

National Programme for Prevention and Control of Diabetes, Cardiovascular Disease and Stroke



Guidelines on Assessment and Management of Cardiovascular Risk for Medical Officers

Partner:

Department of Cardiology,
Dr Ram Manohar Lohia Hospital and associated Postgraduate
Institute of Medical Education and Research,
New Delhi-110001

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PREFACE

The incidence of cardiovascular disease is increasing day by day and is presently gaining an epidemic proportion in India. Presently about 20-25% of all hospital admissions and 25% of all mortality is due to coronary artery disease. Population surveys from India have reported 9-fold increase in its prevalence and expected to cause doubling of deaths due to CVD by 2015. This increase in incidence may be contributed to unhealthy dietary practice, lack of physical exercise, tobacco consumption, stress etc.

Multiple community level interventions in different parts of the world have shown that atherosclerotic cardiovascular diseases can be effectively prevented by modifying the risk factors at a very early stage, before the disease process has set in (Primary prevention) or after an event has occurred, to decrease the recurrence (Secondary prevention). Lack of proper guidelines in this regard is making it difficult to intervene at the community level.

The guidelines on assessment and management of cardiovascular risk for medical officers were prepared for National Programme for Prevention and control of Diabetes, Cardiovascular diseases and Stroke (NPDCS) after going through all relevant national and international literatures and different guidelines available including that of World Health Organization. The draft document was presented to various expert groups in different workshops. After taking inputs and suggestions given by the experts, the final document was prepared.

We hope that the guidelines will immensely help the medical officers in implementing the goals of NPDCS.

Dr. (Prof) Harsh Wardhan
Dr. Ranjit Kumar Nath

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Introduction

Cardiovascular disease is a major cause of disability and premature death throughout the world. The underlying pathology is atherosclerosis, which develops over many years and is usually advanced by the time symptoms occur, generally in middle age.

The epidemic of cardiovascular disease in India is advancing rapidly. Overview of population surveys conducted over two decades in India reported 9-fold increase in the prevalence of Coronary Heart Disease. It has been estimated that there will be doubling of deaths due to cardiovascular disease (CVD) in India by 2015¹.

Acute coronary events and other cardiovascular events frequently occur suddenly, and are often 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.

This booklet provides evidence-based guidelines on how to reduce the occurrence of first and recurrent clinical events due to coronary heart disease (CHD), cerebrovascular disease (CeVD) and peripheral vascular disease (PVD) in two categories of people in Indian context. They include:

1. People with risk factors who have not yet developed clinically manifest cardiovascular disease (Primary Prevention)
2. People with established CHD, CeVD or Peripheral vascular disease (Secondary Prevention)

The evidence-based recommendations given in Part 1 of these guidelines provide guidance on which specific preventive actions to initiate, and with what degree of intensity. The accompanying World Health Organization/ International Society of Hypertension (WHO/ISH) risk prediction charts enable the estimation of total cardiovascular risk of people in the first category.

People in the second category have high cardiovascular risk and need intensive lifestyle interventions and appropriate drug therapy as elaborated in Part 2 of these guidelines. Risk stratification using risk charts is not required for making treatment decisions in them.

Settings

Primary care and other levels of care including low resource settings.

Resource Needs

- *Human resources:* Medical doctors and health workers
- *Equipment:* Stethoscope, accurate blood pressure measurement device, measuring tape and weighing machine, equipment for testing urine glucose and urine albumin, and assay of blood glucose and lipid profile.
- *Drugs:* Thiazide diuretics, Beta blocker, Angiotensin converting enzyme inhibitors/receptor blockers, Calcium channel blockers, Aspirin, Metformin, Glibenclamide, Insulin, and Statins (Simvastatin or Atorvastatin).
- *Other facilities:* system for maintaining medical records, referral facilities.

What are the goals of implementing these guidelines?

The goals are to prevent CHD, CeVD and PVD events by lowering cardiovascular risk. The recommendations assist people to:

- Quit tobacco use, or reduce the amount smoked, or not just start the habit
- Make healthy food choices
- Be physically active
- Reduce body mass index, waist hip ratio/waist circumference
- Lower blood pressure
- Lower blood cholesterol and low density lipoprotein cholesterol(LDL-cholesterol)
- Control hyperglycaemia
- Take anti platelet therapy when necessary.

Who needs referral to a specialist facility?

Referral is required if there are clinical features suggestive of:

- Acute cardiovascular events such as: heart attack, angina pectoris, heart failure, arrhythmias, transient ischemic attack, and stroke.
- Secondary hypertension or malignant hypertension.
- Diabetes mellitus (newly diagnosed or uncontrolled).
- Established cardiovascular disease (newly diagnosed or if not assessed in a specialist facility).
- People needing medical therapy to quit smoking.

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

Part I: Assessing and managing cardiovascular risk in people with risk factors who have not yet developed clinically manifest cardiovascular disease (primary prevention)

1.1. When is grading cardiovascular risk using charts unnecessary for making treatment decisions?

Some individuals are at high cardiovascular risk because they have established cardiovascular disease or very high burden of risk factors. Risk stratification is not necessary for making treatment decisions for these individuals as they belong to the high risk category; all of them need intensive lifestyle interventions and appropriate drug therapy^{2,3}. They include people:

- with established cardiovascular disease
- without established CVD who have a total cholesterol ≥ 320 mg/dl or low-density lipoprotein (LDL) cholesterol ≥ 240 mg/dl or TC/HDL-C (total cholesterol/high density lipoprotein cholesterol) ratio >8
- without established CVD who have persistent elevated blood pressure of $\geq 160/ \geq 100$ mmHg
- with renal failure or renal impairment.

1.2. Instructions for using WHO/ISH risk prediction charts

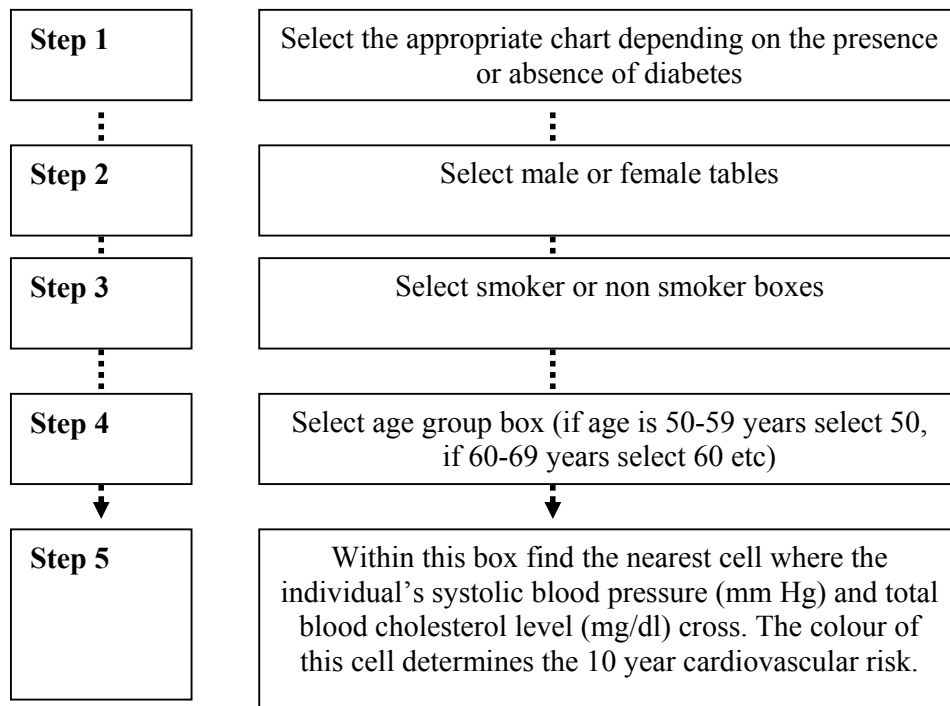
These WHO/ISH risk prediction charts indicate 10-year risk of a fatal or nonfatal major cardiovascular events (myocardial infarction or stroke), according to age, gender, blood pressure, smoking status, total blood cholesterol and presence or absence of diabetes mellitus. There are two sets of charts. 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 persons, particularly to change behaviour and, when appropriate, to take antihypertensives, lipid-lowering drugs, and aspirin.

1.3. How do you use the charts to assess cardiovascular risk?

- If blood cholesterol can be measured, refer to chart 1.
- If blood cholesterol cannot be measured due to resource limitations, refer to chart 2.
- Before applying the chart to estimate the 10 year cardiovascular risk of an individual, the following information is necessary
 - Presence or absence of diabetes^{*}
 - Gender
 - Smoker or non-smoker^{**}
 - Age
 - Systolic blood pressure (SBP)^{***}
 - Total blood cholesterol.

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



* A person who has diabetes is defined as someone taking insulin or oral hypoglycaemic drug(s), or with a fasting venous plasma glucose concentration ≥ 126 mg/dl or a postprandial (approximately 2 hours after a main meal) venous plasma glucose concentration ≥ 200 mg/dl on two separate occasions. For very low resource settings urine sugar test may be used to screen for diabetes if blood glucose assay is not feasible. If urine sugar test is positive a confirmatory blood glucose test needs to be arranged to diagnose diabetes mellitus.

** All current smokers and those who quit smoking less than 1 year before the assessment are considered smokers for assessing cardiovascular risk.

*** Systolic blood pressure, taken as the mean of two readings on each of two occasions, is sufficient for assessing risk but not for establishing a pre-treatment baseline.

1.4. WHO / ISH Risk prediction CHARTS

Chart 1: 10 year risk of a fatal or non fatal cardiovascular event by gender, age, systolic blood pressure, total blood cholesterol, smoking status and presence or absence of diabetes mellitus

WHO/ISH risk prediction chart applicable for Indian population

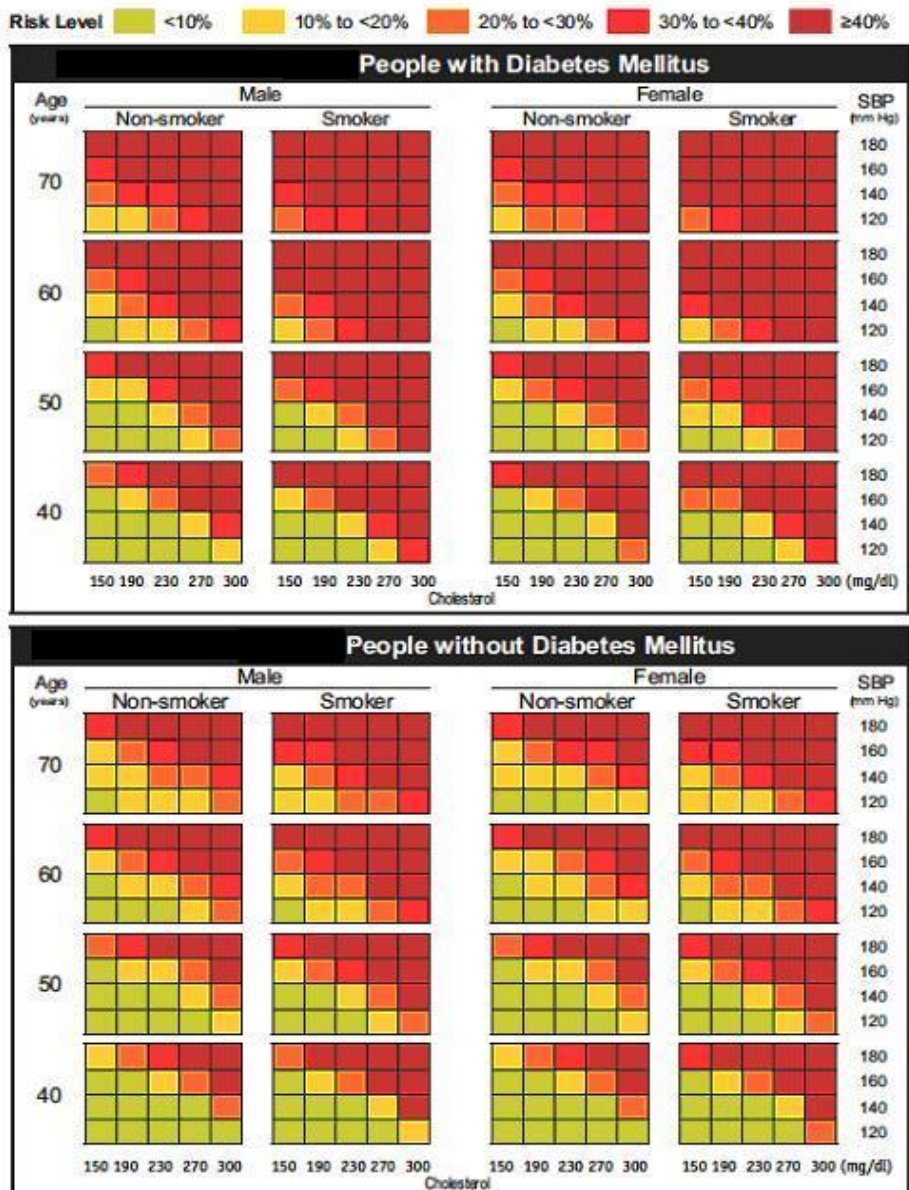
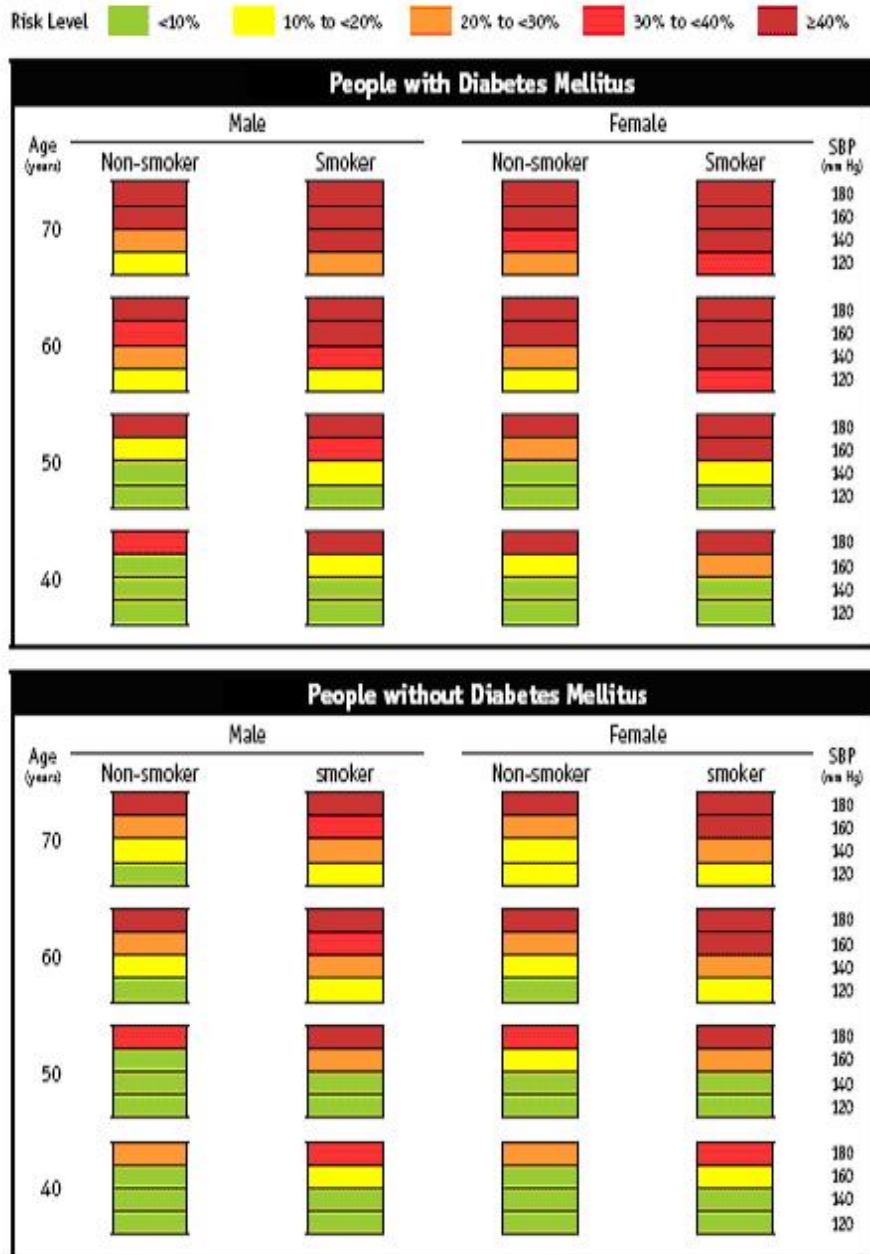


Chart 2: 10 year risk of a fatal or non fatal cardiovascular event by gender, age, systolic blood pressure, smoking status and presence or absence of diabetes mellitus



1.5. Practice points

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 relatives (male < 55 years, female < 65 years)
- Raised triglyceride level (≥ 150 mg/dl)
- Low HDL cholesterol level (≤ 40 mg/dl in males, ≤ 50 mg/dl in females)
- Fasting glycaemia, or impaired glucose tolerance
- Microalbuminuria
- Socioeconomic deprivation.

1.6. Recommendations for prevention of cardiovascular disease in people with cardiovascular risk factors (according to individual total risk)

10 year risk of cardiovascular event	Risk classification	Intervention
Risk <10%	LOW RISK	Low risk does not mean “no” risk. Conservative management focusing on lifestyle interventions is suggested. Risk assessed after 5 years unless significant change in health status.
Risk 10% to <20%	MODERATE RISK	Monitor risk profile every 2 years.
Risk 20% to <30%	HIGH RISK	Monitor risk profile yearly.
Risk $\geq 30\%$	VERY HIGH RISK	Individuals in this category are at very high risk of fatal or non-fatal vascular events. Monitor risk profile every 3–6 months.

1.7. Lifestyle Modification

a. DIET

- Increase intake of green leafy vegetables and fresh fruits.
- Consume less salt; avoid adding/sprinkling salt to cooked and uncooked food.
- Preparations which are high in salt and need to be moderated are: Pickles, chutneys, sauces and ketchups, papads, chips and salted biscuits, cheese and salted butter, bakery products and dried salted fish.

- Restrict all forms of sugar free and refined carbohydrates for example biscuits, breads, naan, kulchas, cakes, mathris etc.
- Steamed and boiled food should be preferred over fried food.
- Have fresh lime water instead of carbonated drinks.
- Avoid eating fast/junk foods and aerated drinks. Instead of fried snacks, eat a fruit.
- In practice, it is best to use mixture of oils. Either buy different oils every month or cook different food items in different oils.
- Oils which can be mixed and matched are mustard oil, soya bean oil, groundnut oil, olive oil, sesame oil, and sunflower oil.
- Ghee, vanaspati, margarine, butter and coconut oil are harmful and should be moderated.
- If you are a non vegetarian, try to take more of fish and chicken. They should not be fried. Red meat should be consumed in small quantities and less frequently.

b. PHYSICAL ACTIVITY

- Physical activity is a key determinant of energy expenditure.
- Regular exercise is important for promoting weight control or weight loss.
- Exercise regularly (moderate to vigorous) for 5-7 days per week; start slowly and work up gradually
 - At least 30 minutes (accumulated) of physical activities per day for cardiovascular disease protection.
 - 45 minutes/ day (accumulated) for fitness.
 - 60 minutes/ day (accumulated) for weight reduction.
- Discourage spending long hours in front of television.
- Encourage outdoor activities like cycling, gardening etc.

Yoga: A holistic life style which includes Asanas and all other components of healthy life style like low fat vegetarian diet (Satvik diet), stress management, tobacco avoidance and physical exercise. They have the potential for primary and secondary prevention of heart disease.

c. WEIGHT CONTROL#

All individuals who are overweight or obese should be encouraged to lose weight through a combination of a low calorie diet and dynamic physical activity.

d. TOBACCO CESSATION

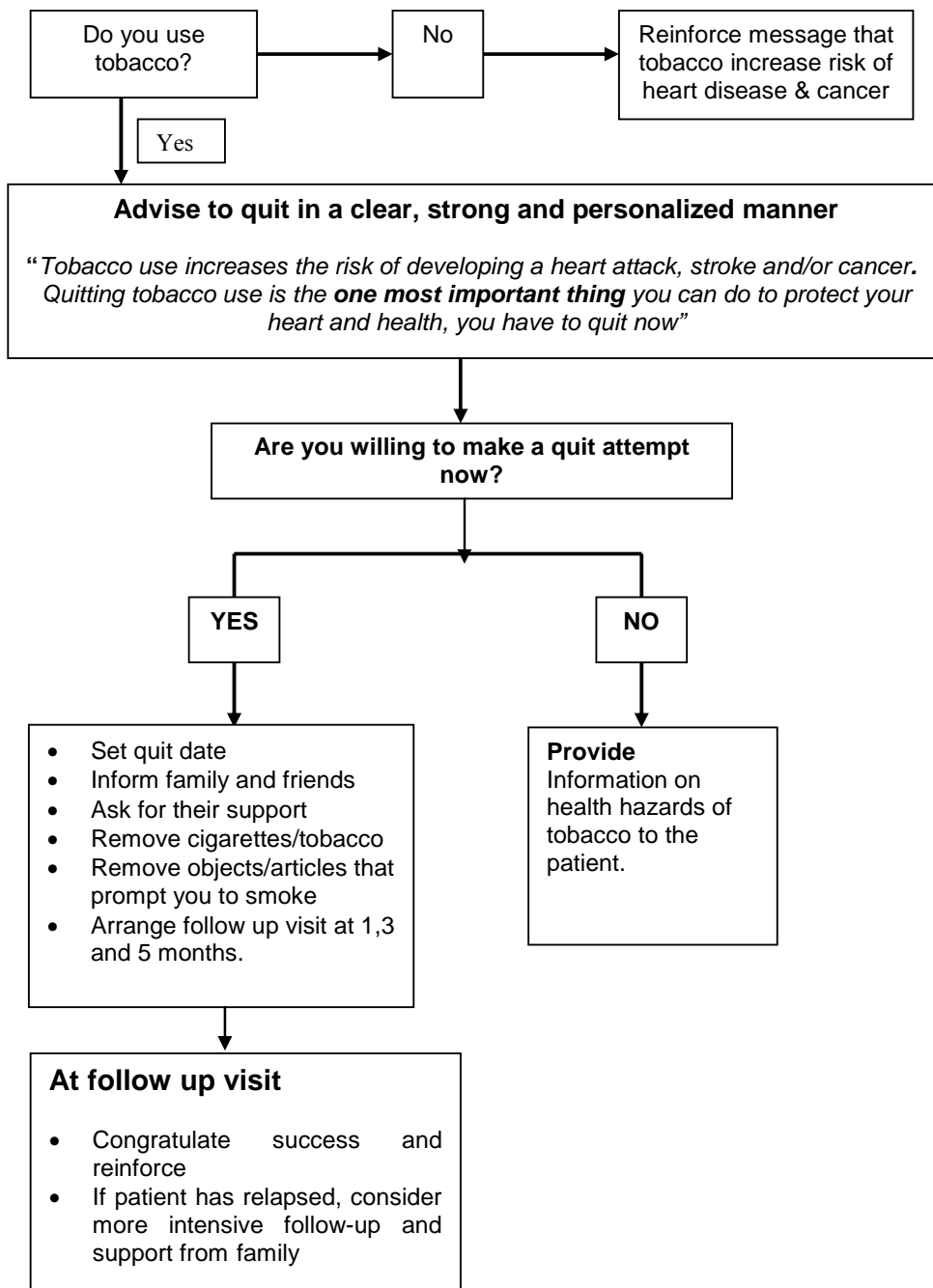
All non-smokers should be encouraged not to start smoking.

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

It is recommended that those who use other forms of tobacco should also be advised to stop. The following flow chart depicts the protocol for counselling on tobacco cessation using the 5 steps -5 A approach⁴.

Overweight or obesity is assessed by measuring body mass index (BMI), which is calculated as weight in kg/height in meter². For Indian population 18.5 to 22.9 BMI is normal, 23 to 24.9 is considered as overweight and BMI of ≥ 25 is considered as obesity. Waist circumference is also an important measure of central obesity and it should be <90 cm for men and <80 cm for women. Another measure of central obesity is Waist to Hip Ratio (WHR). Normal WHR is <0.85 for women and <0.95 for men⁵.

**PROTOCOL FOR COUNSELING ON CESSATION OF TOBACCO USE
(5 STEPS– 5As)**



USE 5 STEPS- 5 As- ASK, ADVISE, ASSESS, ASSIST, ARRANGE.

e. ALCOHOL

All individuals should avoid alcohol.

1.8. PHARMACOTHERAPY

a. 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.

Risk <10%

Individuals with persistent blood pressure $\geq 140/90$ mmHg should continue non pharmacologic therapy like lifestyle strategies to lower blood pressure and have their blood pressure and total cardiovascular risk reassessed every five years depending on clinical circumstances and resource availability.

Risk 10% to <20%

Individuals with persistent blood pressure $\geq 140/90$ mmHg should continue non pharmacologic therapy like lifestyle strategies to lower blood pressure and have their blood pressure and total cardiovascular risk reassessed every two years depending on clinical circumstances and resource availability.

Risk 20% to <30%

Individuals with persistent blood pressure $\geq 140/90$ mmHg who are unable to lower blood pressure through lifestyle strategies with professional assistance within a year 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.

An ACE inhibitor or calcium channel blocker is recommended as first line therapy.

Risk $\geq 30\%$

Individuals with persistent blood pressure $\geq 130/80$ mmHg despite aggressive lifestyle measures for 4 – 6 months 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. An ACE inhibitor or calcium channel blocker is recommended as first line therapy.

b. LIPID-LOWERING DRUGS (STATINS)

All individuals with total cholesterol at or above 320 mg/dl should be advised to follow a lipid-lowering diet along with intensive lifestyle measures and given a statin to lower the risk of cardiovascular disease.

All other individuals need to be managed according to the 10-year cardiovascular risk as follows:

Risk <10%

Should be advised to follow a non pharmacologic therapy like lipid-lowering diet and other lifestyle measures.

Risk 10 to <20%

Should be advised to follow a non pharmacologic therapy like lipid-lowering diet and other lifestyle measures.

Risk 20 to <30%

Adults >40 years with persistently high serum cholesterol (>200 mg/dl) and/or LDL cholesterol >130 mg/dl, despite a lipid-lowering diet and other lifestyle measures for a year, should be given a statin.

Risk \geq 30%

Individuals in this risk category should be advised to follow a lipid-lowering diet, aggressive lifestyle measures and a statin should be started.

Serum cholesterol should be reduced to less than 200mg/dl (LDL cholesterol to below 100mg/dl) or by 25% (30% for LDL cholesterol), whichever is greater.

c. HYPOGLYCAEMIC DRUGS

Individuals with persistent fasting blood glucose \geq 126mg/dl despite lifestyle management should be given Metformin. If blood glucose remains high despite maximum doses of Metformin, add Glibenclamide and/or Insulin as appropriate.

d. ANTIPLATELET 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 clear.

Aspirin should probably *not* be given to individuals in this risk category.

Risk \geq 30%

Individuals in this risk category should be given low-dose aspirin.

1.9. DRUGS THAT ARE NOT RECOMMENDED

Hormone replacement therapy and vitamin supplements are not recommended for reduction of cardiovascular risk.

Best Practice points:

©Unless there are compelling indications to use specific drug, the least expensive preparation of the above classes of drugs should be used.

©Good quality generic preparations of medicines listed in the essential medicines list (annexure) are recommended.

©The most cost effective preventive treatments are aspirin and initial antihypertensive treatment with low dose thiazide.

©Intensive antihypertensive treatment and statin treatment are less cost effective. In limited resource settings a cost effective prevention strategy could offer aspirin and initial antihypertensive treatment to all at high risk before offering intensive antihypertensive treatment and statins.

Part 2: Management of people with established CHD, CeVD or peripheral vascular disease (Secondary Prevention)

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

2.1. Recommendations for prevention of recurrent CHD (heart attacks) and CeVD (stroke) events

a. LIFESTYLE ADVICE

Intensive life style advice (Tobacco cessation, encouragement of healthy diet, promotion of physical activity and stopping alcohol consumption) as described earlier; should be followed simultaneously with drug treatment. Supervised programmes of exercise should where feasible be offered to all subjects recovering from major CHD events and CeVD events.

b. PHARMACOTHERAPY

ANTIHYPERTENSIVE DRUGS

Blood pressure reduction should be considered in all patients with established CHD, particularly with a blood pressure level $\geq 140/90$ mmHg. Lifestyle factors (particularly high alcohol intake) should be addressed first and if blood pressure is still $\geq 140/90$ mmHg, drug treatment is indicated. In patients with CHD, beta blockers should be given along with ACE Inhibitor/ ARB. When beta-blocker and ACE Inhibitor 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 130/80-85 mmHg is appropriate.

Blood pressure reduction should be considered in all patients with previous TIA or stroke to achieve a target of $<130/<80-85$ mmHg by ACEI/ARB/CCB/thiazide.

LIPID LOWERING DRUGS

Treatment with statins is recommended for all patients with established CHD, unless contraindicated.

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 and peripheral vascular disease, especially if they also have evidence of established CHD.

Frequent monitoring of blood cholesterol levels is not mandatory. A total cholesterol of less than 150 mg/dl and LDL-cholesterol of less than 70 mg/dl, or a reduction of 25% in total cholesterol and 30% in LDL-cholesterol, whichever is greater, may be the desirable goal.

Other lipid lowering agents are not recommended, either as an alternative to statins or in addition to them.

HYPOGLYCEMIC DRUGS

Secondary prevention of CHD, CeVD and PVD is important in patients with diabetes, whether type 1 or type 2. Individuals with persistent fasting blood glucose > 110mg/dl despite diet control and aggressive lifestyle measures should be given Metformin. If the fasting blood glucose remains >126 mg/dl despite maximum doses of Metformin, Glibenclamide and/or insulin should be added as appropriate.

ANTIPLATELET DRUGS

All patients with established CHD should be treated with low dose 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.

ACE INHIBITORS

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.

BETA BLOCKERS

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

ANTICOAGULANTS

Long term anticoagulation is not recommended in patients with a history of stroke or transient ischemic attack (TIA) who are in sinus rhythm.

Long term anticoagulation is recommended for patients with a history of stroke or TIA who are in atrial fibrillation, at low risk of bleeding and in whom treatment with anticoagulants can be safely monitored. If anticoagulant monitoring is not possible, or if a patient cannot take anticoagulants, treatment with aspirin should be offered.

2.2. CORONARY REVASCULARIZATION

CABG (coronary artery bypass graft) surgery should be considered as an adjunct to optimal medical treatment including aspirin, nitrates, lipid lowering treatment, ACE inhibitors and beta-blockers in those patients at moderate and high risk who are considered likely to have left main stem or triple vessel disease.

PTCA (percutaneous transluminal coronary angioplasty) should be considered for relief of refractory angina despite optimal medical treatment. The decision in this regard as to which type of revascularization strategy is better for a given patient should be taken by a specialist care physician.

2.3. CAROTID ENDARTERECTOMY or STENTING

Carotid endarterectomy reduces the risk of recurrent stroke and death among patients with a previous TIA or non-disabling stroke in patients with severe ipsilateral carotid stenosis (70–99%) and possibly in patients with moderate degrees of stenosis (50–69%) though not in milder degrees of stenosis. Suitable patients may be considered for carotid stenting. The decision regarding which type of revascularization strategy will be better for a given patient should be taken by a specialist care physician.

2.4. DRUGS THAT ARE NOT RECOMMENDED

Based on current evidence, type 1 antiarrhythmics, antioxidant vitamins, folate, and hormone replacement therapy are not recommended for CHD, CeVD and PVD patients.

Best Practice points:

Unless there are compelling indications to use specific drugs, the least expensive preparation of the above classes of drugs should be used.

Good quality generic preparations of medicines listed in the essential medicines list (annexure) are recommended.

REFERENCES

¹ World Health Organization. Preventing chronic diseases a vital investment.. Geneva, 2005.

² World Health Organization. Prevention of Cardiovascular Disease- Guidelines for assessment and management of cardiovascular risk. Geneva, 2007.

³ World Health Organization. Prevention of Recurrent Heart attack and strokes in low and middle income populations. Evidence based recommendations for policy makers and health professionals. Geneva, 2007.

⁴ World Health Organization. Preventing Chronic Diseases a vital investment. 2005.

⁵ International Diabetes Institute and WHO 2000.

ANNEXURE 1

LIST OF ESSENTIAL MEDICINES AND DAILY DOSAGES

Class of drug	Drug	Daily dosage
Angiotensin converting enzyme inhibitors (ACEI)	Enalapril Lisinopril	Initial dose 2.5–5.0 mg twice daily, increasing to 10–20 mg twice daily
	Ramipril	Starting at 1.25 mg once daily, increasing to 10mg once daily
CCBs (Calcium Channel Blockers)	Amlodipine	Starting at 2.5 mg daily, increasing upto 10mg daily
Angiotensin-II Receptor Blockers	Losartan	Starting at 25mg increasing upto 100mg/day, can be given in two divided dosages
Thiazide diuretics	Hydrochlorothiazide	Starting at 12.5 mg once daily
Beta-blockers	Metoprolol Sustained Release	Starting at 25 mg once daily, increasing upto 100 mg once daily
Lipid lowering therapy	Simvastatin, Atorvastatin	Initial dose 10 mg once after dinner, increasing to 40 mg once after dinner
Antiplatelet therapy	Aspirin	150 mg daily after meal
Hypoglycemic drugs	Metformin	Starting at 250 mg increasing to 1.0 g twice/three times daily before meals
	Glibenclamide	Starting at 2.5 mg increasing to 5 mg once/ twice daily before meals

ANNEXURE 2

INVESTIGATORS

Dr. (Prof) Harsh Wardhan
Dr. Ranjit Kumar Nath

Consultant and Head,
Assistant Professor,
Department of Cardiology,
Dr. Ram Manohar Lohia Hospital
and associated PGIMER,
New Delhi -110001.

EXPERTS

Dr. A. K. Aggarwal
Dr. W. D. Bhutia
Dr. Sandeep Bansal
Dr. Vivek Chaturvedi
Dr. Anil Chaturvedi
Dr. H. K. Chopra
Dr. Ashok Das
Dr. Sridhar Dwivedi
Dr. Vijay Grover
Dr. Sudhir Gupta
Dr. V. K. Gupta
Dr. D. C. Jain
Dr. Peeyush Jain
Dr. Sitanshu Kar
Dr. Rajesh Kumar
Dr. (Col) S. K. Malani
Dr. S. C. Manchanda
Dr. Prashant Mathur
Dr. Ranjit Kumar Nath
Dr. Neeraj Pandit
Dr. S. N. Panday
Dr. D. Prabhakaran
Dr. Ritu Rana
Dr. Ambuj Roy
Dr. Yash Pal Sharma
Dr. N. P. Singh
Dr. R. S. K. Sinha
Dr. D. K. Taneja
Dr. Yonas Tegegn
Dr. J. S. Thakur
Dr. Harsh Wardhan

Abbreviations

CVD	Cardiovascular disease
CHD	Coronary heart disease
CeVD	Cerebrovascular disease
PVD	Peripheral vascular disease
WHO	World Health Organization
ISH	International Society of Hypertension
LDL	Low density lipoprotein
TC	Total cholesterol
HDL	High density lipoprotein
SBP	Systolic blood pressure
BMI	Body mass index
WHR	Waist to hip ratio
ACE	Angiotensine converting enzyme
ACEI	Angiotensine converting enzyme inhibitor
ARB	Angiotensine receptor blocker
CCB	Calcium channel blocker
TIA	Transient ischemic attack
MI	Myocardial infarction
CABG	Coronary artery bypass graft
PTCA	Percutaneous transluminal coronary angioplasty

**Guidelines on
Assessment and Management of
Cardiovascular Risk for Health Workers**

WHO / ISH Risk prediction Charts for Health Workers

Instructions for using WHO/ISH risk prediction charts

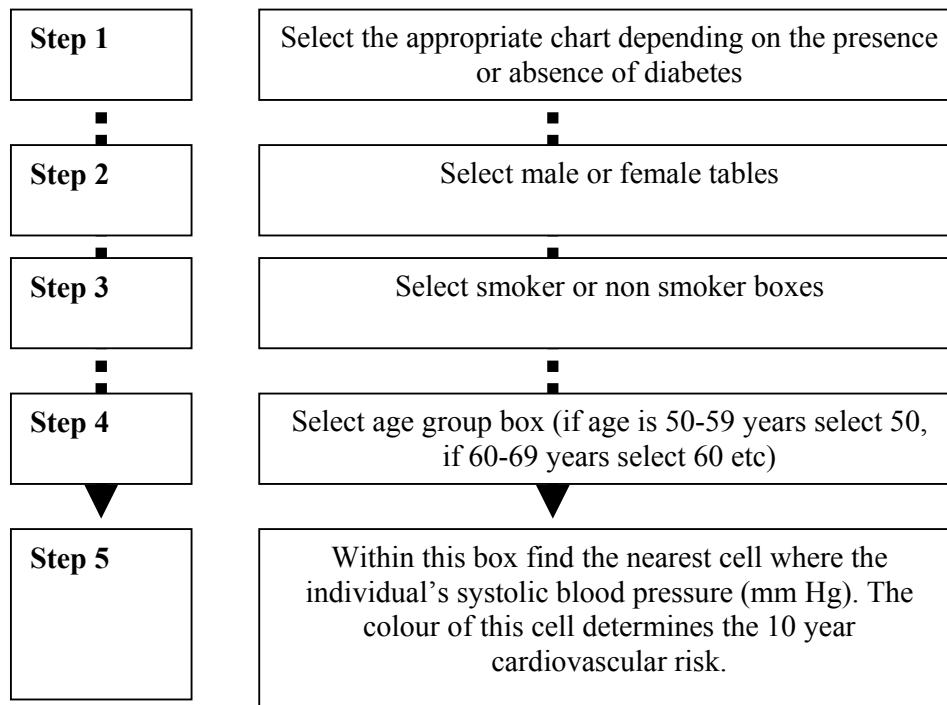
These WHO/ISH risk prediction charts indicate 10-year risk of a fatal or nonfatal major cardiovascular events (myocardial infarction or stroke), according to age, gender, blood pressure, smoking status and presence or absence of diabetes mellitus.

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 persons, particularly to change behaviour and, when appropriate, to take antihypertensives, lipid-lowering drugs, and aspirin.

How do you use the charts to assess cardiovascular risk?

- ■ Before applying the chart to estimate the 10 year cardiovascular risk of an individual, the following information is necessary
 - ● Presence or absence of diabetes *
 - ● Gender
 - ● Smoker or non-smoker **
 - ● Age
 - ● Systolic blood pressure (SBP) ***

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

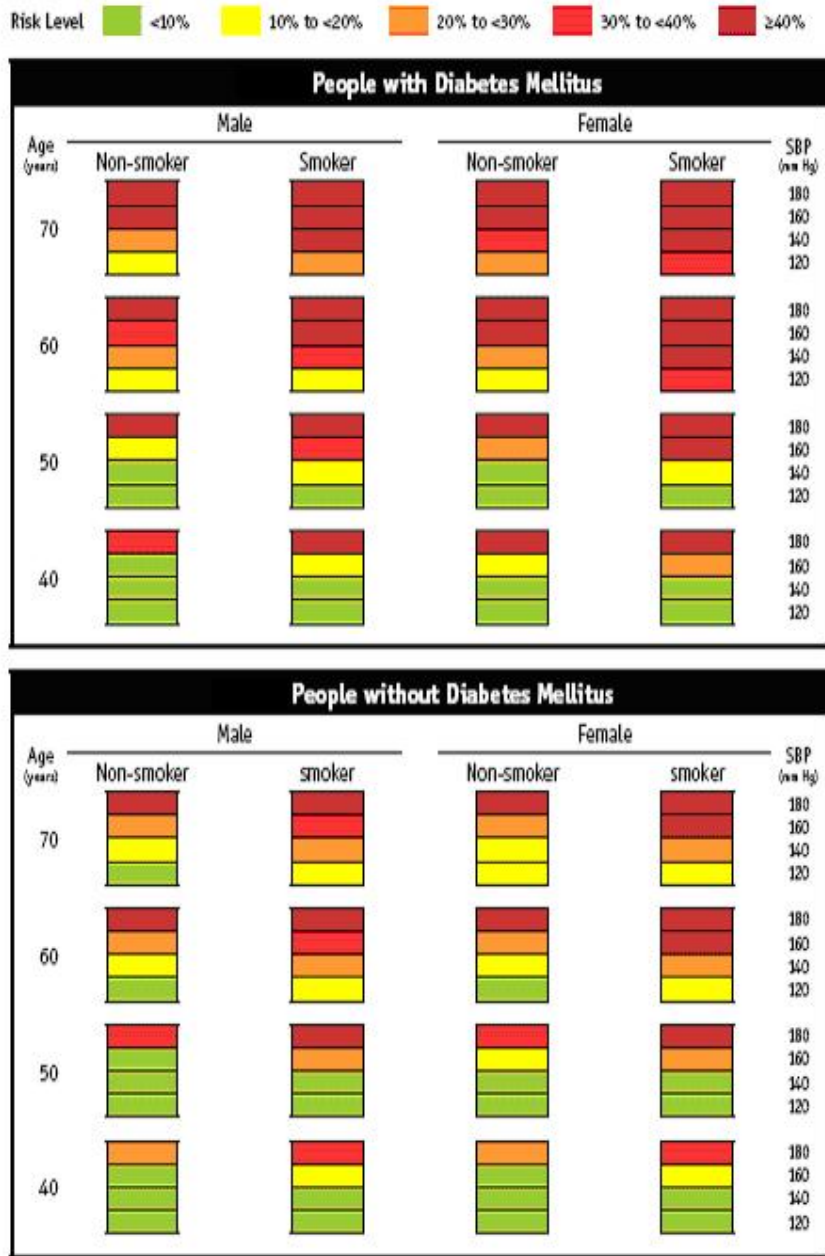


* A person who has diabetes is defined as someone taking insulin or oral hypoglycaemic drug(s), or with a fasting venous plasma glucose concentration ≥ 126 mg/dl or a postprandial (approximately 2 hours after a main meal) venous plasma glucose concentration ≥ 200 mg/dl on two separate occasions. For very low resource settings urine sugar test may be used to screen for diabetes if blood glucose assay is not feasible. If urine sugar test is positive a confirmatory blood glucose test needs to be arranged to diagnose diabetes mellitus.

** All current smokers and those who quit smoking less than 1 year before the assessment are considered smokers for assessing cardiovascular risk.

*** Systolic blood pressure, taken as the mean of two readings on each of two occasions, is sufficient for assessing risk but not for establishing a pre-treatment baseline.

Chart 1: 10 year risk of a fatal or non fatal cardiovascular event by gender, age, systolic blood pressure, smoking status and presence or absence of diabetes mellitus



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

10 year risk of cardiovascular event	Risk classification	Intervention
Risk <10%	LOW RISK	<p>Low risk does not mean “no” risk. Encourage for lifestyle modification (promote healthy diet, physical activity, say no to tobacco and alcohol)</p> <p>Risk assessed after 5 years unless significant change in health status. Refer to medical doctors for evaluation and management</p>
Risk 10% to <20%	MODERATE RISK	<p>Monitor risk profile every 2 years.</p> <p>Encourage for lifestyle modification (promote healthy diet, physical activity, say no to tobacco and alcohol)</p> <p>Refer to medical doctors for evaluation and management</p>
Risk 20% to <30%	HIGH RISK	<p>Monitor risk profile yearly.</p> <p>Encourage for lifestyle modification (promote healthy diet, physical activity, say no to tobacco and alcohol)</p> <p>Refer to medical doctors for evaluation and management</p>
Risk ≥30%	VERY HIGH RISK	<p>Individuals in this category are at very high risk of fatal or non-fatal vascular events Monitor risk profile every 3–6 months</p> <p>Encourage for lifestyle modification (promote healthy diet, physical activity, say no to tobacco and alcohol)</p> <p>Refer to medical doctors for evaluation and management</p>

Health workers should identify high risk individuals by using the chart and refer them to the nearest health facility for confirmation and appropriate management. Health workers should help/ assist the person to change their life style by giving following advice.

Lifestyle Modification

a. DIET

- Increase intake of green leafy vegetables and fresh fruits.
- Consume less salt; avoid adding/sprinkling salt to cooked and uncooked food.
- Preparations which are high in salt and need to be moderated are: Pickles, chutneys, sauces and ketchups, papads, chips and salted biscuits, cheese and salted butter, bakery products and dried salted fish.
- Restrict all forms of sugar free and refined carbohydrates for example biscuits, breads, naan, kulchas, cakes, mathris etc.
- Steamed and boiled food should be preferred over fried food.
- Have fresh lime water instead of carbonated drinks.
- Avoid eating fast/junk foods and aerated drinks. Instead of fried snacks, eat a fruit.
- In practice, it is best to use mixture of oils. Either buy different oils every month or cook different food items in different oils.
- Oils which can be mixed and matched are mustard oil, soya bean oil, groundnut oil, olive oil, sesame oil, and sunflower oil.
- Ghee, vanaspati, margarine, butter and coconut oil are harmful and should be moderated.
- If you are a non vegetarian, try to take more of fish and chicken. They should not be fried. Red meat should be consumed in small quantities and less frequently.

b. PHYSICAL ACTIVITY

- Physical activity is a key determinant of energy expenditure.
- Regular exercise is important for promoting weight control or weight loss.
- Exercise regularly (moderate to vigorous) for 5-7 days per week; start slowly and work up gradually
 - At least 30 minutes (accumulated) of physical activities per day for cardiovascular disease protection.
 - 45 minutes/ day (accumulated) for fitness.
 - 60 minutes/ day (accumulated) for weight reduction.
- Discourage spending long hours in front of TV.
- Encourage outdoor activities like cycling, gardening etc.

Yoga: A holistic life style which includes Asanas and all other components of healthy life style like low fat vegetarian diet (Satvik diet), stress management, tobacco avoidance and physical exercise. They have the potential for primary and secondary prevention of heart disease.

c. WEIGHT CONTROL#

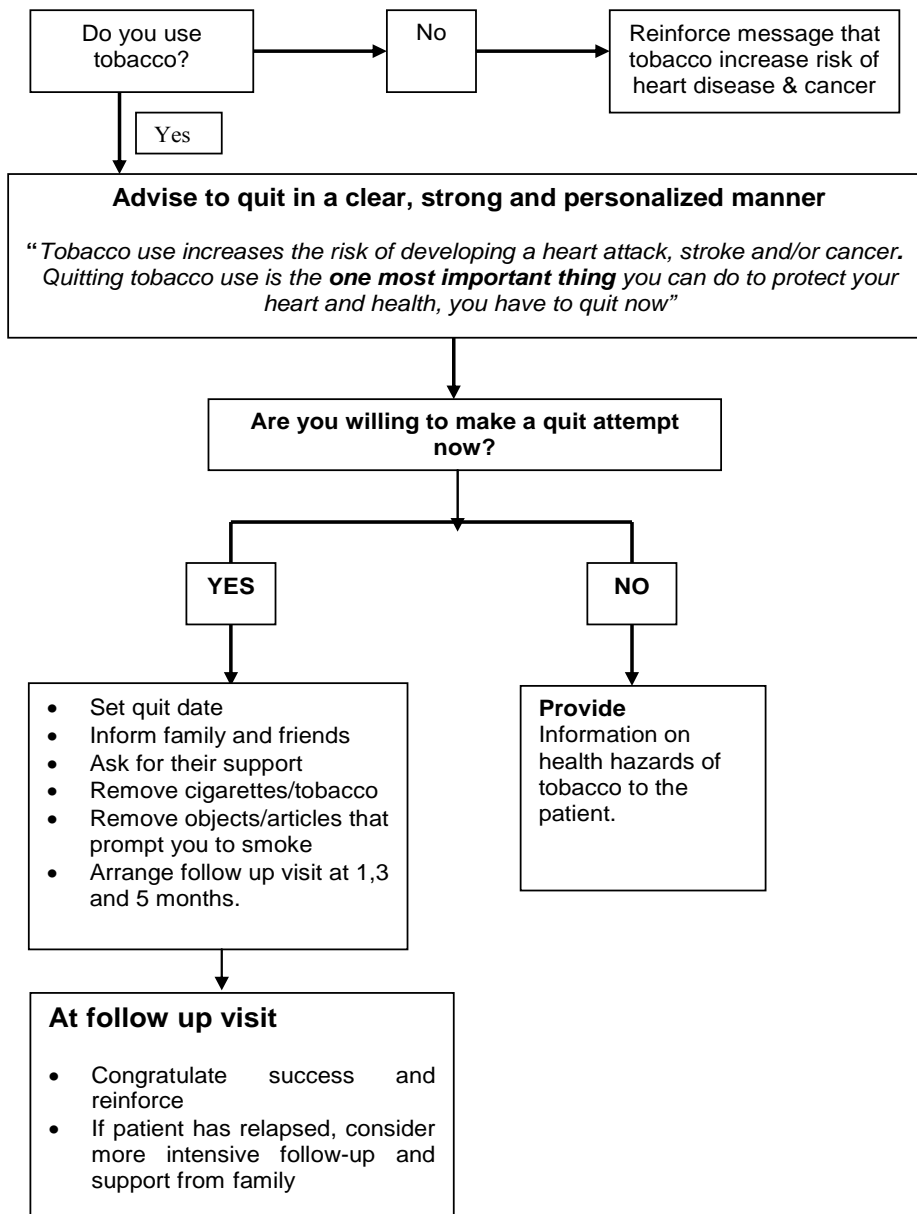
All individuals who are overweight or obese should be encouraged to lose weight through a combination of a low calorie diet and dynamic physical activity.

Overweight or obesity is assessed by measuring body mass index (BMI), which is calculated as weight in kg/height in meter². For Indian population 18.5 to 22.9 BMI is normal, 23 to 24.9 is considered as overweight and BMI of ≥ 25 is considered as obesity.

d. TOBACCO CESSATION

All non-smokers should be encouraged not to start smoking.
All smokers should be strongly encouraged to quit smoking by a health professional through Lifestyle modification including YOGA and supported in their efforts to do so.
It is recommended that those who use other forms of tobacco be advised to stop. The following flow chart depicts the protocol for counselling on tobacco cessation using the 5 steps -5 A approach⁴.

PROTOCOL FOR COUNSELING ON CESSATION OF TOBACCO USE (5 STEPS- 5As)

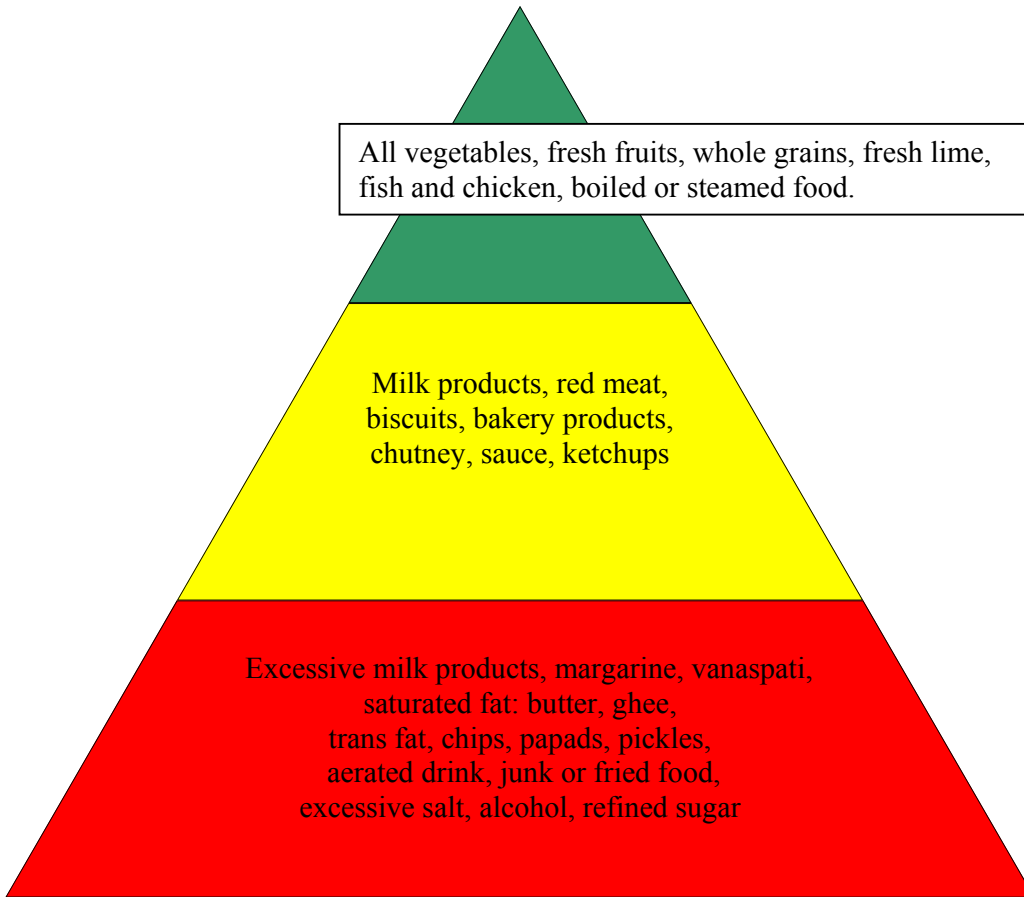


USE 5 STEPS- 5 As- ASK, ADVISE, ASSESS, ASSIST, ARRANGE.

e. ALCOHOL

All individuals should avoid alcohol.

FOOD PYRAMID



Good for Health: can be taken as much as needed



Need to be taken in moderation



Not good for Health, needs restriction