevention, treatment and care will be conducted. Then after quantification workshop will be conducted to forecast the essential medicines and technologies needed to implement the program in 36 health centers. Sensitization workshop will also be conducted for health program managers at all levels on actual implementation of the project. This will be followed by training of the primary care workforce and subsequent mentoring and supervision of primary care facilities. After implementation of the NCD prevention, treatment and care integration within 36 health centers review meeting will also be conducted to assess impact at district level. A woreda-based implementation plan and national expansion plan will be developed after the finalization of the review meeting.

8.1.3 Political Commitment to Scale up Prevention and Control of NCD in Primary Care

Sustainable scaling-up of prevention, treatment and care of major NCDs depends on acceptance and political commitment on the part of both Federal and Regional health authorities. Political commitment can be secured through policy briefs and advocacy meetings that discuss NCD issues and by highlighting National NCD action plan endorsed by the State Minister of Health in 2014. The production of the policy briefs and the convening of the advocacy seminars can be organized by the NCD unit of FMoH or any academic or teaching institution or CSO interested in enlisting support in developing an equitable NCD prevention and control service in primary care.

NCD program activities need to be linked to various levels of the health system and various directorates within the FMoH and at all level of the health system. The integration of NCD prevention and control within PHC services should result in:

- developing national NCD comprehensive guidelines for prevention, screening, diagnosis and treatment of major NCDs to be used by health posts, health centers and hospitals;
- developing training materials and organizing activities to train health workers in integrated case management;
- ensuring the supply of essential medicines and equipment;

- delivering educational messages on prevention of NCDs;
- expanding the information system so that it covers all major NCDs;
- monitoring activities for assessment of progress in implementation and impact.

Linkages should also be established with NGOs that provide health-care services. The collaboration of external allied health agencies may be critical for effective implementation of NCD programs in Ethiopia. Collaboration with other multilateral organizations and bilateral cooperation agencies is also useful in securing funding for some activities, or for implementation in specific woredas or regions, in conjunction with more general health programmes supported by the agencies.

8.1.4 Coordination and Networking with Support Directorates, Agencies, Other Ministries and the Various Levels of Care

The main directorates and authorities at federal level that should participate in the implementation of non-communicable diseases prevention and control program are:

- Human Resources Directorate: can collaborate in the contextualization of training manuals developed by Diseases Prevention and Control Directorate.
- Pharmaceuticals Fund and Supplies Agency: procure and distribute medicines and equipment for management of NCDs, supplies, laboratory materials and reagents
- Ethiopian Public Health Institute: issue guidance on laboratory procedures, undertake training and quality assurance
- Health Extension and Primary Health Directorate: develop and produce educational materials on NCDs for patients, families and communities; develop and implement advocacy, communication and social mobilization strategies
- Policy and Planning Directorate: should review the information needed to monitor and evaluate NCDs program.

- Ministry of Education: medical and nursing schools should integrate the national comprehensive guidelines for clinical and programmatic management of major NCDs into medical and nursing curricula with particular emphasis on the role of physicians and nurses in integrated approaches to the prevention and management of major NCDs.

The national programme should be integrated into existing healthcare delivery systems at different levels of care especially at primary healthcare level. The programme cannot, however, be run exclusively within any one of these levels, since activities will be concerned with different levels, or sometimes a combination of levels. Thus, many primary prevention activities may be run largely within the primary healthcare level (for example awareness creation, immunization, screening), whereas others, such as early detection and treatment activities may involve all three levels. Diagnosis and treatment require a multidisciplinary approach, and coordination among the different disciplines should be enhanced to improve quality of care. Primary healthcare facilities have a major role to play in health promotion, screening and early detection of NCDs; medical, paramedical, and health extension workers should be the resource persons for these activities, and an effective link in the referral chain. Active participation of primary healthcare workers is an important component of an effective non-communicable diseases prevention and control programme.

8.1.5 Training Primary Care Health Workers

Health workers will be prepared to assess, diagnose, manage and refer patients appropriately based on the National Comprehensive Guidelines for Clinical and Programmatic Management of Major NCDs. They will also be guided on recording and reporting of data. Trainings will be conducted to build the capacity of primary care workers to deliver integrated NCD care. The main objectives of the training are to provide the essential knowledge and skills to deliver NCD interventions as per the national NCD guidelines and to comply with the recording and reporting procedures of the information system.

In addition, health workers are expected to acquire the appropriate skills to deliver preventive health interventions. Providing health education messages and individual counselling are integral parts of the delivery of preventive health interventions in primary care. Much of these preventive health interventions will be provided by

trained nurses, health officers and health extension workers. Under the guidance and supervision of a physician, these health workers should devote adequate time to counseling patients and family members, listening to patients concerns and following up on adherence. Such approach would enhance the continuity of care and build trusting relationships that are central to primary care and free up time for physicians to perform other duties of the healthcare facility.

8.1.6 Mentoring and Supervision of Implementation of NCDs Program

Mentoring of NCD activities should be done by physicians. The activities at health centers could be supervised by general practitioners working at primary/general hospitals. The general practitionersat primary/general hospital level could in turn be supervised by internists working at general hospitals. Internists working at general hospitals could be supervised by specialists working at tertiary hospital level.

The supervision of primary healthcare facilities and woreda health offices should be carried out at least once every 3 months through a visit by NCD focal points or officials from regional health bureau. Completeness and accuracy of data recorded and collected in primary care facilities need also be supervised. This information gathered from primary care facilities will help to identify priority health problems, plan training of health personnel and provide a regular supply of consumables and essential medicines.

8.1.7 Health Management Information Systems (HMIS)

Health management information systems should be developed in order to monitor the programme processes and indicate ad hoc changes to improve them. For example, effective patient care requires timely diagnosis, treatment and adequate follow-up. A good information system should be able to identify delays or bottlenecks in the system and impediments to follow-up and adherence so that such problems can be readily solved. Ideal and comprehensive information systems can be very costly and difficult to maintain. In limited resource settings, information systems should be tailored to the basic needs of the selected priorities, and carefully developed to ensure the monitoring and evaluation of key process components and outcome measures in the priority areas.

Health information system needs to be adapted to track the availability and distribution of human resources, infrastructure, equipment, supplies and monitor the cost and impact of implementing NCD interventions in primary care. The collection of health information involves data gathering, data analysis and synthesis and use of findings for decision making. In places where there are no instruments for collection of data, an information system on the delivery of prevention and case management services needs to be developed.

8.1.8 Assessment of Capacity of Primary Care Facilities

An important step in the preliminary phase of integrating Non-communicable diseases services into primary care is to assess the capabilities of the health infrastructure to implement the program. Therefore, there is a need to collect information on the institutions that provide general health services, their organization, the number, type and distribution of the health facilities, the available resources (equipment, medicines, and health workforce), the access to and the utilization of the health services by the population. The "facility capacity questionnaire" available in the WHO PEN package can be used for this purpose or else can be integrated with service provision assessment being conducted by EPHI periodically. This "facility capacity questionnaire" helps to gather information on:

- public health sector policies in relation to: programme priorities, management of healthcare, planning and financial decentralization, community involvement, budget priorities and contribution of external financial aid to the health sector;
- managerial organization in the form of an organizational chart of the FMoH at federal, regional and woreda levels; lines of authority and linkages with primary care;
- managerial activities to implement interventions such as training and supervision;
- average catchment population for primary hospitals, health centres and health posts and maps marking the location of the health units and the major roads;
- categories of health workers managing NCD patients at primary hospitals,

health centres and health posts;

- number of persons in each category: specialists, general practitioners, nurses, other paramedical staff and community health workers;
- specialized services for NCDs at tertiary hospitals;
- availability of equipment and materials for diagnosis of major NCDs at hospitals and health centres: blood tests, ECG, radiology, pulse oximeters, peak flow meters and other relevant equipment;
- availability and quantities of medicines used for NCDs that are included in the national list of essential drugs;
- usual referral practices at first level health facilities for patients who need specialized or hospital care and types of transportation;
- description of health information system at health posts and health centres: type of information collected, frequency, forms and periodic reports;
- training needs for personnel at peripheral health units, primary hospitals and laboratories.

8.1.9 Measurement of Quality, Performance and Impact

Quality ssurance

The minimum quality assurance standards identified below can be achieved with modest investments. They form a core set of standards for improving the quality of care for people with major NCDs and will also provide simple indicators to measure the performance of the health services with regard to NCD care. Audits of these standards can be conducted to evaluate how well major NCDs are managed in primary care, given the availability of a minimum set of technologies and essential medicines. The core set of standards could be expanded when more services are delivered as the resource situation improves.

1. Registration of basic demographic and clinical data of people reporting to primary care with major NCDs

2. Early identification of people with NCDs

3. Application of evidence-based interventions in NCD prevention and care

4. Management of NCD emergencies and exacerbations

5. Monitoring of complications

6. Capacity strengthening for health system research and training

Measurement of performance and impact

Programme performance needs to be monitored to ascertain that activities are accomplished as efficiently as planned. Monitoring is carried out at the health facility through direct contact with health workers and at the district health office by examining periodic reports. Evaluation aims at measuring the progress made in achieving the programmatic objectives, detecting performance shortcomings and planning future programme reform and expansion. Evaluation should be based on valid, reliable and simple indicators. A few key indicators that can be accurately and reliably measured should be selected to evaluate managerial, operational, technical and epidemiological aspects of implementation of NCD programs. Data collected should be disaggregated by gender and social class. Tools for this purpose have been developed in collaboration with the World Health Organization.

8.2 Responsibility and Authority

Offices at different levels of the health sector from the Federal Ministry of Health to Regional Health Bureaus and Woreda Health Offices share decision making processes, powers and duties. The FMOH and the RHBs focus more on policy matters and technical support while Woreda Health Offices have basic roles of managing and coordinating the operation of a district health system under their jurisdiction. The detailed roles, mandates, and responsibilities of various levels in the implementation of NCDs prevention and control program are specified below.

Federal Ministry of Health

The Federal Ministry of Health through **the Directorate of Diseases Prevention and Control:**

- Shall provide leadership and coordination of NCDs prevention, treatment and Care Services.
- Shall identify and prioritize specialized training needs in NCDs program implementation.
- Shall ensure the training and recruitment of a core group of essential NCD experts who will be involved in training and capacity building, and who will serve as resources for referral and tertiary support.
- A National NCD Training Package with core competencies developed by a team of experts and endorsed by the FMOH shall be used during the training.
- The training package will be periodically revised and updated in light of new information, data, and challenges.
- Trainings shall be coordinated and certified by MOH and Regional Health Bureaus.
- The FMOH in collaboration with relevant stakeholders shall establish resource centers where appropriate and feasible and organize refresher courses to update service providers.
- Shall establish partnership in provision of NCDs prevention treatment, and Care Services.
- Shall develop a sustainable strategy to implement national programs for NCDs prevention, treatment and Care
- Shall regulate policy formulation.
- Shall supervise, monitor and evaluate the implementation of NCDs prevention, treatment and care services.

Consultation with all stakeholders:

- Government leadership of the national NCD agenda is key to program implementation: It means that the FMOH, RHBs, ZHDs, WorHOs at all levels of the health system own the process, have the responsibility to organize and lead the planning sessions and other processes.
- Governmental, health development partners (DPs) NGOs, CSOs, private sector, etc. will take part in the planning process for NCDs prevention treatment and care.
- Maintenance of Vertical (federal→regional→zonal→woreda) and horizontal linkage (including activities of all stakeholders operating at that particular level):
- The plans at all levels of the health system will make sure that basic NCDs prevention treatment and care are addressed at all levels of the health system while taking the local priorities into consideration.

Regional Health Bureaus

- Shall develop a regional implementation plan for NCDs prevention, treatment and care activities and allocate financial resources.
- Shall ensure that basic medications for NCDs treatment are available at different levels of the healthcare delivery system i.e. regional hospitals, zonal hospitals, etc.
- Shall ensure the training and recruitment of a core group of essential NCD experts who will be involved in training and capacity building, and who will serve as resources for referral and tertiary support.
- Shall be responsible for training and certification of service providers in accordance with FMOH Guidelines.
- Assign a unit or designate NCDs prevention, treatment and care expert for the region.

- Conduct periodic survey to maintain and update a data base of all home-based care and NCDs prevention, treatment and care schemes in their respective constituencies.
- Liaise with health facilities within MOH and other regions to ensure parity in resources and services.
- Shall supervise, monitor and evaluate the implementation of NCDs prevention, treatment and care services.

Zonal Health Departments

- Shall provide overall coordination to NCDs prevention, treatment and care delivery within the zone.
- Shall be responsible for implementing, supervising, and auditing NCDs prevention, treatment and care services at all health facilities within the zone.
- Shall be responsible for monitoring adherence to the guidelines at the zonal hospital level.
- Shall supervise, monitor and evaluate the implementation of NCDs prevention, treatment and care services.

Woreda Health Offices

- Overall managing and coordinating the operation of NCDs prevention, treatment and care
- services in the PHCU- in a primary hospital, health centers and health posts.
- Shall be responsible for implementing, coordinating, supervising, and auditing NCDs prevention, treatment and care services at all health facilities within the district
- Shall recruit or select primary healthcare workers to participate in comprehensive NCD training.
- Shall be responsible for monitoring adherence to the guidelines at the PHCU level.

- Shall monitor implementation of NCDs prevention, treatment and care services as provided by NGOs, FBOs, and CBOs at district level.

Health Extension Program at Regional, Zonal and Woreda levels and Kebele administrative councils:

- Shall provide leadership for NCDs prevention, screening, treatment and care component of the health extension program with particular emphasis on prevention, screening and treatment adherence.
- Shall ensure the community's demand for healthcare is properly addressed.
- Shall facilitate inter-sectoral collaboration for NCDs Prevention, Treatment and Care component of the health extension program.
- Shall provide guidance to enhance relevant partnership with NGOs, and other sectors.

Level of Service Provision with Corresponding Roles

Tertiary Hospital

- Shall offer specialized NCD services.
- Shall provide training & mentorship to level 1 NCD service providers.
- Shall conduct operational research to evaluate the effectiveness of NCD services.
- Shall network with lower level health facilities for referral.
- Shall conduct training of trainers (TOT) according to FMoH Guidelines.
- Shall keep appropriate records and compile monthly reports.
- Shall adhere to standards and guidelines in the management of NCD patients.

General Hospital

- Integrated NCD services provision (inpatient, outpatient);
- Shall have mechanism in place that facilitates referral for specialized interventions for control of complex NCD;
- The team shall be responsible for identification, management, follow-up and referral of patients;
- Shall keep appropriate records and compile monthly reports which shall be submitted to the zonal coordinator;
- Referral to level 3 for management of advanced NCDs;
- Shall provide mentorship to primary hospital service providers;
- Training of primary healthcare service providers;

Primary Hospital

- Integrated NCD services (outpatient);
- Shall have mechanism in place that facilitates referral for specialized interventions for control of complex NCDs;
- The team shall be responsible for identification, management, follow-up and referral of patients;
- Shall provide mentorship to health center service providers.

Health Center

- Will serve as a frontline team within the health system for integrated NCD service provision (community and outpatient).
- Shall have mechanism in place that facilitates early detection and referral of NCD patients to primary hospitals;
- Mentorship of level IV HEWs.

Health Post/ community level

- Interface between NCD care in PHC and the community by multi-purpose health workers (health extension workers);
- Outreach to patients & families to ensure effective treatment;
- Very limited dispensing of medication;
- Advice, support, education to patients & families;
- Case detection and referral;
- Community education & awareness-raising.

Non-Governmental Organizations

NGOs undertaking new primary care efforts must avoid establishing parallel primary healthcare facilities and systems in competition with the MOH system. They shall function as integral partners in the discharge, planning, and necessary support of the NCD services provision, such as in the areas of training, housing, nutrition, etc. and as such they:

- Shall provide support to MOH, regional health bureaus and other health offices in planning and implementation of NCD services;
- Shall enter into a collaborative agreement with MOH and Regional Health Bureaus to provide technical and financial support for the coordination of NCD activities;
- Shall provide programs consistent with the National NCD Guidelines and strategy;
- Shall enter into an agreement with the MOH or Regional Health Bureaus to support NCD services provision at the local health centers and primary hospitals;
- Shall coordinate with all sectors in planning and implementation of NCD services;

- Shall ensure that NCD programs-both training and service delivery are consistent with standards and guidelines set by FMOH;
- Shall assure appropriate level of skill and training based on proposed initiative;
- Shall ensure that programs are culturally appropriate and in accordance with best practices.

8.3 Monitoring and Evaluation of NCD Programme

Monitoring is conducted by collecting data (indicators) at regular intervals (monthly, quarterly or yearly) to measure the extent to which programme activities are taking place (process indicators), programme objectives are being met (outcome indicators) and the programme goal is being achieved (impact indicators).

Evaluation involves determining the relevance, adequacy, effectiveness, efficiency and impact of programme components. Different types of evaluation can be undertaken at different stages of the programme. A formative evaluation can be carried out during the planning phase, a process evaluation during the implementation phase, and a summative evaluation at the end of the programme.

Programme evaluation is "the systematic assessment of the operation and/or outcomes of a programme or policy compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the programme or policy" (Weiss, 1998). Continuous evaluation of processes and outcomes of national non-communicable diseases programme is an essential tool for assessing its organizational progress and enhancing its effectiveness.

Key indicators for major NCDs program monitoring include:

1. Morbidity attributed to hypertension

Definition: Proportion of adults 18+ years with hypertension

Formula: *Number of adults 18 years and above newly diagnosed with hypertension (OPD+IPD)* X 100

Estimated number of adults in the catchment area

2. Morbidity attributed to diabetes mellitus

Definition: Diabetes mellitus cases per 1000 population

Formula: *Number of newly diagnosed diabetes mellitus cases (OPD+IPD)* X 1000

Total population in the catchment area

3. Morbidity attributed to acute rheumatic fever

Definition: Acute rheumatic fever cases per 1000 population

Formula: *Number of patients newly diagnosed with* acute rheumatic fever *(OPD+IPD)* X 1000

Total population within the catchment area

4. Morbidity attributed to asthma

Definition: Asthma cases per 1000 population

Formula: Number of patients newly diagnosed with asthma X 1000

Total population within the catchment area

5. *Health facilities providing early detection and integrated management of major non-communicable diseases*

Definition: The proportion of facilities, by type, that provide **early detection and integrated management of major NCDs based on the national comprehensive treatment guidelines**

Formula: *Number of HFs providing early detection and integrated management of major NCDs*X100

Total number of health facilities

Appendices

Appendix 1: Classification of drugs used in the maintenance treatment of Asthma

Controllers		Relievers
Anti-inflammatory action to prevent asthma attacks	Sustained bronchodilator action but week or unproven anti-inflammatory effect	For quick relief of symptoms and use in acute attacks as PRN dosage only
Inhaled corticosteroids 1.Beclomethasone 2.Budesonide* 3.Fluticasone* 4.Ciclesonide*	**Long-acting Beta-agonists** 1.Salmetrol* 2.Formoterol*	**Short-acting Beta –agonist** 1.Salbutamol 2.Fenoterol* 3.Terbutaline*
Leukotriene modifiers 1.Montelukast 2.Zafirlukast*	**Sustained-release theophylline preparations** Theophydrine	**Anticholinergic** Ipratropium bromide*
Oral steroids 1.Prednisolone 2.Prednisone 3.Methylprednisolone 4.Methylprednisone	**Combined inhalers** 1.Salmetrol/Fluticasone 2. Budesonide/Formoterol	**Combined inhalers** Salbutamol/Ipratropium bromide

*not available in Ethiopia

Equivalent effective metered doses of inhaled corticosteroids

Drug	Low daily dose(µg)	Medium daily dose	High daily dose (µg)
Beclomethasonedipropionate-HFA	*200*	*500*	*1000*
Budesnide	*400*	*800*	*1600*
Fluticasone	*250*	*500*	*1280*
Ciclesonide	*160*	*320*	*1000*
Mommetasonefurate	*200*	*400*	*800*

***table modified from GINA 2014**

Appendix 2: Asthma Control Test

This helps to assess if asthma is controlled or not during each visit.The total score is out of 25 and if the patient scores less than19,the asthma is not controlled and treatment shoud be stepped up.

Maximum score is 25 (points are 1-5 in order as below) < 19 means asthma may not be well controlled		
In the past 4 weeks, haw much of the time did your asthma keep you from getting as much done at work, school, or home?	1	All of the time
	2	Most of the time
	3	Some of the time
	4	A little of the time
	5	None of the time
During the past 4 weeks, how often have you had shortness of breath?	1	More than once a day
	2	Once a day
	3	3-6 times a week
	4	Once or twice a week
	5	Not at all
During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?	1	4 or more nights a week
	2	2 or 3 nights week
	3	Once a week
	4	Once or twice
	5	Not at all
During the past 4 weeks, how often have you used your rescue inhaler (salbutamol)?	1	3 or more times per day
	2	1 or 2 times per day
	3	2 or 3 times per week
	4	Once a week or less
	5	Not at all
Haw would you rate your asthma control during the past 4 weeks?	1	Not controlled at all
	2	Poorly controlled
	3	Somewhat controlled
	4	Well controlled
	5	Completely controlled

Appendix 3: Diagnostic tests for diabetes mellitus

Specific diagnostic tests	Healthcare System				
	Health post	Health Center	Primary Hospital	Secondary level healthcare	Tertiary Health Care
Blood sugar determination Using glucometer or use Available laboratory service	++++	++++	++++	++++	++++
Urine analysis (dipsticks)	++++	++++	++++	++++	++++
Renal function test	____	____	++++	++++	++++
Lipid determination	____	____	++++	++++	++++
Electrolyte determination	___	____	____	++++	++++
HbA1c determination	____	____	_____	++++	++++
ECG	____	____	++++	++++	++++
Retinal Screening e.g. Ophthalmoscopy, retinaldigital photography	____	____	____	++++	++++
Neuropathy Screening Equipment e.g. monofilament, reflex Hummer, Tuning fork,	____	____	++++	++++	++++
Dialysis/Transplantation Equipment	___	____	____	___	++++

Appendix 4: Antihypertensive agents and their common side effects

Class	Examples	Usual monotherapy starting dose	Maximum daily dose	Possible side effects
Long-acting CCB	Amlodipine	2.5mg OR 5 mg OD	10 mg OD	• Oedema, Fatigue, Headache, Palpitations, Gingival Hyperplasia
	Felodipine	2.5mg OR 5 mg OD	10 mg OD	
	Nifedipine	Retard tabs: 20 mg BD LA tabs: 30 mg OD	Retard tabs: 20 mg BD LA tabs: 90 mg OD	
Thiazide diuretic	Chlorthalidone	12.5 mg OD	25 mg OD	• Hypotension, Hypokalaemia Hyponatraemia, Hyperuricaemia, Hypocalciuria, Hyperglycaemia, Rash, Dyslipidaemia, Dizziness, Paraesthesia, Epigastric distress, Anaphylaxis , Hyper cholorestenaemia, Vertigo-Malaise
	Hydrochlorothiazide (HCTZ)	12.5 mg OR 25 mg OD	50 mg OD	
	Metolazone	2.5 mg OD	5 mg OD	
Thiazide-like diuretic	Indapamide SR	1.5 mg OD	1.5 mg OD	
ACE inhibitor	Captopril	25 BD or TDS	50 mg TDS	• Cough (ACEI),Dizziness, Increased blood urea nitrogen, Hyperkalaemia, Increased serum creatinine,- Angioedema
	Enalapril	2.5-20 mg daily in 1 or 2 divided doses	40 mg daily in 1 or 2 divided doses	
	Lisinopril	10 mg OD	40 mg OD	
	Perindopril	5 mg OD	10 mg OD	
	Ramipril	2.5 mg OD	20 mg OD	
ARB	Candesartan	8 mg OR 16mg 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	320 mg OD	
	Olmesartan	20 mg OD	40 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

Appendix 5: Table: Drugs commonly used in Heart Failure

Drug	Initial dose	Target
Angiotensin-converting enzyme inhibitors		
Captopril	6.25–12.5 mg q6–8h	50 mg tid
Enalapril	2.5 mg bid	10 mg bid
Fosinopril	5–10 mg daily; can use bid	20 mg daily
Lisinopril	2.5–5.0 mg daily; can use bid	10–20 mg bid
Quinapril	2.5–5.0 mg bid	10 mg bid
Ramipril	1.25–2.5 mg bid	5 mg bid
Trandolapril	0.5–1.0 mg daily	4 mg daily
Angiotensin receptor blockers		
Valsartan[a]	40 mg bid	160 mg bid
Losartan	25 mg daily; can use bid	25–100 mg daily
Irbesartan	75–150 mg daily	75–300 mg daily
Candesartan[a]	2–16 mg daily	2–32 mg daily
Olmesartan	20 mg daily	20–40 mg daily
Thiazide diuretics		
HCTZ	25–50 mg daily	25–50 mg daily
Metolazone	2.5–5.0 mg daily or bid	10–20 mg total daily
Loop diuretics		
Bumetanide	0.5–1.0 mg daily or bid	10 mg total daily (maximum)
Furosemide	20–40 mg daily or bid	400 mg total daily (maximum)
Torsemide	10–20 mg daily or bid	200 mg total daily (maximum)
Aldosterone antagonists		
Eplerenone	25 mg daily	50 mg daily
Spironolactone	12.5–25.0 mg daily	25 mg daily
β-Blockers		
Bisoprolol	1.25 mg daily	10 mg daily
Carvedilol	3.125 mg q12h	25–50 mg q12h
Metoprolol succinate	12.5–25.0 mg daily	200 mg daily
Digoxin	0.125–0.25 mg daily	0.125–0.25 mg daily

Appendix 6: Adherence Preparation, Support and Monitoring

- Adherence means accepting, agreeing and correctly following a prescribed treatment.
- Unlike compliance, the patient is involved in decision making.
- Adherence implies understanding, consent and partnership between the care giver and patient. We have adherence to care (clinical adherence) meaning.
- Regular attendance of the patient according to given appointment, and drug adherence which means taking the drug according to instructions given by the providers.
- Adherence to life style measures is also an important component in hypertension and other chronic diseases.

Adherence preparation:

Before starting any treatment for chronic disease the patient should be assessed about his/her understanding of the condition, objectives of treatment, interest to be treated. The 5 A's of chronic care to assess and follow adherence will provide an important tool. Adherence preparation isn't imperative to start antihypertensive treatment and may be achieved while on treatment. In cases of hypertensive crisis treatment of the crisis should be a priority before adherence counseling.

Assess:

- Patient goal to the visit
- Understanding of hypertension and its complication
- Understanding of antihypertensive drug treatment
- Understanding of lifestyle measures in hypertensive treatment

Advise:

Hypertension and its complications: It's important to inform that though asymptomatic the patient may require treatment.

- Goals of treatment
- Need for lifelong treatment and follow-up
- Modalities of treatment, including life style measures

- Need for complete adherence to daily treatment and lifestyle measures
- Side effects and interaction of the drugs and how to manage. This depends on the specific medication.
- Drugs mustn't be shared.
- His/her role in the treatment: It's important to advice the patient that he/she is the one who makes the decisions and daily take the medications as well as life style measures. Thus the patient should understand that he/she shares the biggest responsibility in the management.

Agree:

- Establish that the patient is willing and motivated and agrees to treatment.
- Does the patient wants treatment and understands what it is?
- Is the patient willing to come to the required clinic for follow up?

Assist:

- Help the patient to develop resources/ support arrangements for adherence such as:
- Simplified regimen: one drug, once daily dosing as much as possible.
- Discuss schedule and reminder for the time to take the medication.
- Discuss if your clinic is suitable for the patient's follow up and arrange if he/she requires transfer.

Arrange:

- Appointment: Inform the patient of the next appointment date. Providing appointment card is also important.

Adherence Monitoring:

Once the patient is on treatment, adherence monitoring should be conducted at every visit. Good adherence is imperative for achieving the goals of antihypertensive therapy. There are many methods of assessing adherence including pill count, interviewing, etc. It's important to create a trusting relationship with the patient to obtain true information. Generally an 80% adherence to medications is said to be good in chronic care. However, it may differ from disease to disease. The 5A's are useful to monitor and support adherence.

Assess:

- Is the patient taking medications according to instructions?
- Is he/she taking life style measures recommended?
- Are there any barriers: drug cost, side effect, availability, transport cost, habits, and forgetting?

Advise:

- Reinforce information provided before.
- Advise on how to solve specific barriers to adherence.
- Provide examples from other patients' experience.

Agree:

- Make sure the patient agrees to suggested interventions.

Assist:

- Manage side effects.
- Modify/change drug regimen if necessary.

Arrange next appointment date.

- - materials.
- Motivate patients to ensure that they adhere to treatment.
- Simplify the dosage regimen (once a day dosing if possible, minimize the number of pills and select drugs that are well tolerated).
- Be sensitive to cost of pills.
- Cooperate with pharmacists.
- Use reminders.
- Involve family and relatives .

Appendix 7: Infective endocarditis

Diagnostic Clues: Fever, Hematuria, night sweat, clubbing, changing murmur, unexplained rapid deterioration, splenomegaly, far less common in pure stenotic lesions. Though history of predisposing procedures is commonly enquired, it is not commonly elicited in most of our patients.

Diagnosis is based on Modified Dukes Criteria: . In contrast to what is stated in literature, blood culture for an unknown reason is often negative. So treatment is basically empiric based on strong clinical suspicion and echocardiogrpahic finings of vegetation.

Treatment:
Empiric: All patients suspected or confirmed to have infective endocarditis should be admitted and started with antibiotics after adequate blood samples for culture are collected.

Choice Of antibiotics: Cystalline Pencilline with dose of 18 million IU per day divided into six doses for 4-6 weeks based on initial response and type of organisms identified and Gentamycin 1mg/kg every eight hours for two weeks;

-Ceftriaxone 2gm/d or ampicillin 2gm Q4hr can be substituted for crystalline penicillin. Ceftriaxone does not cover Enteococci.

In patients presenting with toxic manifestations and of short duration or patients who continued to have fever after initiation of empiric antibiotics for five days staph aureus and other resistant organisms should be considered and Vancomycin with aminoglycoside or Rifampcin should be started.

APPENDIX 8: Lists of fruits and vegetables to be used

Serving size: One standard serving=80 grams (translated into different units of cups

depending on type of vegetable and standard cup measures available in the country).

Vegetables	1 Serving size
Raw green leafy vegetables	1 cup
Other vegetables cocked chopped	½ cup
Vegetable juice	½ cup

Fruits	1 Serving size
Apple, Banana, Orange	1medium size piece
Chopped, Cooked or caned fruit	½ cup
Fruit juice	½ cup Not artificially flavored

APPENDIX 9: Moderate versus Vigorous Intensity Exercise

Moderate_ intensity Physical Activity (Approximately 3-6 METs) Requires a moderate amount of effort and noticeably accelerates the heart rate.	Vigorous-intensity Physical Activity (Approximately >6 METs) Requires a large amount of effort and causes rapid breathing and a substantial increase in heart rate.
Examples of moderate-intensity exercise include:	Examples of Vigorous-intensity exercise include:
• Brisk walking	• Running
• Dancing	• Walking / climbing briskly up a hill
• Gardening	• Fast cycling
• Housework and domestic chores	• Aerobics
• Traditional hunting and gathering	• Fast swimming
• Active involvement in games and sports with children/ walking domestic animals	• Competitive sports and games (e.g. Traditional Games, Football, Volleyball, Hockey, Basketball)
• General building tasks (e.g. roofing, thatching, painting)	• Heavy shoveling or digging ditches
• Carrying / moving moderate loads (<20kg)	• Carrying / moving heavy loads (>20kg)

Appendix 10: Examples of Foods to Eat and Foods to Avoid in the Step I and Step II Diets

Food group	Foods to eat	Foods to avoid
Lean meat, Chicken and fish (≤6 oz a d ay)	Beef, lamb—lean cuts, well-trimmed before cooking	Beef, lamb—regular, ground beef, fatty cuts, spare ribs, organ meats
	Chicken, without skin	Chicken with skin, fried chicken
	Fish,	Fried fish,
	Processed meat prepared from lean meat	Regular meat
Eggs (step I: ≤4 yolks per week; step II: ≤2 yolks per week)	Egg whites, cholesterol-free egg substitute	Egg yolks (including eggs used in cooking and baking)
Low-fat dairy products (2 to 3 servings a day)	Milk—skim, ½% or 1% low-fat milk, buttermilk	Whole milk, soy milk
	Nonfat or low-fat yogurt	Whole-milk yogurt
	Low-fat or processed cheese	Regular cheese
		Ice cream
	Low-fat coffee creamer, nonfat or low-fat sour cream	Cream
Fats and oils (≤6 to 8 teaspoons a day)	-Unsaturated oils— sunflower, corn, soybean, olive, peanut	Coconut oil, palm oil
	-Margarine and Salad dressings — made from unsaturated oils listed above, soft margarine	Butter, hard margarine Salad dressings—made with egg yolk, cheese, whole milk, sour cream
	-Seeds and nuts, peanut butter	Milk chocolate

Food group	Foods to eat	Foods to avoid
Bread and cereals (≥6 servings a day)	Whole grain breads, corn	Croissants, breads in which eggs, fat or butter are major ingredients
	Oat, wheat, corn and multigrain cereals, pasta, rice, dry beans and peas	Most granolas
	Low-fat crackers (toast, breadsticks)	High-fat crackers
	Homemade baked goods containing unsaturated oils, skim or 1% milk, egg substitute	Commercially baked biscuits, pastries, muffins containing whole milk, egg yolks, saturated oils
Soups	Low-fat and reduced-sodium varieties	Soups containing whole milk, cream, meat fat, chicken fat or skin
Vegetables (3 to 5 servings a day)	Fresh, frozen or canned vegetables without added fat or sauce	Fried vegetables or those prepared with butter, cheese or cream sauce
Fruits (2 to 4 servings a day)	Fresh, frozen, canned or dried fruits	Fried fruit or fruit served with butter or cream sauce
Sweets and modified-fat desserts	Beverages, candy made without fat, gelatin	Candy made with whole milk, chocolate, coconut oil, palm kernel oil, palm oil
		Ice cream
	Cookies, cake, pie, pudding prepared with egg substitute, skim or 1% milk, unsaturated oils	Commercially baked cakes, doughnuts, high-fat cookies prepared with egg yolks, whole milk, saturated oils

APPENDIX 11: Essential technologies and tools for implementing essential NCD interventions in primary care

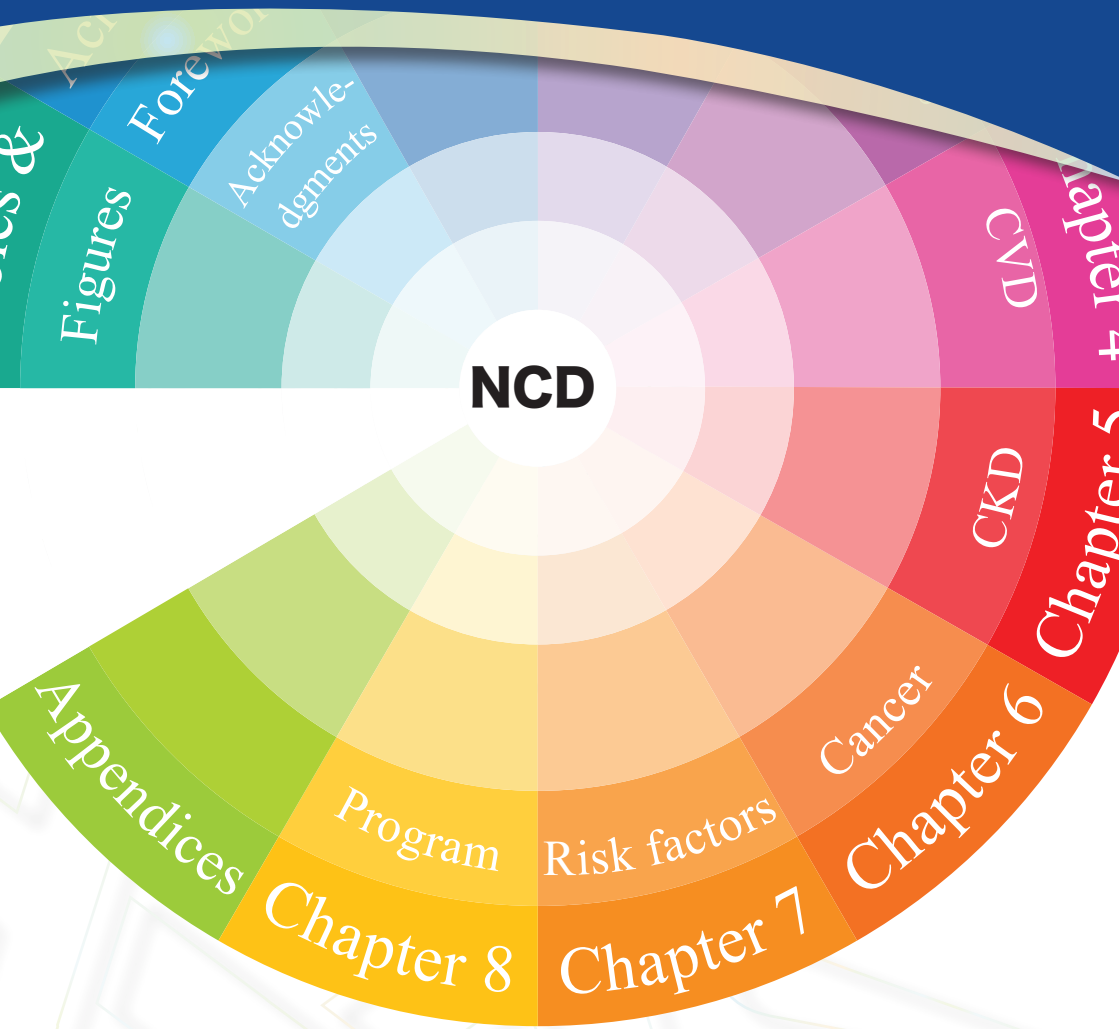
Technologies/	Tools:
Thermometer, Stethoscope, Blood pressure measurement device*, Measurement tape, Weighing machine, Peak flow meter**,S pacers for inhalers, Glucometer, Blood glucose test strips, Urine protein test strips, Urine ketones test strips,	WHO/ISH risk prediction charts, Evidence based clinicalprotocols, Flow charts with referral criteria, Patient clinical record, Medical information register, Audit tools
If available: Nebulizer Pulse oximeter Lipids Cr ECG	

* For facilities with non-physician health workers a validated blood pressure measurement device with digital reading is preferable for accurate measurement of blood pressure.

** Disposable mouth pieces required. Peak flow meters with one-way flow is preferable.

APPENDIX 12: Core list of medicines required for implementing essential NCD interventions in primary care

For Primary Care facilities with Physicians(for PC facilities with only non-physician health workers; most of the medicines below are required for refill of prescriptions issued by physicians at a higher level of care):	
Thiazide diuretic, Calcium channel blocker(amlodipine), Beta-blocker(atenolol), Angiotensin converting enzyme inhibitor(enalapril), Statin(simvastatin), Insulin,Metformin, Glibenclamide,Isosorbide dinitrate, Glyceryl trinitrate,Furosemide, Spironolactone, Salbutamol,Prednisolone, Beclometasone,	Aspirin, Paracetamol, Ibuprofen, Codeine, Morphine, Penicillin, Erythromycin, Amoxicillin, Hydrocortisone, Epinephrine, Heparin, Diazepam, Magnesium sulphate, Promethazine, Senna, Dextrose infusion, Glucose injectable solution, Sodium chloride infusion, Oxygen.



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