IHCI India Hypertension Control Initiative

Guide for Medical Officers

Cardiovascular diseases and hypertension burden in India

Cardiovascular diseases now contribute to **one-third** of the total **deaths** in India.

A large proportion of **cardiovascular events** (heart attacks and stroke) and **deaths** can be prevented if **high blood pressure** is detected and **treated** at an early stage.

High blood pressure in India

One in four of Indian adults has high BP

Out of them, only one in two know they have high blood pressure

Out of them, only one in ten have blood pressure under control

Government's efforts in controlling cardiovascular diseases and hypertension

The National Programme for prevention and control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) includes control of cardiovascular diseases (CVDs) and hypertension and has the following targets to be achieved by 2025.

- 25% reduction in the prevalence of high BP
- 25% reduction in mortality from CVD
- 30% reduction in mean population intake of salt

The **India Hypertension Control Initiative (IHCI),** a collaborative project between the MoHFW, State Governments, ICMR, and WHO India, focuses on strengthening hypertension management and monitoring at the primary health care level. By ensuring a continuum of care of patients detected with hypertension, IHCI complements the NPCDCS and is expected to accelerate the progress towards the achievement of NCD targets of the Government of India.

HEARTS

There are five steps needed to effectively control blood pressure

1. Implement practical treatment protocols

which are drug- and dose-specific and which establish steps to take if blood pressure is not controlled.
Use of standardized, evidence-based protocols reduces clinical variability, and results in more efficient and cost-effective selection of medications and treatment approaches.

2. Regular and uninterrupted supply of medications and equipment

to ensure that the right medications and equipment get to the right place at the right time, and reach the patients who need them.

3. Team-based care and task sharing

to involve nurses, health workers, and ASHAs for counseling and follow up of the patients and to improve adherence to treatment.

4. Patient-centred services

reduce barriers to care by increasing the convenience of medical visits and refills at Health & Wellness Centres and other primary health care facilities, and improving access to BP monitoring.

5. Information systems that allow continuous, real-time monitoring

to improve follow-up of patients whose blood pressure is not under control, measure program quality and coverage, and allow analysis of program data to improve patient care and system performance.

Role of the Medical Officer

- Ensure BP is measured for all adults visiting the out-patient department (OPD). Adults 30 years and above should be prioritised for screening.
- Treat all individuals with systolic BP ≥140 and/or diastolic BP ≥90 mmHg after confirmation
- Initiate treatment as per the State-endorsed standardized hypertension treatment protocol
- Follow up with the patient at 1-3 month intervals, and increase dose of medications or add another drug as and when required as per the State protocol
- Once target BP is achieved, refer patient to the nearest health and wellness centre (HWC)/sub-centre for continuation of treatment
- Ensure verification and timely submission of quarterly and annual reports (prepared by data entry operator/designated health staff)

Diagnosis of hypertension

Hypertension is known as the "silent killer" as the majority of patients with high BP are asymptomatic. The only way to know if BP is high is to measure it accurately.

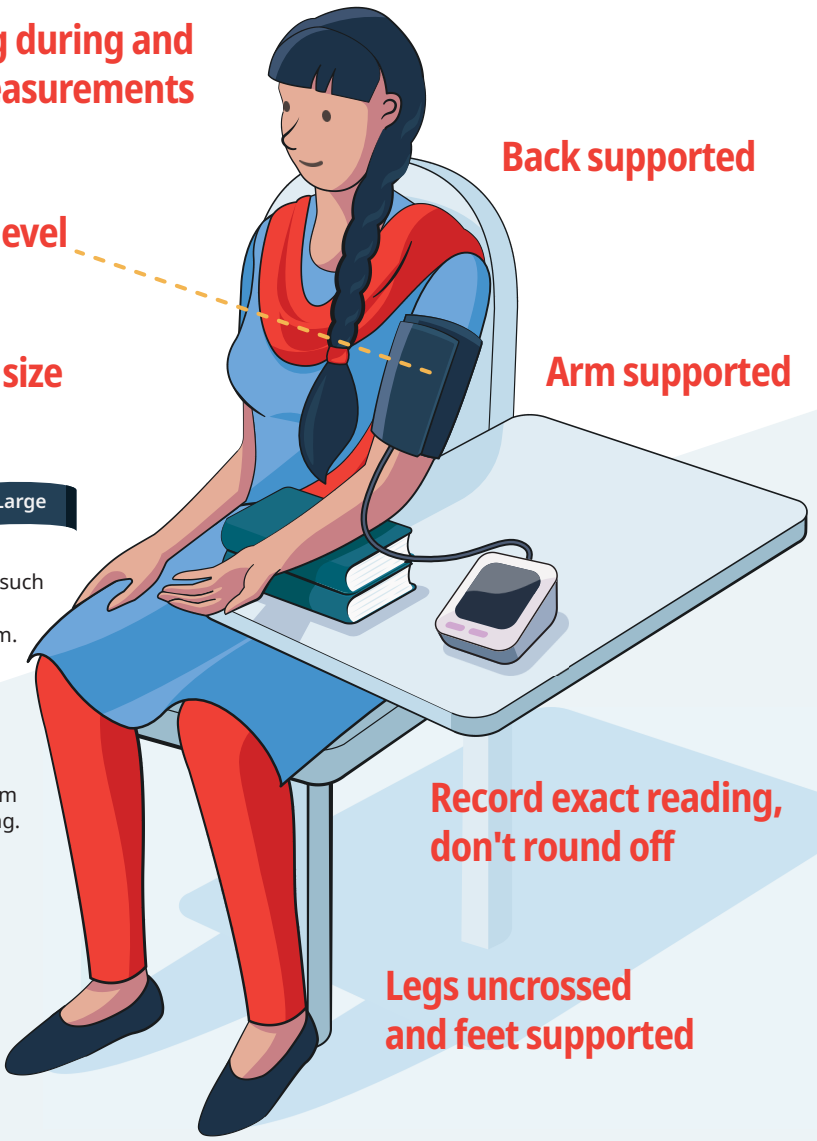
- Measure BP of all adults coming to the health facility. Adults 30 years and above should be prioritised.
- If available, use a validated professional-quality automated digital BP monitor.
- Use correct positioning while measuring BP.
- Treat all patients whose BP readings on two separate days are 140 or above for systolic or 90 or above for diastolic.
- Start treatment with medications on the same day if systolic BP is confirmed to be 160 or above or diastolic is confirmed to be 100 or above.

Common errors that cause variations in BP measurement

Error in Measurement	Variation in BP (mmHg)
Unsupported back/feet	6
Unsupported arm	10
Wrapping the cuff over clothing	5-50
Incorrect cuff size	2-10
Sitting with crossed legs	2-8
Talking	10
Full bladder	10

How to measure BP

Measure blood pressure of all adults ≥ 30 years



1. Use the correct cuff size such that the bladder encircles 80%–100% of the upper arm.

2. Cuff bladder width should be at least 40% of upper arm circumference.

3. Ensure cuff is on bare arm or over thin layer of clothing. Avoid bunching of clothes under cuff.

Ensure the person has not exercised, had tea/coffee, or used tobacco in the last 30 minutes
Person should rest comfortably and quietly for 5 minutes before the reading

Many guidelines recommend measuring multiple BPs at each visit, but this may not be realistic in a busy clinic setting. A practical approach for BP measurement:

- If BP <140/90 mmHg, no other BP measurement is needed during the visit.
- If BP ≥140/90 mmHg, perform a second BP measurement and use the second reading as the recorded BP for the encounter.
- If there is a large difference between the first and second BP readings (>5 mmHg), it is reasonable to do a third measurement and use the third BP as the recorded BP.

Measure blood pressure of all adults ≥30 years coming to the OPD

Hypertension diagnosis is established if the systolic BP≥140 mmHg and/or diastolic BP≥90 mmHg, on two different days.

However, if the BP is ≥160 mmHg or ≥100 mmHg at the first reading, second reading should be taken on the same day to establish the diagnosis.

DIGITAL BP MONITORS:

- When used correctly, automated, digital BP devices are highly reliable and preferable to manual BP devices, especially in busy clinics and when the measurement is done by non-physicians. Digital devices simplify the measurement process. They:
  - Eliminate errors related to hearing deficits, parallax, rapid inflation and deflation
  - Enable multiple measurements to be taken sequentially
  - Eliminate the subjectivity of measurement by reducing observer errors and terminal digit preference
- There is a general mistrust of digital BP devices among health professionals. This is because most BP devices available in the market are not validated and do not meet the prescribed global standards. Automated BP devices that have passed at least one of these global standards and been tested by an independent authority have been proven to be accurate.
- Many devices available in the market are for home use and not for office use where BP is measured for a larger number of persons. Therefore, for health facilities, professional models are recommended.

Hypertension Treatment

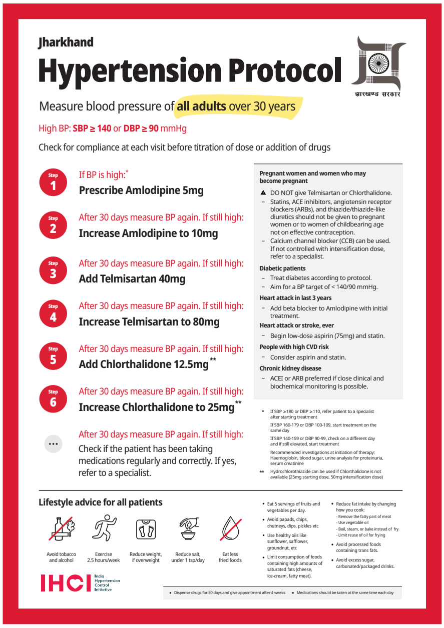
The State hypertension treatment protocol is based on global guidelines and has been finalized after consultations with National and State-level experts and is endorsed by the State government.

Early treatment and control of high BP is essential to prevent target organ damage. Treatment should be initiated even if the patient is asymptomatic; in fact, most patients will not present any symptoms. Upon diagnosing hypertension, the Medical Officer should initiate treatment and advise patients for monthly follow ups. At each monthly follow up, clinic staff should measure BP and, if BP is not under control (<140/90), the Medical Officer should escalate to the next step in the protocol, i.e. increasing the dose of the initial drug or adding a new drug as per the protocol. Once target BP (<140/90) is achieved at any step, the patient should be referred to the nearest health and wellness centre/ sub-centre for continuation of treatment.

At the sub-centre, the Auxillary Nurse Midwife (ANM) will measure BP at each monthly visit. If less than 140/90, the ANM will give the patient medicines as prescribed by the Medical Officer. If BP is 140/90 or above during any visit, the ANM will refer the patient back to Medical Officer.

Counseling for lifestyle management and treatment adherence should be reinforced at each visit.

Example of State hypertension treatment protocol



Jharkhand

Hypertension Protocol

झारखण्ड सरकार

Measure blood pressure of **all adults** over 30 years

High BP: **SBP ≥ 140** or **DBP ≥ 90** mmHg

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

Step 1 — If BP is high:*
Prescribe Amlodipine 5mg

Step 2 — After 30 days measure BP again. If still high:
Increase Amlodipine to 10mg

Step 3 — After 30 days measure BP again. If still high:
Add Telmisartan 40mg

Step 4 — After 30 days measure BP again. If still high:
Increase Telmisartan to 80mg

Step 5 — After 30 days measure BP again. If still high:
Add Chlorthalidone 12.5mg**

Step 6 — After 30 days measure BP again. If still high:
Increase Chlorthalidone to 25mg**

... — After 30 days measure BP again. If still high:
Check if the patient has been taking medications regularly and correctly. If yes, refer to a specialist.

Pregnant women and women who may become pregnant
- DO NOT give Telmisartan or Chlorthalidone.
- Statins, ACE inhibitors, angiotensin receptor blockers (ARBs), and thiazide/thiazide-like diuretics should not be given to pregnant women or to women of childbearing age not on effective contraception.
- Calcium channel blocker (CCB) can be used. If not controlled with intensification dose, refer to a specialist.

Diabetic patients
- Treat diabetes according to protocol.
- Aim for a BP target of < 140/90 mmHg.

Heart attack in last 3 years
- Add beta blocker to Amlodipine with initial treatment.

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

People with high CVD risk
- Consider aspirin and statin.

Chronic kidney disease
- ACEI or ARB preferred if close clinical and biochemical monitoring is possible.

* If SBP ≥180 or DBP ≥110, refer patient to a specialist after starting treatment
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 day and if still elevated, start treatment
Recommended investigations at initiation of therapy: Haemoglobin, blood sugar, urine analysis for proteinuria, serum creatinine

** Hydrochlorothiazide can be used if Chlorthalidone is not available (25mg starting dose, 50mg intensification dose)

Lifestyle advice for all patients

Avoid tobacco and alcohol | Exercise 2.5 hours/week | Reduce weight, if overweight | Reduce salt, under 1 tsp/day | Eat less fried foods

- Eat 5 servings of fruits and vegetables per day.
- Avoid papads, chips, chutneys, dips, pickles etc
- Use healthy oils like sunflower, safflower, groundnut, etc
- Limit consumption of foods containing high amounts of saturated fats (cheese, ice-cream, fatty meat).
- 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 excess sugar, carbonated/packaged drinks.

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- Dispense drugs for 30 days and give appointment after 4 weeks
- Medications should be taken at the same time each day

The treatment goal is

Systolic BP < 140 mmHg

AND

Diastolic BP < 90 mmHg

If blood pressure is elevated, escalate medications as per hypertension protocol

MEDICATIONS USED IN THE STANDARD HYPERTENSION TREATMENT PROTOCOLS

Class (Drugs)	Important notes
Calcium channel blocker (Amlodipine)	• Does not require any metabolic monitoring. Therefore, a good first choice forprimary health centers • Can be given to women of childbearing age who may become pregnant • Ankle oedema ~10% cases (particularly at 10 mg dose and absence of ACEI/ ARB)
Angiotensin receptor blocker (ARB) [Telimisartan/Losartan]	• **Should not be given to women who are or may become pregnant** • Benefits some patients with kidney disease, prior heart attack, and low ejection fraction • Addition of ARB to CCB reduces the incidence of ankle oedema • ARB and ACB-I should not be combined together • Risk of hyperkalemia especially if the patient has CKD – consider checking serum creatinine and potassium before initiating treatment and thereafter at least once a year
Angiotensin-converting enzyme (ACE) inhibitor [Enalapril]	• **Should not be given to women who are or may become pregnant** • Benefits some patients with kidney disease, prior heart attack, and low ejection fraction • Addition of ACE inhibitors to CCB reduces the incidence of ankle oedema • ARB and ACB-I should not be combined together • Can cause persistent cough ~ 10% cases • Risk of hyperkalemia especially if the patient has CKD – consider checking serum creatinine and potassium before initiating treatment and thereafter at least once a year
Thiazide or thiazide-like diuretics [Hydrochlorothiazide, Chlorthalidone]	• **Should not be given to women who are or may become pregnant** • Risk of hypokalemia – consider checking serum creatinine and potassium before initiating treatment and thereafter at least once a year • Using along with ACE Inhibitor/ARB will reduce the risk of hypokalemia

SPECIFIC CASES:

Beta blocker: patients with history of heart attack within last three years or atrial fibrillation or heart failure. Not the first choice drug for the treatment of hypertension

Low dose aspirin (75mg) for patients with history of heart attack or stroke ever

Statins: Atorvastatin 10mg is recommended in patients with prior CVD. Should not be given to women who are or may become pregnant.

Treatment Inertia

not under control. The potential reasons and solutions are provided below.

A. The Medical Officer may not notice the high BP recording due to busy, crowded clinics

- A nurse or other staff may highlight the raised BP reading for the doctor (using colour pen/highlighter or symbol)

B. BP readings are *borderline high*

- Anti-hypertensive medication should be escalated to the next step in the protocol if SBP is equal to or slightly higher than 140 mmHg or diastolic BP is equal to or slightly higher than 90 mmHg. Evidence suggests that cardiovascular risk increases with every mmHg rise in BP beyond SBP 115 mmHg and DBP 75 mmHg.

C. The doctor suspects that the patient might have missed medications

- "Doctor, I usually take my BP medicine every day—but I didn't today!" When a patient reports missing medication, the only solution is to instruct the patient to take their medications and repeat the BP measurement while on the medication, for example, one week later. Health care workers should not guess what the treated BP would be, as individual patients respond differently to antihypertensive medications.

D. A patient might have reported adverse effects

- Change medications to a different class

It can be difficult for a clinician to make a decision with one high BP reading. A well-maintained record (paper/electronic) with multiple BP readings can help the clinician understand the trend of blood pressure and make an informed decision.

Counselling on Medication Adherence

To keep BP at a safe and healthy level, patients must take daily medication for the rest of their lives. Patients can be reluctant to commit to taking medication every day and struggle to take medication regularly for a disease with no symptoms and may worry about side effects of the drugs. Medical Officers can help patients understand the risks of high BP, and the importance of taking medications consistently.

A Medical Officer can help to increase a patient's compliance with treatment by:

- Good patient-health care provider relationship;
- Positive feedback: praise adherence through positive feedback and encouragement.

Medical Officers should work with other members of the health care team to implement patient reminder systems (e.g., e-mail, phone calls, text messages), where possible, to ensure patients adhere to their medication regimen.

Important: Check the patient's understanding before the patient leaves the health centre

COUNSELLING TO PATIENTS SHOULD STRESS THE FOLLOWING POINTS:

- High BP is very dangerous. Even though a patient does not feel sick, high BP can harm the organs and cause heart attack, stroke, kidney disease, and death.
- Patients can control high BP and protect themselves from heart attack and stroke by regularly taking medication and returning to the clinic for follow-ups.
- Taking medication regularly is the most important thing a patient can do to control high BP. Even if the patient feels fine, they should NEVER stop a medication without consulting a doctor. There is a difference between medicines for long-term control (as in hypertension) and medicines for quick relief (such as for headaches). Taking the proper dose of BP medication at the same time each day can save the patient's life.
- Medication should be consumed at the same time every day - when the patient can remember. Encourage patients to use medication reminders, such as alarms and smartphone applications.
- It is important to keep a large enough supply of medications at home till the next visit to the health facility.
- Depending on the medications prescribed, describe potential adverse effects and how to deal with them

Lifestyle management advice

Lifestyle changes are important, but **they are not enough to control high BP.** Some lifestyle changes can help patients with high BP when undertaken along with medication.

Avoid tobacco and alcohol

Reduce salt under 1 tsp/day

Eat 4-5 servings of fruits & vegetables

Exercise 2.5 hours every week

Frequently Asked Questions

Q. Is it better to take antihypertensive medications in the morning or evening?

It is important to take medication at the same time every day! In general, patients should make taking medications part of their daily routine, whenever they are mostly likely to remember it. Some programs recommend taking medicine after brushing teeth in the morning, but there is insufficient evidence to suggest that taking medicine at any particular time of day is better – other than at the time when patient is most likely to remember it.

Q. How should medications be managed when the patient has lower than normal BP?

If the systolic BP is below 110 mmHg:
For asymptomatic patients, discontinue one medication (usually the last medication prescribed)

If systolic BP is below 90mmHg and asymptomatic:

- Stop all antihypertensive drugs until BP is re-assessed (ideally within the next 7 days).
- Evaluate the causes of low BP: side effects from other medications, dehydration, acute inflammatory conditions, or measurement error.
- Ask the patient to return for repeat BP measurement

If systolic BP is below 90mmHg and symptomatic:
Significant symptomatic reductions in BP require immediate individualized assessment and management.

Q. How should a patient who is already on non-protocol drugs be treated?

If a patient is on non-protocol drugs, and

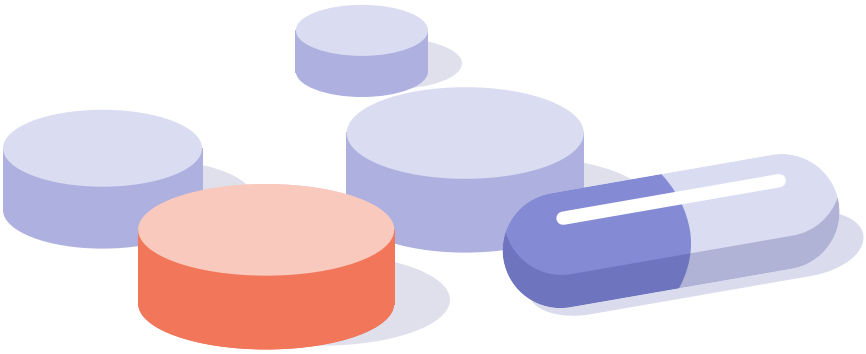
- BP is <140/90: continue to use the same medication(s).
- BP is ≥ 140/90: move to/add on protocol medicines.
- Non-protocol drug is not available at facilities: replace with protocol medicines.

Please note that beta blockers should not be stopped suddenly. A sudden withdrawal of beta blockers may exaggerate symptoms of coronary artery disease. Therefore, it is recommended that the beta blocker should be tapered over 5-10 days.

e.g. For a patient currently taking Atenolol 50 mg 1 tab daily, prescribe Atenolol 50 mg ½ tab daily along with amlodipine 5 mg once daily. After one week, stop Atenolol and continue Amlodipine.

Q. If a protocol medication is not available, can another medication from the same drug class be substituted? *(E.g. Substitute Telmisartan by Losartan or Chlorthalidone by Hydrochlorothiazide)*

Absolutely. In general, all antihypertensive medications lower blood pressure effectively. Equivalent doses of the alternative drugs may be used.



Q. How should amlodipine-induced ankle oedema be managed?

When not troublesome to the patient, mild oedema does not require specific treatment. Though ankle oedema associated with amlodipine is rarely clinically serious, it may significantly reduce patient adherence. It is usually refractory to diuretic treatment as it is due to changes in capillary pressure leading to leakage into surrounding tissues, rather than due to water retention. Treatment strategies include:

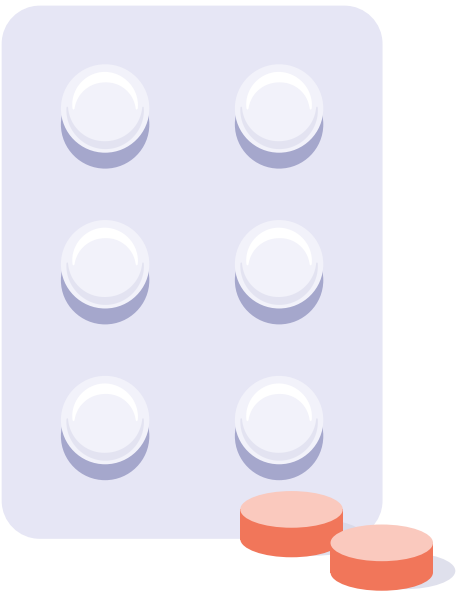
- Non-pharmacological interventions: Elevation of legs, or graduated compression stockings.
- Reduce dose: For example, if on 10mg amlodipine, reduce the dose to 5mg.
- Add ACEI or ARB: Addition of an ACEI or ARB to amlodipine usually reduces the incidence of ankle oedema.
- If the above three options fail, discontinue amlodipine and switch to an antihypertensive from another class of drugs.

Drug Stock Management at Health Facilities

Drug stock goals at a health care facility: At any point in time, the health care facility should have 2-3 months drug stocks to ensure uninterrupted supply.

Facilities should avoid having less than one-month stock of any protocol drug at any time

Note: The stock levels are expressed as 'months of stock' which indicates how long the drugs will last. For example - 2-months stock means the stock will last for another two months.



Inventory management at the health facility level: Maintaining optimal levels of drugs at the health facility ensures continuity of treatment to all patients and reduces wastages.

- A typical health facility that receives a once a month supply should maintain 2-3 months stock.
- At the beginning of the program, ensure a 3-month stock.
- To calculate indent, subtract the current stock from the 3-month stock requirement (if drug supply is monthly).

Dispensing of drugs: Medications should be prescribed and dispensed for at least 30 days. Dispensing should be done with a clear message on the importance of regular medication and the consequences of non-adherence.

Maintenance of records: Health facilities should maintain records of receipt and issue of all drug stocks, irrespective of the source, preferably in a single stock ledger. Health facilities should regularly update the records and report the actual status in the quarterly/monthly reports.

Team-based Care and Task Sharing

Certain functions or skills can be shifted from Medical Officers to other health staff, such as staff nurses, supervisors, pharmacists, etc. This allows the program to reach more patients, and allowes Medical Officers to focus on complicated cases.

These include:

- History taking
- BP measurement
- Continuing medication to those patients with controlled BP
- Providing counselling on the risks of high BP, medication adherence and lifestyle management

For task sharing to be successful, it is important to streamline patient flow at the health facilities.

SUGGESTED PATIENT FLOW IN HEALTH FACILITIES

BP not under control

Doctor - Diagnoses, prescribes drugs

BP under control

Nurse - Refills medications, updates treatment card, counsels

Pharmacist - Dispenses drugs, Reinforces treatment adherence

Leave the Card with the Pharmacist

Patient-centred Services

A patient-centred approach prioritizes care that considers the patient's needs, values, and preferences, and ensures accessibility of quality services. Elements of patient-centred care include easy-to-take medicine regimens, free or low-cost medications and follow- up visits, and readily available blood pressure monitoring.

Decentralizing hypertension services to make them available at the sub-centre/health and wellness centre (HWC) level is key to patient-centred care.

Sub-centre /ANM	Home visits by ASHAs
Accessible place for BP measurement	Increased awareness of importance of BP control
Lower cost	Convenient medical visits for medication refills
Mobile medical units	HWCs /MLHPs

PATIENT FLOW IN HWCs/SUBCENTRES

Patient comes to HWC/Sub-centre for continuation of treatment

ANM measures BP and asks for any complaints

BP not under control

- Refers patient to Medical Officer
- Enters details in treatment card

BP under control

- Refills medications
- Reinforces treatment adherence
- Enters details in treatment card
- Gives date for next visit

Information Systems

MONITORING

There are two core monitoring indicators under IHCI:

QUARTERLY INDICATOR:

Percentage of patients starting treatment during a quarter (cohort) who achieve BP control (<140/90) 3-6 months after the start of treatment

- Tracer indicator for the quality of the program
- Measure of the effectiveness of treatment among patients
- Helps identify health facilities with lower performance and support them early with the required interventions
- Indicator can be measured for each treating health facility once every quarter

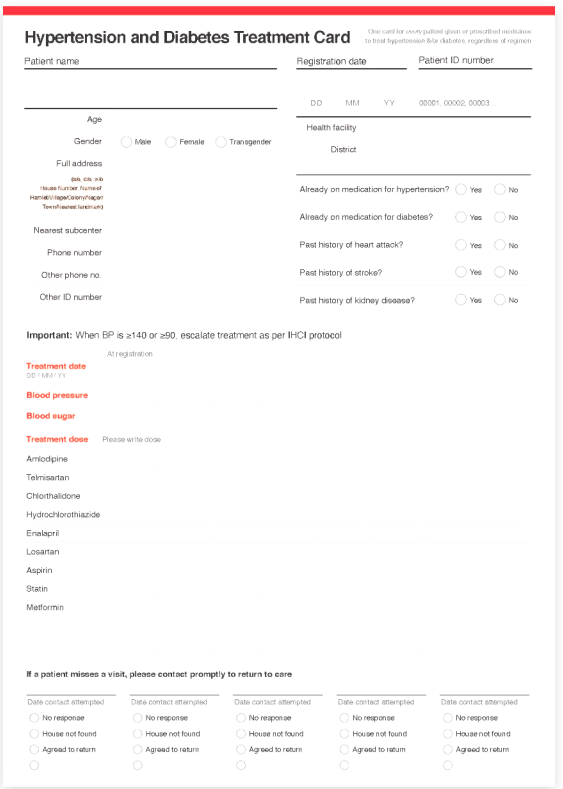
ANNUAL INDICATOR:

Percentage of estimated patients with hypertension who have controlled BP in defined geographical area

- Indicator of impact: coverage and quality of the programme
- Estimates coverage of patients with controlled hypertension in an area
- The aim is to increase the number of people with controlled BP
- Measured for a district or a State
- The denominator is derived from the estimated hypertension prevalence for a District/State

RECORDING AND REPORTING TOOLS

In facilities not using digital systems/Simple app, a **hypertension treatment card** is issued to all patients who are newly diagnosed with hypertension and starting treatment, or who are already on treatment for hypertension and wish to continue treatment at the health facility. Hypertension treatment card will initially be filled at the health facility. Medical Officers will write the initial medicines and subsequent changes in prescription. Nurses should update the card during follow-up visits.



Hypertension and Diabetes Treatment Card

One card for every patient given or prescribed medicines to treat hypertension &/or diabetes, regardless of regimen

Patient name | Registration date | Patient ID number

DD MM YY 00001, 00002, 00003...

Age

Gender ○ Male ○ Female ○ Transgender

Full address

(pin, city, sub House number, Name of Hamlet/Village/Colony/Nagar/ Town/Nearest landmark)

Health facility

District

Nearest subcenter

Phone number

Other phone no.

Other ID number

Already on medication for hypertension? ○ Yes ○ No

Already on medication for diabetes? ○ Yes ○ No

Past history of heart attack? ○ Yes ○ No

Past history of stroke? ○ Yes ○ No

Past history of kidney disease? ○ Yes ○ No

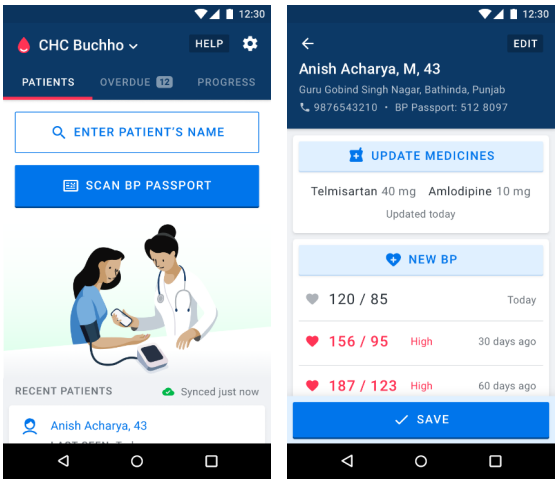
Important: When BP is ≥140 or ≥90, escalate treatment as per IHCI protocol

	At registration				
Treatment date DD / MM / YY					
Blood pressure					
Blood sugar					
Treatment dose	Please write dose				
Amlodipine					
Telmisartan					
Chlorthalidone					
Hydrochlorothiazide					
Enalapril					
Losartan					
Aspirin					
Statin					
Metformin					

If a patient misses a visit, please contact promptly to return to care

Date contact attempted	Date contact attempted	Date contact attempted	Date contact attempted	Date contact attempted
○ No response	○ No response	○ No response	○ No response	○ No response
○ House not found	○ House not found	○ House not found	○ House not found	○ House not found
○ Agreed to return	○ Agreed to return	○ Agreed to return	○ Agreed to return	○ Agreed to return
○	○	○	○	○

Mobile apps including **Simple** can help health workers keep track of patients' BP measurements and medications.



Patient BP Passport is issued to each patient registered for treatment. Basic patient details are recorded, and the patient is advised to bring the BP passport during follow-up visits. The unique patient number/QR code can be used for faster retrieval of hypertension treatment card/patient information from Simple app. *(See the Simple SOP Manual for detailed information)*

Facility hypertension register has a line listing of all patients on treatment and is maintained at the health facility. In facilities using paper systems, the data from the register can be used to obtain the proportion of patients who are on regular treatment and have BP under control. This will help in assessing the quality of services and the impact of the IHCI.