

Managing Emergency Hypertension: A Critical Guide for Healthcare Providers

Hypertension In ER

- **Uncontrolled BP is strongly associated with heart failure, myocardial infarction, stroke, vascular dementia, and chronic kidney disease.**
- **Approximately half of a cohort of ED patients with elevated BP, but no diagnosis of HTN who were given devices for home BP measurements, were found to have persistent BP elevations**

Hypertension emergencies

- Hypertension but associated with **acute target organ damage (TOD)**, HTN represents a component of a truly critical condition that warrants emergent intervention.
- this is relatively rare, and, for the vast majority, acute TOD will not be present, even in the setting of markedly elevated BP.

Hypertension In ER.

- **Hypertensive emergency**—a disease state defined by acute TOD, manifest by newly developed clinical sequelae or diagnostic test Abnormalities although it has been estimated that 1% to 2% of patients with chronic HTN will experience
- **Poorly controlled chronic HTN**—a presentation in which patients with established HTN are found to have elevated BP without specific attributable symptoms or evidence of acute TOD.
- **Elevated BP without prior history of HTN**—a asymptomatic, but this is potentially misleading because nonspecific symptoms (e.g., low-grade or recurrent headache, chest pain, dyspnea, dizziness, generalized weakness, focal but anatomically uncorrelated weakness or numbness, vague visual disturbances) are frequently present. However, with the exception of dyspnea, the occurrence of these symptoms appears to be unrelated to the degree of BP elevation

Hypertension in ER types:

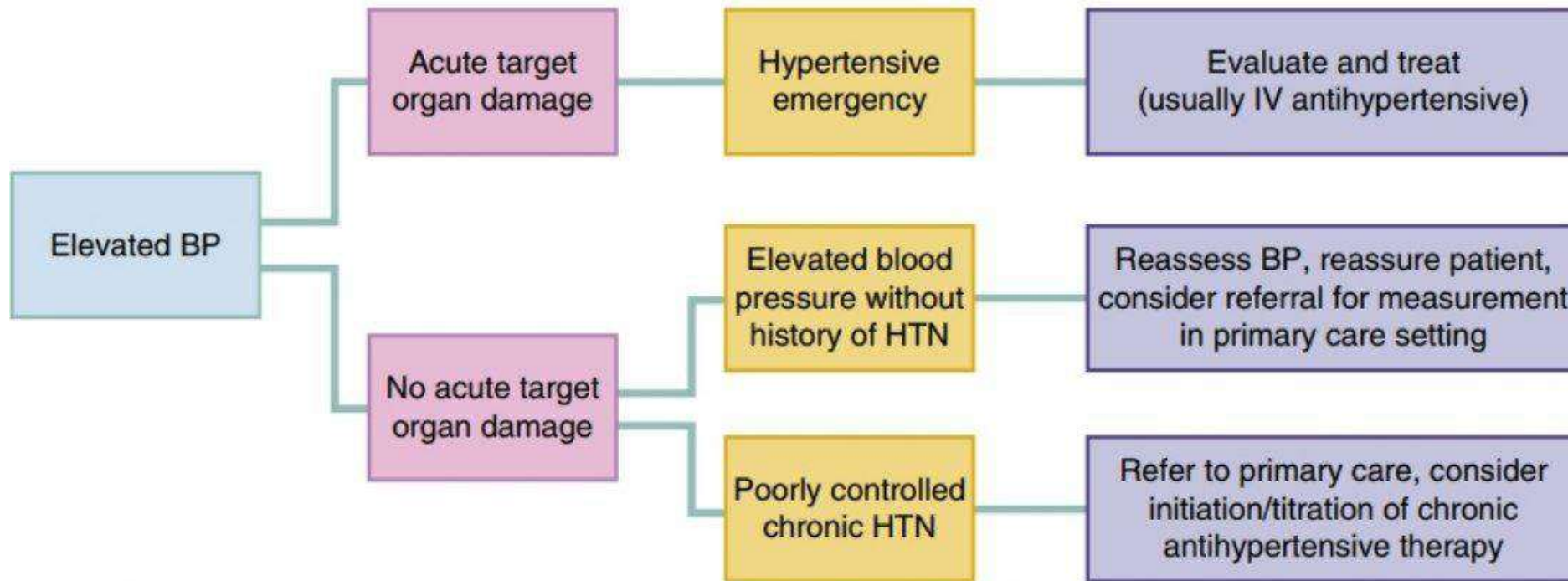


Fig. 70.1 Schematic for the approach to elevated blood pressure (*BP*) in the emergency department. *HTN*, Hypertension; *IV*, intravenous.

Hypertension emergencies: ask and exam

- **Cardiovascular:**
 - **Chest pain/syncope** (MI, unstable angina, aortic dissection)
 - **Backpain** (aortic dissection): Check BP in both arms, radioradial, radiofemoral delay
 - **Dyspnea** (pul. oedema, CHF): Peripheral edema, increase JVP, pulse deficit S3, S4, diastolic murmur, pansystolic murmur Basal lung crepitations.

Hypertension emergencies: ask and exam

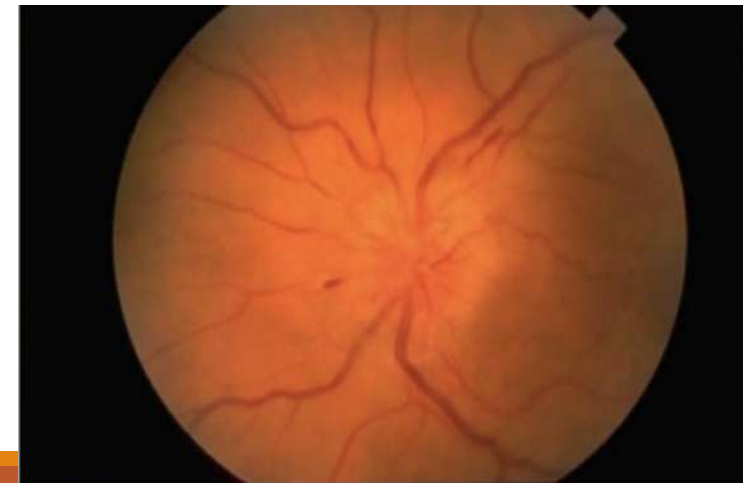
- Neurological

- **Seizures/ altered mental status** (encephalopathy)
- **Focal weakness** (CVA, TIA)
- **Headache/ visual disturbance** (central nervous system compromise)
- **Fundoscope:** hemorrhage, exudates, papilledema
- **Intractable vomiting**

- Renal:

Decreased urine output

Bloody or frothy urine



Papilledema, blurred optic disk, hemorrhages

Hypertension emergencies: ask and exam

- others

- **Pregnancy and hypertension** (pre-eclampsia)
- **Sympathetic drugs** (amphetamine, cocaine, MAO)
- **pheochromocytoma**

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TABLE 70.3 Hypertensive Emergencies by Organ System

Injury Pattern by Target Organ	Approximate Incidence^a (%)
Heart (cumulative) <ul style="list-style-type: none">• Acute heart failure• Acute coronary syndrome	27–49 14–37 11–12
Brain (cumulative) <ul style="list-style-type: none">• Acute ischemic stroke• Spontaneous intracranial hemorrhage• Hypertensive encephalopathy	37–45 6–25 5–23 8–16
Kidney <ul style="list-style-type: none">• Acute renal risk• Acute kidney injury	15 8
Vascular <ul style="list-style-type: none">• Aortic dissection	1–2
Other <ul style="list-style-type: none">• Eclampsia• Acute hypertensive retinopathy	2 1

^aAdapted from Levy P. Hypertensive emergencies: on the cutting edge. Advancing the standard of care: cardiovascular and neurovascular emergencies. www.emcreg.org.

Hypertension without TOD

- acute BP reduction in the ED provides absolutely no benefit to patients with chronic HTN without acute TOD and **exposes them to unnecessary risk of potential hypoperfusion** in regions in which blood flow has been governed by long-standing autoregulation.
- When these patients have symptoms such as headache or chest pain, and there is no suspicion of acute TOD, treatment should be directed toward the symptoms.

Hypertension emergency notes:

- **headache, epistaxis, and dizziness are not**, in and of themselves, evidence of acute TOD and, in isolation, do not constitute a hypertensive emergency, nor do they indicate the need for acute BP reduction.
- **Moderate or severe retinopathy correlate with the encephalopathy.**

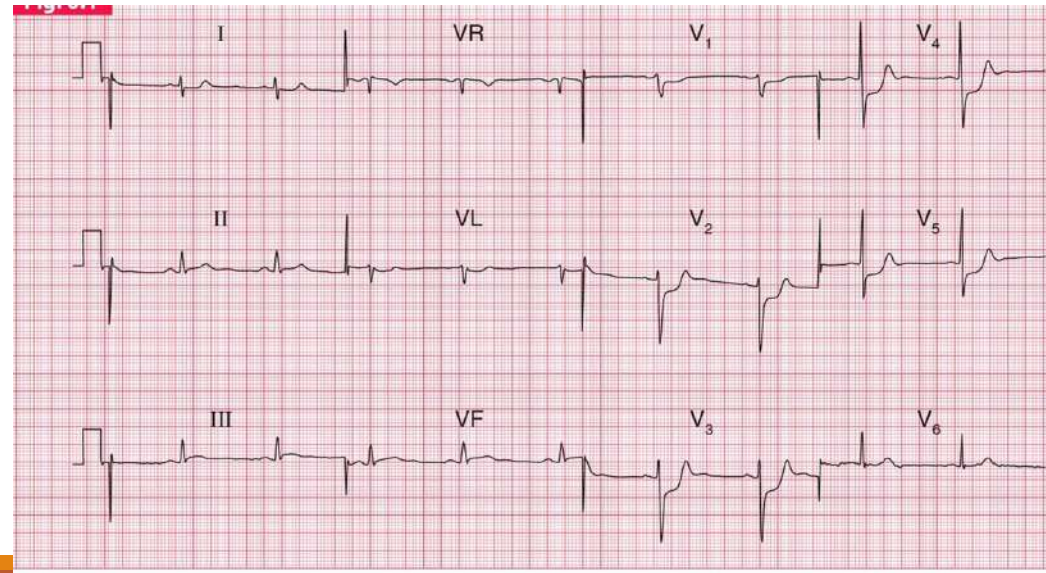
Investigations?

- **In the only prospective multicenter study of recommended routine tests (e.g., basic metabolic panel, urinalysis, electrocardiography, chest x-ray) performed in the ED, clinically meaningful abnormalities were detected in only 6% of patients, none of which were definitively attributable to HTN.**
- **However, in settings where HTN-related kidney disease is prevalent (e.g., predominantly Black American communities), evaluation of renal function by a basic metabolic panel may be a reasonable consideration**

Investigations?



- **SO send according to history or exam**



Management

Goal: stop progression of target organ damage & avoid organ hypoperfusion.

- All patients are admitted to the ER or ICU.**
- Parenteral therapy** should be initiated immediately.
- IV access**

A general goal:

The initial goal therapy to **reduce MAP no more than 25% (within minutes to 1 hour)** then if stable to **160/100 to 110 mm Hg within the next 2 to 6 hours** then to initiate **oral therapy.**

Neurologic emergency

1. Hypertensive encephalopathy: **the general goal.**

- some resources mention to reduce MAP by 30 to 40% rapidly by 1 hour and as symptoms goes away

* use Nicardipine as first line, or labetalol

Neurologic emergency

2. Ischemic stroke: **depend on thrombolytic**

- if needed, or other TOD reduce BP to **185/110**.
- if not needed, **lower MAP by 15 % in 24 hours only if more 220/120**. (NO BIG role for the ER doctor)

* use Nicardipine as first line, or labetalol

Neurologic emergency

3. ICH:

- Reduce systolic BP to **less than 140 in 1 hour.**

* use Nicardipine as first line, or labetalol



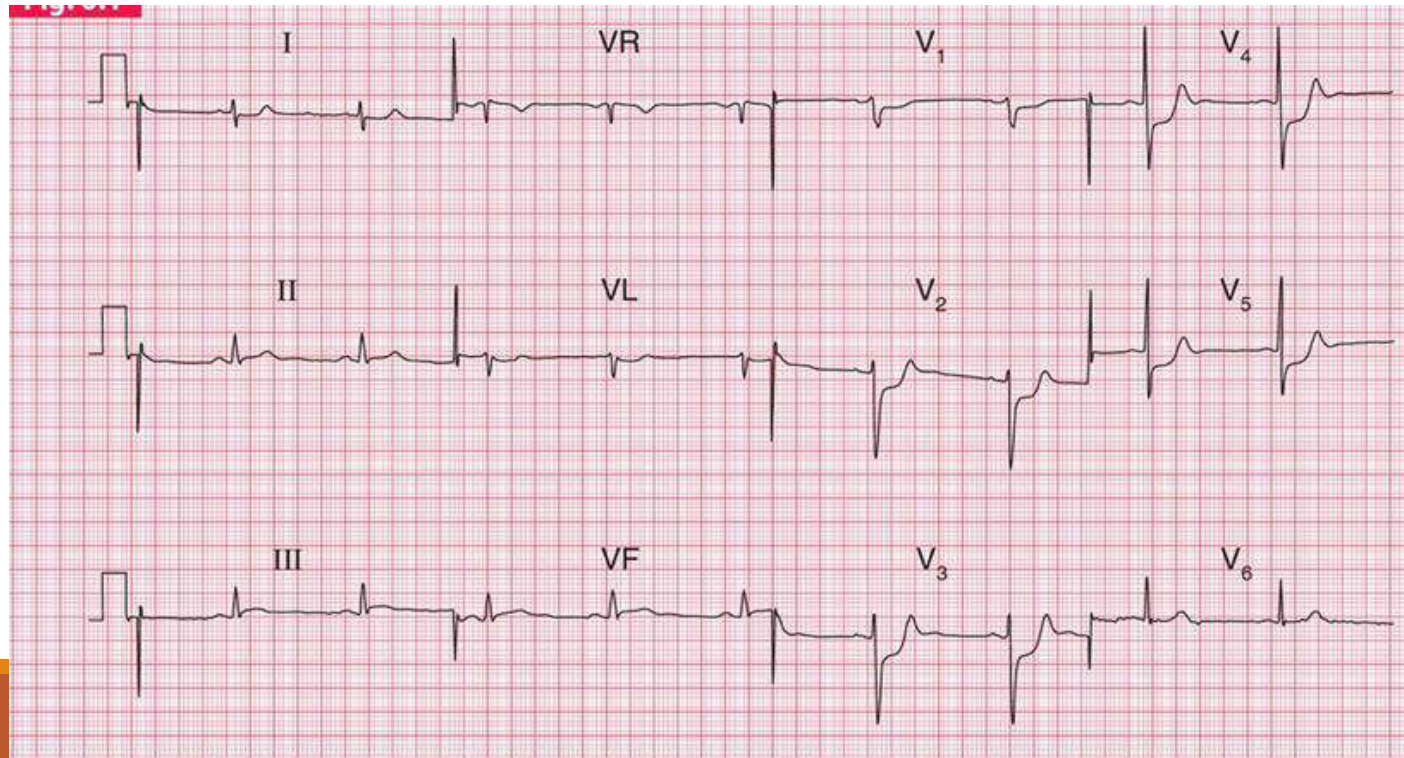
Neurologic emergency

Acute ischemic stroke ^a	Reduce hemorrhagic conversion and edema while avoiding regional hypoperfusion	<i>Primary</i> —nicardipine or clevidipine <i>Secondary</i> —labetalol	Esmolol	Acute BP reduction is indicated only with planned fibrinolytic administration or when secondary target organ dysfunction is involved.
Acute intracerebral hemorrhage ^a	Reduce hematoma expansion and perihematomal edema	<i>Primary</i> —nicardipine <i>Secondary</i> —labetalol	Esmolol	BP may decrease with pain management alone. Clevidipine is currently under investigation.
Hypertensive encephalopathy ^a	Decrease brain edema, reduce intracranial pressure, improve autoregulatory control	<i>Primary</i> —nicardipine <i>Secondary</i> —labetalol	Esmolol, enalaprilat	Other causes of altered mental status should be considered in the evaluation.

Cardiac emergency

1. ACS: **the general goal.**

* use Nitroglycerin as first line, with Beta blockers IV if not C/I



Cardiac emergency

2. Acute heart failure: **the general goal.**

-some resources mention to reduce MAP by 30 to 40% rapidly as symptoms goes away.

* use Nitroglycerin as first line, or enalaprilat

Cardiac emergency

3. Aortic dissection:

-aim to **HR of less 60 and Systolic BP to 110.**

*** use Esmolol (or labetalol) then after HR less than 60, use sodium nitroprusside to lower BP by 100-120.**

Cardiac emergency: summary

Indication	Goals of Treatment	Optimal Agents	Alternative Therapy	Caveats
Acute coronary syndromes	Diminish cardiac workload and improve coronary artery perfusion	<i>Primary</i> —nitroglycerin <i>Secondary</i> —metoprolol, labetalol	Esmolol, nicardipine	Routine use of intravenous beta blocker therapy is controversial.
Acute heart failure syndromes	Reduce impedance to forward flow and diminish cardiac workload	<i>Primary</i> —nitroglycerin, furosemide <i>Secondary</i> —enalaprilat	Clevidipine, nicardipine, sodium nitroprusside	Intubation or noninvasive ventilatory support decreases preload and may drop BP. Enalaprilat may cause sustained hypotension. Although FDA-approved, use of nesiritide is controversial.
Aortic dissection	Reduce shear force and dp/dt	<i>Primary</i> —esmolol plus sodium nitroprusside <i>Secondary</i> —labetalol	Esmolol plus (clevidipine or nicardipine), diltiazem, verapamil	Avoid beta blockers if aortic regurgitation is present.

others

1. Preclampsia

-aim to **BP less than 160/105 (or to less than 140 systolic) immediately.**

*** use labetalol or nicardipine and magnesium**

others

2. AKI: the general goal.

* use felodopam as first line, or labetalol

others

3. Sympathetic crisis: reduce BP

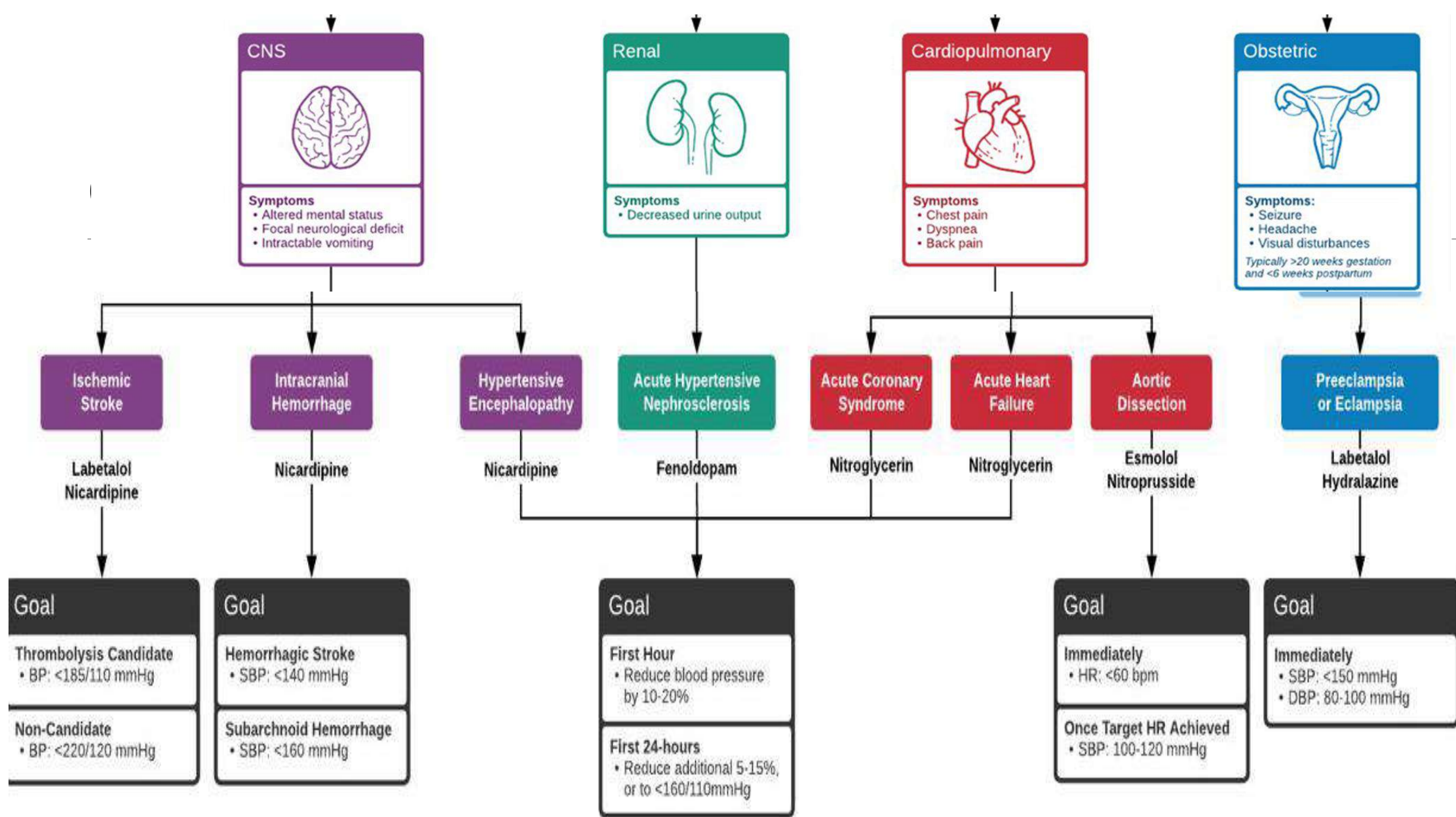
-aim to **BP less than 160/105 immediately.**

*** use phentolamine as first line, or nitroglycerin + benzodiazepines in some drugs.**

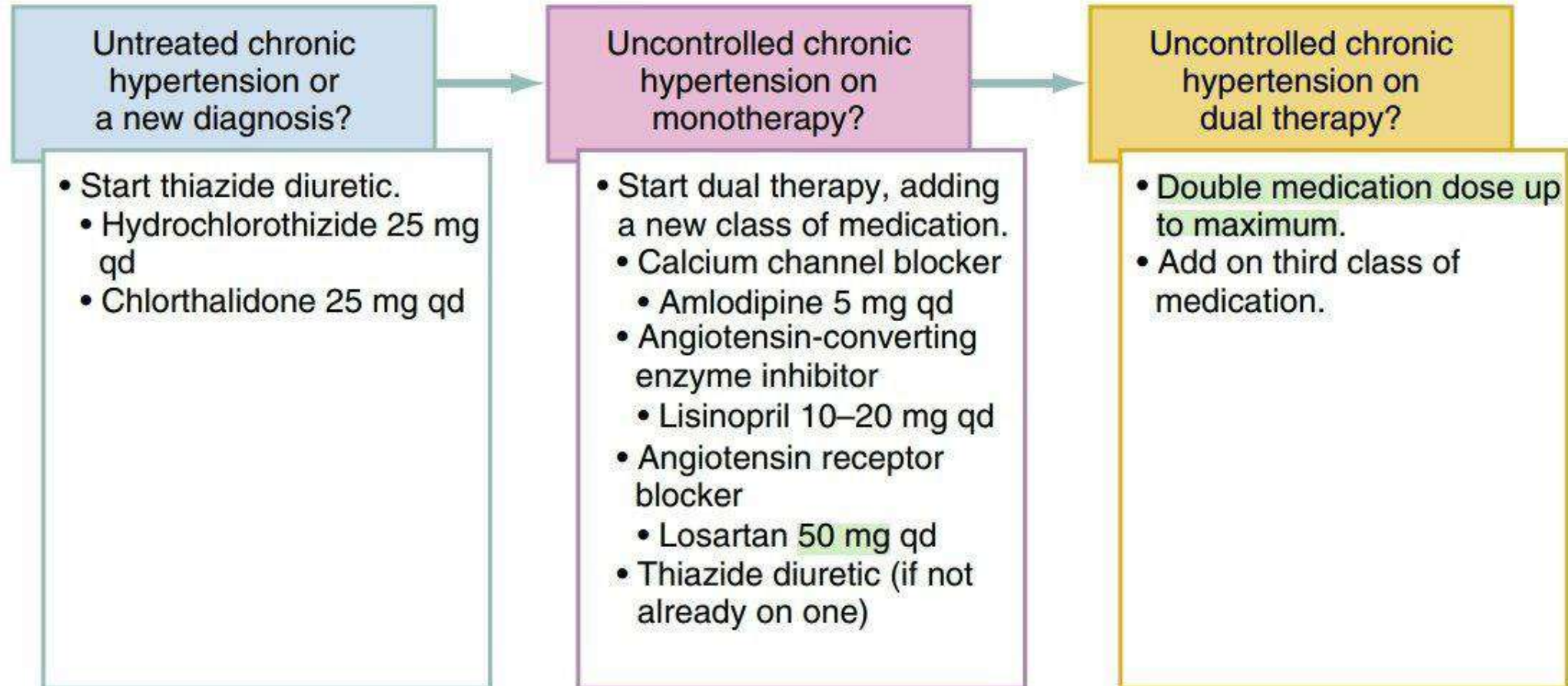
others

autoregulatory control

Acute kidney injury	Decrease pressure in renal parenchyma and glomerular apparatus	<i>Primary</i> — <i>Secondary</i> — clevidipine, nicardipine	Labetalol, sodium nitroprusside	Angiotensin-converting enzyme inhibitors and diuretics should be avoided.
Preeclampsia and eclampsia	Decrease intracranial pressure while maintaining placental perfusion	<i>Primary</i> —hydralazine <i>Secondary</i> —labetalol	Nicardipine	Intravenous magnesium (4 g initially) is administered in all cases. Emergent cesarean section is definitive treatment.
Sympathetic crisis	Reduce alpha1-adrenergic receptor-mediated vasoconstriction	<i>Primary</i> —phentolamine <i>Secondary</i> — nitroglycerin	Fenoldopam, clevidipine, nicardipine, sodium nitroprusside	Benzodiazepines are first-line therapy when sympathetic crisis is caused by cocaine or amphetamines. Beta-blocker monotherapy (including labetalol) is relatively contraindicated.



Hypertension urgency:



Recommendations

- **Not all hypertensives in clinics have hypertension, we need a proper ambulatory home readings (white coat HTN), unless TOD is seen**
- **In most of our hospitals, the available IV drugs are usually Nitroglycerin, metoprolol and hydralazine.**
- **This lecture also to be delivered to nursing staff, as many may have a misinterpretation of an urgency to an emergency**
- **People should be taught about when to visit the ER, not depending merely on a high readings.**

Hypertension

How do hypertensive patients look like when they come to a clinic?

Patients with hypertension who come to the clinic may appear quite normal and may not exhibit obvious physical symptoms related to their blood pressure. However, some general observations can be made:

1. Appearance: They may appear generally healthy and without acute distress. Signs of severe hypertension or hypertensive crisis could include symptoms like severe headache, visual disturbances, chest pain, shortness of breath, or neurological symptoms, but these are less common in routine clinic visits.

2. Risk Factors: Many patients with hypertension may have risk factors such as obesity, sedentary lifestyle, poor dietary habits (high salt intake), smoking, or family history of hypertension or cardiovascular disease.

3. Other Medical Conditions: They may have coexisting medical conditions such as diabetes, dyslipidemia (abnormal cholesterol levels), or other chronic diseases.

4. Routine Examination: During examination, typical findings may include elevated blood pressure readings (if not well-controlled), signs of target organ damage (e.g., retinopathy on fundoscopic exam, enlarged heart on cardiac auscultation, or evidence of kidney disease).

5. Lifestyle Factors: Clinicians may discuss lifestyle factors such as diet, exercise, stress management, and adherence to prescribed medications as part of managing hypertension.

Available drugs of choice in emergency hypertension?

In cases of emergency hypertension, where blood pressure is severely elevated and there is a risk of organ damage, several medications are commonly used to rapidly lower blood pressure. These include:

1. **Intravenous (IV) Beta-blockers:** Such as labetalol or esmolol, which help lower blood pressure quickly.
2. **Nitroglycerin:** Often used if there is acute coronary syndrome or heart failure accompanying hypertension.
3. **Intravenous Sodium Nitroprusside:** A potent vasodilator used in critical situations to reduce blood pressure rapidly.
4. **Intravenous Nicardipine:** A calcium channel blocker that can be administered to lower blood pressure in emergencies.
5. **Intravenous Hydralazine:** A direct-acting vasodilator used in hypertensive emergencies

These medications are typically administered in a hospital setting under close monitoring due to their potent effects and the need to adjust dosages based on individual patient response. Treatment decisions are guided by the severity of hypertension, presence of symptoms, and any underlying medical conditions.

How to train the nurses to deal with emergency hypertension cases?

Nurses who deal with emergency hypertension require specialized training to effectively manage acute situations where blood pressure levels pose immediate risks. Training typically includes:

1. **Understanding Hypertensive Emergencies:** Nurses learn to recognize signs and symptoms of severe hypertension and associated complications such as hypertensive encephalopathy, acute heart failure, or aortic dissection.
2. **Emergency Protocols:** Training in emergency protocols for rapid blood pressure reduction using intravenous medications like nitroprusside, labetalol, or nicardipine.
3. **Monitoring and Assessment:** Skills in continuous monitoring of vital signs, neurological status, urine output, and other parameters crucial for assessing response to treatment.

4. **Collaboration and Communication:** Effective communication within the healthcare team to coordinate rapid response and treatment adjustments based on patient condition.

5. **Patient Education:** Educating patients and families on hypertension management, adherence to medications, and lifestyle modifications to prevent future emergencies.

6. **Simulation and Practical Exercises:** Hands-on training through simulations and practical exercises to simulate emergency scenarios and practice critical interventions.

Nurses often undergo regular updates and refreshers to stay current with evolving guidelines and practices in emergency hypertension management. This ensures they can provide timely and effective care to patients experiencing hypertensive emergencies.

Latest updates about hypertension?

- **Diagnostic Thresholds:** The guidelines from organizations like the American College of Cardiology (ACC) and the American Heart Association (AHA) have updated the diagnostic criteria for hypertension. The threshold for diagnosing hypertension is now **systolic blood pressure (SBP) \geq 130 mm Hg or diastolic blood pressure (DBP) \geq 80 mm Hg**. This change aims to emphasize earlier intervention to reduce cardiovascular risk.
- **Role of Lifestyle Modifications:** Lifestyle interventions such as adopting a heart-healthy diet (e.g., DASH diet), **increasing physical activity, weight management, reducing sodium intake, moderation of alcohol consumption, and stress management** continue to be crucial in managing hypertension.

- Home Blood Pressure Monitoring: There is increasing recognition of the importance of home blood pressure monitoring (HBPM) and ambulatory blood pressure monitoring (ABPM) in diagnosing and managing hypertension. These methods provide a more comprehensive assessment of a patient's blood pressure outside of the clinic setting.
- Pharmacological Treatment Options: While lifestyle modifications are fundamental, pharmacological treatment remains essential for many patients with hypertension. Commonly used classes of medications include thiazide diuretics, ACE inhibitors, angiotensin II receptor blockers (ARBs), calcium channel blockers, and others, chosen based on individual patient characteristics and preferences.

Educating our population

1. **Understanding Hypertension:** Providing clear and simple explanations about what hypertension is, emphasizing that it is often symptomless but can lead to serious health issues if untreated.
2. **Risk Factors:** Educating about common risk factors such as unhealthy diet (high in salt and fats), lack of physical activity, obesity, smoking, excessive alcohol consumption, and family history of hypertension.
3. **Lifestyle Modifications:** Promoting lifestyle changes that can help prevent or manage hypertension, including adopting a balanced diet (such as the DASH diet), regular physical activity, weight management, reducing salt intake, and quitting smoking.
4. **Blood Pressure Monitoring:** Encouraging regular blood pressure checks, either at home or through healthcare providers, to detect hypertension early.

5. **Signs and Symptoms:** Highlighting possible signs and symptoms of severe hypertension or hypertensive emergencies that require immediate medical attention, such as severe headaches, shortness of breath, chest pain, and blurred vision.

6. **Medication Adherence:** Educating about the importance of adhering to prescribed medications for those diagnosed with hypertension, and potential side effects.

7. **Regular Health Check-ups:** Encouraging regular visits to healthcare providers for overall health assessments, including blood pressure measurements.

8. **Community Outreach:** Conducting community health programs, workshops, and campaigns to raise awareness about hypertension, its risks, and preventive measures.

9. **Continued Education:** Providing ongoing education and updates on hypertension guidelines, treatment options, and lifestyle recommendations to ensure the population stays informed.

THANK YOU

