Government of West Bengal
State NCD Cell
Health & Family Welfare Department
National Health Mission
GN-29, 4th Floor, Swasthya Sathi Building, Swasthya Bhawan Premises, Sector - V
Salt-Lake, Bidhannagar, Kolkata – 700091

Memo no. HFW-27024/50/2019-SPSRC SEC-Dept. of H&FW/149 **Dt.** 30/06/2025

To,
The Principal & MSVP of all Medical Colleges & Teaching Institution
The Chief Medical Officer of Health of all Districts & Health District
Superintendents/BMOHs of all hospitals and health centres

Madam/Sir,

Cardiovascular diseases (CVD) account for one third of the deaths in most Indian states. Uncontrolled high blood pressure is the major cause for heart attacks and stroke. India has 20 crore people with high blood pressure of which only 2 crores have blood pressure under control. West Bengal has 22% prevalence of hypertension and approximately one crore adults with hypertension.

In an aim to achieve the goal of 25% relative reduction in the prevalence of raised blood pressure by 2025, state had already adopted a standard treatment protocol & guideline during 2019. Hypertension being a silent killer, controlling that with un-interrupted drug and lifestyle modification is a major challenge. In consideration of newer drugs and specific conditions some evidenced based changes have now been implemented in the previous protocol to archive 50~75% control of patients suffering from hypertension.

THUS, A REVISED STATE SPECIFIC STANDARD TREATMENT PROTOCOL & GUIDELINE FOR HYPERTENSION is hereby prepared (Annexed) by the state technical committee and medical teachers of West Bengal, considering evidenced based safety, efficacy, and cost benefit issues. Strict adherence of the protocol is desirable for put on treatment of all new hypertensive patients until complication and other co-morbid situation arises (also included in protocol) in life saving condition.

Director of Medical Education
Govt. of West Bengal

Director of Health Services
Govt. of West Bengal

Government of West Bengal, Department of Health & F.W

Hypertension Protocol

❖ Measure Blood Pressure of **all adults over 30# years**

High BP: SBP ≥ 140 and/ or, DBP ≥ 90 mm Hg

❖ Check for compliance at each visit before titration of dose or addition of drugs

Step 1 If BP is high *
- **Prescribe Amlodipine 5 mg**

Step 2 After 30$ days if BP is still high
- **Increase to Amlodipine 10 mg**

Step 3 After 30 days if BP is still high
- **Add Telmisartan 40 mg**

Step 4 After 30 days if BP is still high
- **Increase to Telmisartan 80 mg**

Step 5 After 30 days if BP is still high
- **Add Chlorthalidone 6.25 mg ****

Step 6 After 30 days if BP is still high
- **Increase to Chlorthalidone 12.5 mg ****

Step 7 After 30 days if BP is still high
- **Check if the patient has been taking medications regularly and correctly. If yes, refer to a specialist**

 # for routine screening above 30y are target, but hypertension can occur after 18y also

* If SBP ≥ 180 or, DBP ≥ 110, refer patient to a specialist
- If SBP 160-179 or, DBP 100-109, start treatment on the same day
- If SBP 140-159 or, DBP 90-99, check on a different session and if still elevated, start treatment.

** Hydrochlorothiazide can be used if Chlorthalidone is not available.

$ The usual follow-up interval of 30 day can be altered depending on seriousness of patient.

Gestational Hypertension
- DO NOT give any ARBs, ACE inhibitors, Statins, Diuretics to women who are or could become pregnant
- Choice of anti-hypertensives: Labetalol 50-300 mg/ day > Hydrallazine 25-50 mg/ day > Methyldopa 250-1000 mg/ day > Nifedipine 10-60 mg/ day
- Follow detail guideline for Tier wise management

Diabetic patients
- Treat diabetes according to Std. treatment protocol
- Aim for BP target within SBP 130/ DBP 85

Heart attack in last 3 years
- Add beta blocker (bisoprolol / metoprolol) to Amlodipine with initial treatment

Heart attack or stroke, ever
- Begin low dose aspirin (75 mg) and Statin

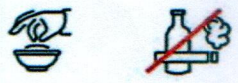
People with high CVD risk
- Consider aspirin and statin

Chronic kedney disease
- ACEI or, ARB are preferred if close clinical and biochemical monitoring is possible

Home measurement of BP is encouraged with proper training

[Follow detail guideline overleaf for complicated & special cases]

Lifestyle advice for all patients



Reduce salt, < 5 gm/day | Avoid tobacco and alcohol | Exercise at least 30min. per day for 5 day a week | Reduce weight, if overweight | Eat less fried/fatty foods (Trans fats <2.2 g/day for a 2,000 cal. diet)

- ✓ Eat sufficient quantity of fruits and vegetables per day.
- ✓ Avoid papads, chips, pickles etc.
- ✓ Use healthy oils like , mustard sunflower, or groundnut.
- ✓ Reduce weight if overweight. (BMI <23 Kg/m²
- ✓ Limit consumption of foods containing high amounts of trans fatty acid/ saturated fats.
- ✓ Reduce fat intake by changing how you cook:
  - ✓ Remove the fatty part of meat
  - ✓ Use vegetable oil
  - ✓ Boil, steam, or bake instead of fry
  - ✓ Limit reuse of oil for frying
- ✓ Avoid processed foods containing trans fats.
- ✓ Avoid added sugar.

- Dispense drugs for 30 days and give appointment after 28 days
- Medications should be taken at the same time each day

SOP for Blood Pressure Measurement

BP can be measured by Nursing Staff / Attending Doctor.

Preparation:

1. **Patient Preparation:** Ensure the patient has been resting comfortably for at least 5 minutes, with feet flat on the ground and back supported. The bladder should be evacuated. Patient should not have smoked in last 30 minutes, not drink Coffey or tea for last 30 min.
2. **Environment:** Use a quiet room with a comfortable temperature.
3. **Equipment:** Ensure the BP cuff size is appropriate (bladder length should be 80-100% of the arm circumference) and inspect for damage or defects.

Procedure:

1. **Positioning:**
    - Have the patient sit upright with back supported.
    - Arm should be supported at heart level.
    - Preferably leave all clothing around the arm. If not possible, one thin layer of clothing may be allowed in special cases.
2. **Digital BP Measurement:**
    - Apply cuff to the bare upper arm.
    - Position the cuff snugly, aligning with the brachial artery.
    - Start the measurement per manufacturer's instructions (typically pressing a button).
    - Remain quiet and still during measurement.
    - Records of systolic and diastolic readings displayed on the screen.
3. **Aneroid BP Measurement:**
    - Inflate cuff manually to 30 mmHg above the point where the radial pulse disappears.
    - Slowly deflate cuff, noting systolic pressure (Korotkoff sounds first heard) and diastolic pressure (Korotkoff sounds disappear).
    - Read the pressure on the manometer.

Post-Measurement:

1. **Recording:** Document the recorded values clearly without rounding off, noting the arm used and patient's position.
2. **Rechecking:** If initial measurement is high, recheck after a few minutes.
3. **Patient Advice:** Provide feedback and advice based on the readings obtained.

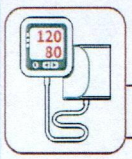
Additional Tips:

- **Calibration:** Regularly calibrate and maintain equipment to ensure accuracy.
- **Training:** Ensure healthcare providers are trained in proper techniques and follow SOPs consistently.
- **Documentation:** Record any factors that may influence reading (e.g., medication, stress).

STEPS FOR ACURATE BLOOD PRESSURE MEASUREMENT

1. Before measurement

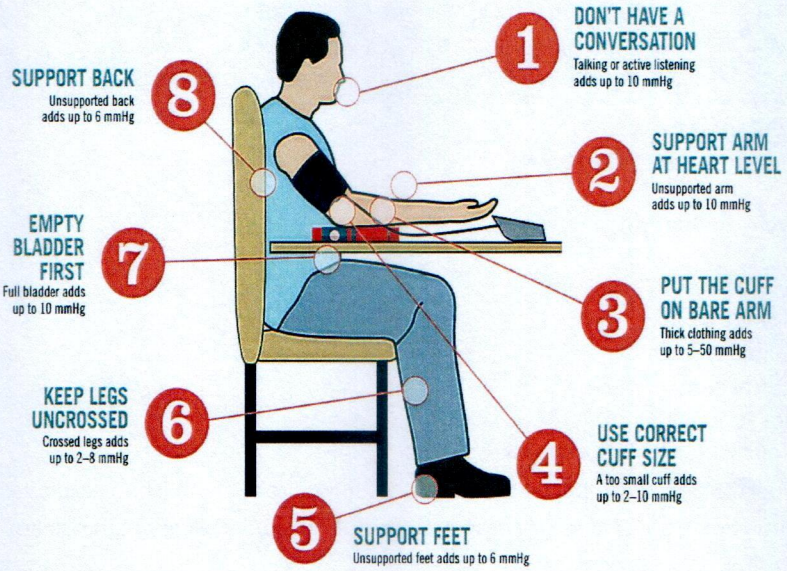
- ✔ Provide a quiet environment at a comfortable temperature.
- ✔ Explain the procedure to be performed.
- ✔ Check that the patient:
  - Has **NOT** smoked or ingested food, coffee, or alcohol in the last **30 MINUTES**
  - Has had at least **5 MINUTES** of rest.



USE A CLINICALLY VALIDATED BLOOD PRESSURE MEASURING DEVICE

2. During measurement

- ✔ **Ensure** these 8 conditions are met



3. After measurement

- ✔ **Obtain** a **SECOND MEASUREMENT** with an interval of **30 SECONDS**
- ✔ Register both **MEASUREMENTS WITHOUT ROUNDING** and calculate the **AVERAGE** to obtain the **FINAL RESULT**

A detailed technical guideline is also enclosed for ready reference:

Technical Guideline for the Management of Hypertension, 2025, West Bengal

1. DIAGNOSTIC CRITERIA OF HYPERTENSION

18 years or above

Office Systolic Blood Pressure ≥140 mmHg and/or Diastolic Blood Pressure ≥90 mmHg measured on at least two occasions.

Below 18 years of age

Office Systolic and/or Diastolic Blood Pressure persistently ≥95th percentile for age, sex and height.

2. GRADE OF HYPERTENSION

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

3. EVALUATION OF HYPERTENSION

Step 1: - BP measurement (see above)

Step 2: - Lifestyle Evaluation

1. Sedentary lifestyle
2. High salt intake
3. Smoking habit
4. Excess alcohol consumption
5. Excess stress

Step 3: - Cardiovascular Risk Factor Assessment

Along with hypertension those patients who have concomitant established cardiovascular disease or diabetes mellitus or chronic kidney disease are considered to be at very high risk and should be referred to tertiary care centre.

CVD Risk Factors Common in Patients with Hypertension

Modifiable Risk Factors	Relatively Fixed Risk Factors
• Current Smoking, Secondhand Smoking • Diabetes • Dyslipidemia • Overweight / Obesity • Physical inactivity / low fitness • Unhealthy diet	• CKD • Family History • Increased Age • Male sex • Low socioeconomic/educational status • Obstructive sleep apnea • Psychological Stress

Basic Laboratory Test	Fasting Blood Glucose Serum Creatinine with eGFR Urinalysis
2nd Tier	Complete Blood Count Lipid Profile Serum Sodium, Potassium Urea, Creatinine Uric Acid Urinary Albumin to Creatinine Ratio Thyroid Profile ECG, Halter
3rd Tier	Echocardiogram, Angiogram, CT-Angiogram

4. MANAGEMENT OF HYPERTENSION

A. What Should Be the Treatment Target Range of Blood Pressure

The treatment target range of Systolic BP depends on the associated comorbid diseases and age of the patient. In patients aged 18 to 65 years, the Systolic BP target range should be less than 130 mmHg or less, if tolerated, but not less than 120 mmHg.

In patients over 65 years of age, the Systolic BP target range should between 130 to 139 mmHg.

Diastolic BP Target Range is between 70 to 79 mmHg in all cases

B. Control Value for Hypertension

SBP < 140 mmHg and/or, DBP < 90 mmHg

C. Lifestyle Management

Lifestyle management is no less important than pharmacological management.

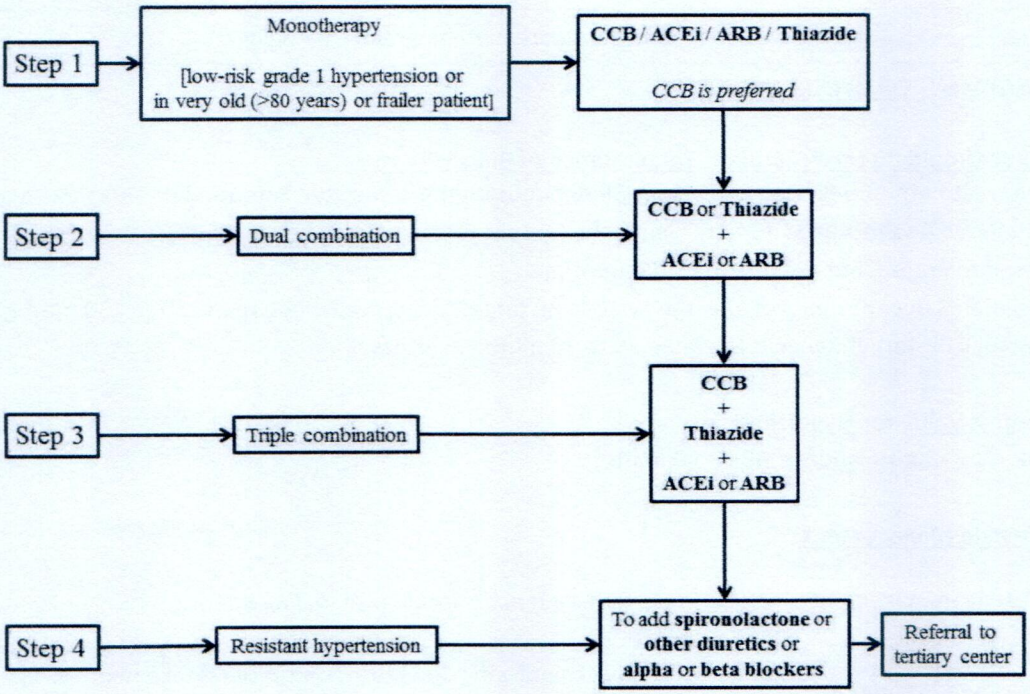
1	**Salt Reduction**	Less than 5 gm (One teaspoonful) salt intake per day. To avoid extra salt or salty food.
2	**Heart-Healthy Diet**	To eat a healthy, balanced, low fat diet with more vegetables, fresh fruits, low-fat dairy products and fish. To avoid red meat and sugar-sweetened soft drinks.
3	**Weight Reduction**	For those who are overweight or obese. Maintenance of BMI of 20 - 25 kg/m2
4	**Increased Physical Activity**	At least 30 minutes of moderate intensity aerobic exercise, namely walking, cycling or swimming, at least 5 days/week
5	**Potassium Supplementation**	
6	**Cessation of Tobacco Smoking**	
7	**Abstinence from alcohol or moderation in alcohol**	

C. Pharmacological Management

When to initiate Antihypertensive Treatment

Initiation of antihypertensive drug treatment in hypertension depends on the stage of hypertension, cardiovascular risk score and associated target organ damage. The following flowchart shows the approach.

How to initiate Antihypertensive Treatment



How to Escalate Antihypertensive Treatment. Example.

- To initiate with Amlodipine 5 mg OD.
- Follow-up after 4 -6 weeks. BP uncontrolled. To increase Amlodipine to 10 mg OD.
- After 1 month BP uncontrolled. To add Telmisartan 40 mg OD.
- After 1 month BP uncontrolled. To increase Telmisartan to 80 mg OD.
- After 1 month BP uncontrolled. To add Chlorthalidone 6.25 – 12.5 mg OD.

Drugs with Dosages and Side Effects

Group	Drugs	Doses (mg/day)	Daily Frequency	Adverse Effects
First Line Drugs				
CCB (Calcium Channel Blockers)	Amlodipine	2.5 - 10	1	Ankle edema,
	Cilnidipine	5 - 20	1 or 2	
ACEi (ACE Inhibitors)	Enalapril	5 - 40	1 or 2	Angioedema, Cough, Hyperkalemia
	Ramipril	2.5 - 20	1 or 2	
ARB (Angiotensin Receptor Blockers)	Losartan	50 - 100	1 or 2	Angioedema, Hyperkalemia
	Olmesartan	20 - 40	1	
	Telmisartan	20 - 80	1	
	Valsartan	80 - 320	1	
Thiazide Diuretics	Hydrochlorothiazide	12.5 - 25	1	Hyponatremia, Hypokalemia
	Chlorthalidone	6.25 - 25	1	
Second Line Drugs				
Loop Diuretics	Furosemide	20 - 80	2	Hypokalemia
	Torsemide	5 - 40	1	
Aldosterone Antagonist	Spironolactone	25 - 100	2	Hyperkalemia
	Eplerenone	50-100	1 or 2	
Beta Blockers	Bisoprolol	1.25 - 10	1	Bradycardia, Hypotension Contraindicated in Bronchial Asthma
	Metoprolol succinate	50- 200	1	
	Nebivolol	2.5 - 20	1	
	Carvedilol	12.5 - 50	2	
	Labetelol	100 - 800	2	
Alpha-1 Blocker	Prazosin	2 - 20	2	1st dose hypotension
Centrally Acting	Clonidine	- 0.8	2	Rebound hypertension
	Methyldopa	250 - 500	2	
Vasodilators	Hydralazine	100-200	2-3	Hypotension
	Minoxidil	5 - 50	1-3	

5. SPECIAL SITUATIONS

- **Hypertension with Diabetes Mellitus:** Proteinuria should be looked for in patients with Hypertension and Diabetes. ACEi / ARB is the drug of choice if proteinuria is present.
- **Hypertension with Chronic Kidney Disease:** If Albumin to Creatinine ratio is >300 ACEi / ARB should be the first line. Where eGFR is <30 or Hyperkalemia is present, ACEi / ARB should be avoided. CCBs / Diuretics should be the first line drugs. Beta-blockers, Alpha-blockers or Vasodilators may be considered as add ons.
- **Hypertension with Associated Cardiovascular Risk Factors:** Beta-Blockers are the preferred first line in CVD. ACEi / ARB can be used. Statin therapy as per ASCVD score.

❖ Management of Gestational Hypertension

Step 1: Diagnosis & Classification

- 🔷 BP 140–159/90–109 mmHg → Gestational Hypertension
- 🔷 BP ≥160/110 mmHg → Severe Gestational Hypertension
- 🔷 Hypertension + Proteinuria/End organ damage = **Pre-eclampsia** + Seizures = **Eclampsia**

Step 2: Management Based on Severity

- 🔷 If Mild Hypertension (BP 140–159/90–109 mmHg):
- ✅ First-Line Treatment:
  - ➢ Methyldopa (250 mg TID) or
  - ➢ Labetalol (100 mg BID) or
  - ➢ Nifedipine SR (10 mg BID)
- ✅ Supportive Care:
  - ➢ Lifestyle modifications (low-salt diet, moderate activity)
  - ➢ Monitor BP every 2 weeks
  - ➢ Fetal monitoring (growth scan, Doppler, fetal movements)
- 🔶 Referral to Higher Center If:
  - ➢ BP ≥160/110 mmHg
  - ➢ Symptoms of preeclampsia (headache, vision changes etc.) – refer with loading dose of MagSulph

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- 🔷 If Severe Hypertension (BP ≥160/110 mmHg):
  - ➢ 🏥 Immediate hospital admission (Secondary/Tertiary Care Level)
- 💊 First-Line Treatment:
  - ➢ IV Labetalol (20 mg bolus → Repeat every 10–30 min up to 300 mg) or
  - ➢ Oral Nifedipine (10 mg every 30 min, max 40 mg/day)
- 💊 Alternative Treatment:
  - ➢ IV Hydralazine (5–10 mg slow IV every 20 min if BP remains high)
  - ➢ 💉 In PET settings give $MgSO_4$ as per norm
- 🔍 Monitoring:
  - ➢ BP every 15–30 min until controlled
  - ➢ Urine protein, platelet count, liver function tests
  - ➢ Fetal well-being (Doppler, CTG)
- 🚨 Referral to Tertiary Care If:
  - ➢ No BP control despite treatment
  - ➢ Signs of impending eclampsia

- 🔷 If Eclampsia (BP ≥160/110 + Seizures):
  - ➢ 🚨 Emergency ICU Admission
  - ➢ 💉 Magnesium Sulfate ($MgSO_4$) Protocol:
    - ○ Loading dose: 4 g IV over 10 min + 5 g IM in each buttock
    - ○ Maintenance dose: 5 g IM on alternate buttock every 4 hr.ly for 24 hours after last seizure or, delivery whichever is later
- 💊 BP Management:
  - ➢ IV Labetalol or IV Hydralazine (as in severe HTN)
- 📅 Delivery Plan:
  - ➢ If ≥34 weeks: Induce labor or C-section
  - ➢ If <34 weeks: Consider steroids for fetal lung maturity

Step 3: Management Based on Healthcare Level

Healthcare Level	Mild Hypertension	Severe Hypertension	Eclampsia
Primary Care (PHC/CHC)	Methyldopa, Labetalol	Referral if BP ≥160/110	Referral, initiate $MgSO_4$ if available
Secondary Care (District Hospital)	Labetalol, Nifedipine	IV Labetalol, Hydralazine	Full $MgSO_4$ protocol, ICU admission
Tertiary Care (Medical College/Hospital)	Continue treatment	ICU monitoring, fetal assessment	Emergency delivery if necessary

Step 4: Postpartum Management

- ✅ Monitor BP every 4–6 hours for 48 hours postpartum
- ✅ Continue antihypertensives for 2–6 weeks (Methyldopa, Labetalol, or Nifedipine)
- ✅ Breastfeeding-Safe Medications: Methyldopa, Labetalol, Nifedipine
- ✅ Follow-up BP Check at 6 Weeks Postpartum to assess for chronic hypertension

6. RESISTANT HYPERTENSION

When the recommended treatment plan fails to lower systolic and diastolic blood pressure values to **<140 mmHg and/or <90 mmHg** respectively, even after three drugs on maximum tolerable doses blood pressure remains uncontrolled in patients whose adherence to therapy has been confirmed. The recommended treatment line includes optimum lifestyle measures and treatment with **optimal doses of drugs including ACEI or ARB, CCB and thiazide diuretic**. Its reported prevalence rate ranges from 5-30% in patients with treated hypertension.

7. SECONDARY HYPERTENSION

Secondary hypertension is defined as hypertension with identifiable cause. Its prevalence ranges from 5 to 15% in hypertension patients. An exhaustive investigation should be the strategy to diagnose the identifiable cause, when clinical suspicion of secondary hypertension is strong. Certain clinical indicators of secondary hypertension are

a. Younger patients (< 40 years) with grade 2 hypertension
b. Onset of any grade of hypertension in childhood
c. Resistant hypertension
d. Grade 3 hypertension
e. Hypertensive emergency
f. Presence of severe target organ damage

8. PATIENT FOLLOW-UP

Patient should be followed up within two months after initiation of drug therapy. Degree of blood pressure control and side effect of drugs are the two major checklist on 1st follow-up. Once blood pressure target is achieved, follow-up can be done at around 6 months interval.

At every follow-up, side effect of drugs must be enquired. The CVD risk factors and target organ damage may be reassessed at 2-years interval.

9. When patient is on two drugs, they can be given separately, one in the morning and one at night. When patient is on three or more drugs, they can be split in the morning and night according to convenience.

10. WHEN TO REFER A PATIENT WITH HYPERTENSION TO TERTIARY CARE CENTRE

1. Patients with comorbid diseases like diabetes mellitus, cardiovascular disease or chronic kidney disease
2. Patients with treatment-resistant hypertension, where even after three drugs on maximum tolerable doses blood pressure remains uncontrolled.
3. Patient in whom secondary hypertension is suspected.
4. Patients who need more detailed assessment for target organ damage from hypertension
5. Other situations where primary care giver feels more specified evaluation is required.

11. SUMMARY OF BP CONTROL

Clinical Condition(s)	BP Threshold, mm Hg	BP Goal, mm Hg
General		
Clinical CVD or 10-year ASCVD risk ≥10%	≥130/80	<130/80
No clinical CVD and 10-year ASCVD risk <10%	≥140/90	<130/80
Older persons (≥65 years of age; noninstitutionalized, ambulatory, community-living adults)	≥130 (SBP)	<130 (SBP)
Specific comorbidities		
Diabetes mellitus	≥130/80	<130/80
Chronic kidney disease	≥130/80	<130/80
Chronic kidney disease after renal transplantation	≥130/80	<130/80
Heart failure	≥130/80	<130/80
Stable ischemic heart disease	≥130/80	<130/80
Secondary stroke prevention	≥140/90	<130/80
Secondary stroke prevention (lacunar)	≥130/80	<130/80
Peripheral arterial disease	≥130/80	<130/80

ASCVD – Atherosclerotic Cardiovascular Disease, CVD - cardiovascular disease

All concerned are hereby informed.

Memo No. HFW-27024/50/2019-SPSRC SEC-Dept. of H&FW/1(6) /149 **Date.** 30/06/2025

Copy forwarded for information to: -

1. The Mission Director, (NHM), West Bengal
2. The Principal & MSVP, All Medical Colleges
3. The Addl. Mission Director, (NHM) West Bengal
4. The DDHS, Equipment & Store
5. CMHO, Kolkata Municipal Corporation
6. Coordinator, I.T cell, Swsathya Bhawan, for web posting
7. Office copy

Srabanjit Ghosh 30/6/25

Director of Medical Education
Govt. of West Bengal

30/6/25

Director of Health Services
Govt. of West Bengal