

Multisociety Jordan National Hypertension Clinical Protocols

Initiative

A Collaborative Program of Nine Jordanian Medical Societies Coordinated by the Jordan Cardiac Society (JCS)

Participating Societies:

- Jordan Cardiac Society (JCS)
- Jordan Atherosclerosis Society (JAS)
- Jordan Society of General Practitioners (JSGP)
- Jordan Society of Internal Medicine (JSIM)
- Jordan Society of Nephrology (JSN)
- Jordan Society of Family Medicine (JSFM)
- Jordan Emergency Medicine Society (JEMS)
- Jordan Endocrine and Diabetes Society (JEDS)
- Jordan Nutrition Society (JNS)

Based on:

ESH/ESC 2024

ACC/AHA 2025 and CCS Updates, and

International Society of Hypertension 2020

Preface :

Each population requires its most suitable guideline, and the best blood pressure categorization ...

(In Jordan, many patients are inherently high risk due to prevalent cardiovascular factors, yet awareness and access to consistent treatment remain limited. Therefore, blood pressure categorization and treatment strategies must balance scientific evidence with local realities.)

1. Diagnosis Protocol

Hypertension is diagnosed when:

* Office blood pressure $\geq 140/90$ mmHg , Confirmed on at least two separate visits (This corresponds approximately to home BP $\geq 135/85$ mmHg)

OR on

* Home blood pressure $\geq 135/85$ mmHg

OR on

* 24-hour ambulatory blood pressure monitoring $\geq 130/80$ mmHg

Except If BP severe or there is target-organ damage, hypertension may be diagnosed immediately in one visit and treated without waiting for repeated visits.

* Office $\geq 140/90$ with home $< 135/85$ \rightarrow suggests white-coat hypertension “WCH” (elevated office BP $\geq 140/90$ with normal home BP $< 135/85$).

* WCH Occurs in about 15–30% of patients with high office readings.

- * Important to avoid misdiagnosis and unnecessary treatment.
- * Cardiovascular risk is higher than normal BP but lower than sustained hypertension.
- * About 30–40% may progress to true hypertension over time.

Accurate measurement is essential:

- * Use validated upper-arm automated devices
- * Avoid cuffless devices
- * Ensure correct cuff size
- * Confirm diagnosis with home or ambulatory monitoring whenever possible

Hypertension Screening (Adults and Children)

- * Adults: Screen all adults ≥ 18 years during routine clinical visits.
- * Normal BP: recheck every 3 years; elevated BP: reassess annually or sooner.
- * High-risk adults (diabetes, CKD, obesity, family history): screen more frequently.
- * Children and adolescents: begin BP screening from age 3 years, once yearly.
- * High-risk children (obesity, kidney disease, diabetes, congenital heart disease): measure BP at every visit.

When to Suspect Secondary Hypertension:

- * Resistant hypertension despite ≥ 3 medications
- * Onset of hypertension before age 40
- * Abrupt onset or sudden worsening of previously controlled hypertension
- * Hypokalemia
- * Worsening in renal function
- * Asymmetric kidney size
- * Persistent diastolic hypertension after age >55 years
- * Disproportionate target-organ damage for the level of BP
- * Non-Dipping Nocturnal Blood Pressure

Most Common Causes of Secondary Hypertension

(Approximate clinical frequency)

Common

- * Primary aldosteronism
 - $\approx 5\text{--}10\%$ of all hypertension
 - $\approx 15\text{--}25\%$ of resistant hypertension
- * Obstructive sleep apnea
 - $\approx 5\text{--}10\%$

* Chronic kidney disease (renal parenchymal disease)

≈ 3–5%

Less common :

* Renal artery stenosis

≈ 1–5%(Unilateral stenosis → usually hypertension only.

Bilateral stenosis → hypertension + renal failure risk)

* Thyroid disorders

≈ 1–2%

Rare

* Pheochromocytoma / paraganglioma

≈ 0.1–0.6%

* Cushing syndrome

< 1%

* Hyperparathyroidism

< 1%

* Coarctation of the aorta

< 0.1%

Key Clinical Message

* Secondary hypertension accounts for about 5–10% of all hypertension.

* Approximately 90–95% of patients have primary (essential) hypertension.

Initial Evaluation for Suspected Secondary Hypertension

Basic tests for all patients

* Serum creatinine and eGFR

* Serum electrolytes (especially potassium)

* Urinalysis \pm urine albumin/creatinine ratio

* Fasting glucose or HbA1c

* Lipid profile

Screening for common secondary causes

- * Aldosterone–Renin Ratio (ARR) → screen for primary aldosteronism
- * Sleep study when obstructive sleep apnea is suspected
- * TSH → screen for thyroid disorders

Renal evaluation

- * Renal ultrasound (kidney size and asymmetry)
- * Renal artery imaging (CT angiography / MR angiography / Doppler) when renal artery stenosis is suspected

Endocrine evaluation when clinically suspected(Plasma free metanephrines → pheochromocytoma)

Important principle

- * Testing should be guided by clinical suspicion, not performed routinely in all patients with hypertension.

2. Cardiovascular Risk Assessment Protocol

Every patient must undergo cardiovascular risk assessment.

You can use one formal calculator:

* PREVENT or /ASCVD (American model)

OR

* SCORE2 or SCORE2-OP (European model)

You can also estimate CV risk for the patient clinically. Do not wait for a calculator when risk is clinically obvious:

Automatically treat as High Risk if the patient has:

* Established atherosclerotic vascular disease

* Diabetes

* Chronic kidney disease (estimated glomerular filtration rate <60 or albuminuria)

* Target organ damage

* Multiple major cardiovascular risk factors

Or 2 major risk factors of the following :

* Hypertension

* Smoking

* Diabetes

* Dyslipidemia

* Family history of premature vascular disease

3. When to Start Medication

Start immediately if:

- * Blood pressure $\geq 160/100$ mmHg

Start at:

- * $\geq 140/90$ mmHg

Start earlier ($\geq 130/80$ mmHg) if High Risk:

- * Diabetes
- * Chronic kidney disease
- * Established vascular disease
- * High calculated cardiovascular risk
- * Multiple major risk factors

Lifestyle treatment is mandatory for all patients.

4. Treatment Targets

General target for low risk patients:

- * $< 140/90$ mmHg

(Preferred target if tolerated:

- * $< 130/80$ mmHg)

High-risk patients:

- * Actively aim for <130/80 mmHg

Elderly or frail:

- * Individualize
- * Avoid systolic blood pressure <120 mmHg unless well tolerated

Safety always comes first.

5. Drug Therapy Protocol**Stage 1 (140–159/90–99):**

- * Monotherapy acceptable
- * Low-dose single-pill combination encouraged

Stage 2 (\geq 160/100) or stage 3 180/110 :

- * Start dual or triple low dose immediately

Preferred first-line classes:

- * Angiotensin-converting enzyme inhibitor OR angiotensin receptor blocker
- * Long-acting calcium channel blocker
- * Thiazide or thiazide-like diuretic (chlorthalidone or indapamide preferred)

Use single-pill combinations whenever possible.

6. Resistant Hypertension Protocol

Definition:

* Blood pressure $\geq 140/90$ mmHg despite three drugs including a diuretic

OR

* Controlled blood pressure requiring four or more drugs

Step 1 – Confirm true resistance:

* Assess medication adherence

* Evaluate for secondary hypertension

Step 2 – Review contributing factors:

* Excess sodium intake

* Obesity

* Alcohol excess

* Nonsteroidal anti-inflammatory drugs

* Hormonal therapy

* Steroids

* Obstructive sleep apnea

Step 3 – Optimize regimen:

Ensure combination includes:

- * Renin-angiotensin system blocker
- * Long-acting calcium channel blocker
- * Thiazide or Thiazide-like (Indapamide) diuretic

If severe renal impairment is present, consider loop diuretic:

(When eGFR <30:

- Thiazide / thiazide-like diuretics lose effectiveness
- Loop diuretics become preferred)

Step 4 – Add-On Therapy (If 4 Drugs Are Needed)

- * Spironolactone — first-line add-on therapy if serum K <5 mmol/L and renal function permits
- * Beta-blocker may be considered particularly when:
 - Coronary artery disease
 - Heart failure
 - Atrial fibrillation or tachyarrhythmia
 - High sympathetic tone / tachycardia

Step 5 – Evaluate secondary causes systematically.

Step 6 Hypertensive Crisis Protocol

Severe Asymptomatic Hypertension(Urgency older term): Evaluation and Treatment

- By definition, there is no acute target-organ injury

Evaluation

- Perform history and physical examination to distinguish severe asymptomatic hypertension from hypertensive emergency

- Focus on:

- medication adherence as if severe BP elevation occurs due to medication nonadherence, restarting the patient's usual antihypertensive therapy may be all that is required.

- Look for signs of target-organ damage:

- neurologic deficits

- papilledema

- pulmonary edema

- arrhythmia

- unequal pulses

- renal dysfunction

- Look for signs of target-organ damage:
- neurologic deficits
- papilledema
- pulmonary edema
- arrhythmia
- unequal pulses(Aortic dissection)
- renal dysfunction

Blood Pressure Measurement

- Measure in both arms initially
- Use the higher reading

Importance of Rest

- A 30-minute rest period is recommended when BP is severely elevated
- In more than 30% of patients, BP falls to an acceptable level without intervention after rest

Preferred Oral Agents for Severe Asymptomatic Hypertension-Urgency cases:

* Captopril — onset 15–30 min (rapid BP reduction; commonly used in ED).

* Nifedipine ER (extended-release) — onset 30–60 min (avoid short-acting nifedipine; exception: in pregnancy it may be used orally (swallowed) in severe, not SL).

* Prazosin — onset 1–2 h (use cautiously due to risk of first-dose orthostatic hypotension; start with a low initial dose and monitor blood pressure).

* Amlodipine — onset 4–6 h (preferred at discharge for longer BP control).

In Hypertensive Emergency

Management principles

- Admit to ICU / monitored unit
- Use IV antihypertensives
- Reduce MAP by 20–25% in the first hour
- Then reach 160/100–110 mmHg within 2–6 hours
- Normalize BP gradually over 24–48 h

* If IV nitroglycerin is the only available agent, it can be used for hypertensive emergency but is not ideal for all situations.

Best indications:

* Acute pulmonary edema

* Acute coronary syndrome

Not preferred for:

- * Stroke or ICH → (Nicardipine or Labetalol preferred)
- * Hypertensive encephalopathy → (Nicardipine or Labetalol preferred)
- * Aortic dissection → (Beta-blocker first: Esmolol or Labetalol; Nitroprusside may be added if BP remains uncontrolled)

Dose:

- * Start 5 mcg/min IV infusion
- * Titrate every 5 minutes

Goal:

- * Reduce BP 20–25% (to ~160/100) in the first hour, then gradually.
- * IV Hydralazine: direct arterial vasodilator.
- * Mainly used in hypertensive emergencies of pregnancy (preeclampsia/eclampsia).
- * Dose: 5–10 mg IV bolus, repeat every 20–30 min if needed.
- * Limitations: unpredictable BP drop and reflex tachycardia; therefore not first-line in most hypertensive emergencies.

General Rule (ESH-Aligned)

- Reduce mean arterial pressure (MAP) by no more than 20–25% within the first hour.
- Avoid rapid or excessive reduction to prevent cerebral, coronary, or renal ischemia.

Exceptions – Condition-Specific Targets

* Aortic Dissection

- Immediate reduction of systolic BP to <120 mmHg within 20 minutes
- Control heart rate to <60 bpm
- Initiate beta-blocker before vasodilator when possible

* Acute Ischemic Stroke (No Thrombolysis)

- Do not lower BP unless >220/120 mmHg
- If treatment is required, reduce cautiously:
 - ≤15% during the first 24 hours

Blood Pressure Control Before Thrombolysis (Acute Ischemic Stroke)

Eligibility for thrombolysis requires:

- * BP <185/110 mmHg before thrombolytic therapy

If BP is above this level:

Lower blood pressure cautiously using short-acting IV agents:

* Labetalol

- 10–20 mg IV over 1–2 minutes
- May repeat once

* Nicardipine infusion

- Start 5 mg/h IV
- Increase by 2.5 mg/h every 5–15 min
- Maximum 15 mg/h

* Clevidipine infusion (where available)

After thrombolysis

* Maintain BP <180/105 mmHg for the first 24 hours

Important principle

- * BP reduction should be controlled and modest
- * Avoid rapid or excessive lowering to prevent cerebral hypoperfusion
- * Intracerebral Hemorrhage (ICH)
 - Target systolic BP \approx 140 mmHg
 - Achieve reduction within the first 6 hour

- If stable, then you further reduce blood pressure more slowly to approximately 160/100–110 mmHg over the next 2–6 hours.
- Gradual normalization may then occur over the following 24–48 hours.

The presence of organ damage defines the emergency, not the number alone.

7. Hypertension in pregnancy:

SBP \geq 140 mmHg or DBP \geq 90 mmHg.

- Gestational hypertension: occurs after 20 weeks with previously normal BP.
- Chronic hypertension: present before pregnancy or before 20 weeks.
- Most international guidelines (ESC, NICE, WHO, Canada):
 - Start treatment at \geq 140/90 mmHg.
 - Target often $<$ 140/90 mmHg

Preeclampsia diagnosis(Emergency case) :

- BP \geq 140/90 mmHg after 20 weeks
- Plus proteinuria or organ dysfunction, including:
 - renal impairment
 - liver dysfunction
 - thrombocytopenia

- neurological symptoms

Most international guidelines consider the following agents as preferred options:

- Labetalol
- Methyldopa
- Nifedipine

Additional option (especially in acute severe hypertension):

- Hydralazine (IV), particularly for acute BP control in severe hypertension during pregnancy.

Oral hydralazine is not contraindicated, but it is not preferred because safer and more predictable agents are available for maintenance therapy in pregnancy.

Medications to avoid

- Renin–angiotensin system blockers
- ACE inhibitors
- ARBs
- direct renin inhibitors

Acute Severe Hypertension in Pregnancy

(for Multisociety Hypertension Protocol)

Multidisciplinary team :

- obstetricians
 - cardiologists
 - nephrologists
 - nurses and midwives

Definition

- Severe hypertension:

SBP \geq 160 mmHg or DBP \geq 110 mmHg

- Requires urgent treatment within 30–60 minutes to reduce risk of:
 - maternal stroke
 - placental abruption
 - fetal compromise

First-Line Drug Treatment for acute severe hypertension in pregnancy :

Immediate-Release Oral Nifedipine

- Dose: 10–20 mg orally (swallowed)
- Do NOT give sublingually

- Repeat after 20 minutes if BP remains $\geq 160/110$
- Maximum: 30 mg in the first hour
- Onset: ~5–10 minutes

Role

- One of the first-line therapies for acute severe hypertension in pregnancy
- Particularly useful when IV access is not available or delayed

Alternative First-Line Options

- IV Labetalol
- IV Hydralazine

All three agents are recommended by major obstetric guidelines.

Important Administration Note

- Immediate-release nifedipine must be given orally (swallowed “not” SL).
- Sublingual administration is not recommended because it may cause rapid hypotension and maternal–fetal complications.

Key Clinical Principle

- Immediate-release nifedipine is accepted in obstetrics for acute severe hypertension.
- It is generally avoided in other hypertensive emergencies because of the risk of uncontrolled BP reduction.

Reference

ACOG Committee Opinion No. 692 – Referenced by: ACC / AHA cardiovascular reviews .

Emergent Therapy for Acute-Onset Severe Hypertension in Pregnancy

<https://www.ncbi.nlm.nih.gov/books/NBK537052/CV>

8. Lifestyle Protocol

All patients:

- * Reduce sodium intake
- * Increase dietary potassium if safe
- * Maintain healthy weight
- * Exercise regularly
- * Stop smoking
- * Limit alcohol

Potassium-enriched salt may be considered in patients without hyperkalemia risk.

9. Nocturnal Hypertension Protocol

- * Diagnosed only by ambulatory monitoring
- * Associated with higher cardiovascular and renal risk
- * Consider evening dosing
- * Treat sleep apnea when present
- * Avoid excessive lowering in elderly (<110/65)

Final Position – JCS 2026

This document:

- * Applies European diagnostic standards
- * Integrates 2025 American updates
- * Intensifies treatment in high-risk patients
- * Emphasizes structured risk assessment
- * Promotes single-pill strategy
- * Incorporates maternal and stroke safety protocols
- * Provides structured evaluation for resistant hypertension

Core Messages

Diagnose accurately.

Assess cardiovascular risk in every patient.

Treat earlier in high-risk individuals.

Aim safely for below 130/80 when appropriate.