

# Management of Hypertension Emergencies

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# Clinical Practice Guideline

## **2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults**

### **A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines**

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# **2018 ESC/ESH Guidelines for the management of arterial hypertension**

**The Task Force for the management of arterial hypertension of the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH)**

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## REVIEW ARTICLE OPEN

## Management of hypertensive crisis: British and Irish Hypertension Society Position document

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Patients with hypertensive emergencies, malignant hypertension and acute severe hypertension are managed heterogeneously in clinical practice. Initiating anti-hypertensive therapy and setting BP goal in acute settings requires important considerations which differ slightly across various diagnoses and clinical contexts. This position paper by British and Irish Hypertension Society, aims to provide clinicians a framework for diagnosing, evaluating, and managing patients with hypertensive crisis, based on the critical appraisal of available evidence and expert opinion.

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## INTRODUCTION

High blood pressure (BP) is the most prevalent and important modifiable risk factor for cardiovascular disease and disability, worldwide [1]. In 2015, Public Health England reported that high BP affects more than 1 in 4 adults in England. The disease burden is even larger in low- and middle-income countries (LMIC) [2–4]. There is ample, robust evidence supporting the use of anti-hypertensive drugs in reducing the risks of cardiovascular disease and another organ damage [5]. In contrast, acute severe elevation in BP is much less common now than in previous decades [6]. This may be attributed to more widespread screening, awareness, and better management and care models for chronic hypertension (HTN) especially in developed countries. Nevertheless, patients still present with hypertensive crises, which may be life-threatening, resulting in rapid end organ damage and/or death.

There is a lack of robust outcome data specifying BP targets, the speed of BP reduction and specific medications in patients with hypertensive crises (NICE, 2019 [7]). Management is largely based on expert opinion. Predictably, there is considerable heterogeneity and inconsistency in how severe HTN is managed in clinical practice, and often scant coverage in national and international HTN guidelines. Although the need to lower markedly elevated BP is widely appreciated, several factors need considering before initiating anti-hypertensive therapy. In this position paper, we aim to provide a framework for diagnosing, evaluating, and managing patients with hypertensive crisis, based on the available evidence.

An extensive literature search using PubMed and Embase was undertaken using keywords (see supplementary text). Relevant national, international guidelines and systematic reviews in

disease-specific states were reviewed and where conflicting evidence was present individual clinical trial results were evaluated. Consensus-based positions were sought from hypertension specialists within the British and Irish Hypertension Society (BIHS).

## DEFINITIONS OF ELEVATED BP STATES

Various terminologies have been applied to describe severe elevation in BP, including acute severe hypertension, hypertensive urgency, hypertensive emergency, malignant hypertension (MHT), accelerated phase hypertension and hypertensive crisis. It is important to distinguish between the key terms to guide appropriate management and minimise the potential for iatrogenic harm.

## Acute severe hypertension

The definition of 'severe' has changed progressively in the last 70 years. Most experts would accept that a BP of >200/120 mmHg is severe, and needs urgent attention, but the degree of urgency depends on the precise circumstances. For example, a BP of 180/100 mmHg in a poorly adherent, uncontrolled chronically hypertensive patient, would not usually be considered as acute severe HTN needing immediate treatment, whereas a BP of 160/100 mmHg would be a medical (hypertensive) emergency in the context of acute end organ damage (EOD), such as preeclampsia. We prefer the term 'acute severe hypertension' to indicate patients with severe elevation in BP without evidence of acute and/or life-threatening EOD. Most patients presenting to



## Review

## The Management of Hypertensive Emergencies—Is There a “Magical” Prescription for All?

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**Abstract:** Hypertensive emergencies (HE) represent high cardiovascular risk situations defined by a severe increase in blood pressure (BP) associated with acute, hypertension mediated organ damage (A-HMOD) to the heart, brain, retina, kidneys, and large arteries. Blood pressure values alone do not accurately predict the presence of HE; therefore, the search for A-HMOD should be the first step in the management of acute severe hypertension. A rapid therapeutic intervention is mandatory in order to limit and promote regression of end-organ damage, minimize the risk of complications, and improve patient outcomes. Drug therapy for HE, target BP, and the speed of BP decrease are all dictated by the type of A-HMOD, specific drug pharmacokinetics, adverse drug effects, and comorbidities. Therefore, a tailored approach is warranted. However, there is currently a lack of solid evidence for the appropriate treatment strategies for most HE. This article reviews current pharmacological strategies while providing a stepwise, evidence based approach for the management of HE.

**Keywords:** hypertension; hypertensive emergency; hypertensive urgency; hypertensive crisis; target organ damage; therapeutic approach



## ESH Guidelines

# 2023 ESH Guidelines for the management of arterial hypertension *The Task Force for the management of arterial hypertension of the European Society of Hypertension*

Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA)

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## Evaluation and treatment of hypertensive emergencies in adults

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## INTRODUCTION AND TERMINOLOGY

— Most patients with significantly elevated blood pressure (systolic pressure  $\geq 180$  mmHg and/or diastolic pressure  $\geq 120$  mmHg) have no acute, end-organ injury (so called severe asymptomatic hypertension). Although some propose relatively rapid initiation of antihypertensive therapy in this setting, there may be more risk than benefit from such an aggressive regimen. (See "[Management of severe asymptomatic hypertension \(hypertensive urgencies\) in adults](#)".)

By contrast, some patients with significantly elevated blood pressure have signs or symptoms of acute, ongoing target-organ damage. Such patients have a hypertensive emergency [1]. Hypertensive emergencies can develop in patients with or without known preexisting hypertension [2,3]. In younger (<60 years of age) people, the diastolic pressure is typically  $\geq 120$  mmHg, but there is no specific threshold since individuals who develop an acute rise in blood pressure can develop symptoms if the previous pressure was normal (such as in a pregnant person who develops eclampsia or a young adult who develops acute glomerulonephritis).

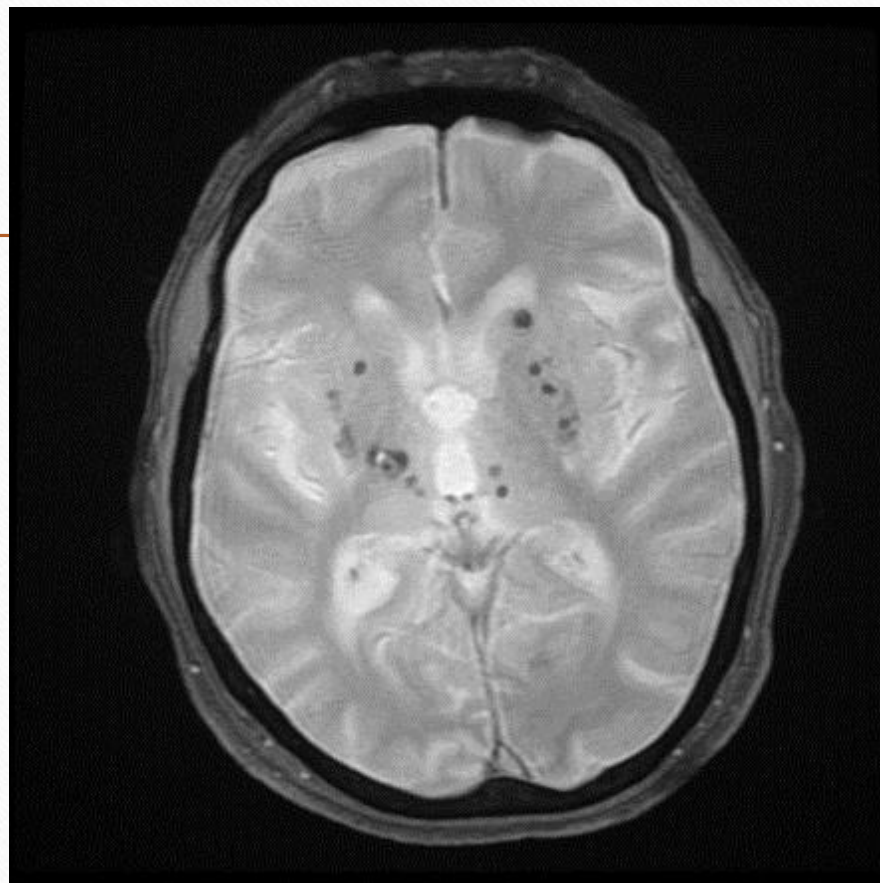
The term "malignant hypertension" entered the medical lexicon in 1928 because, at that time, patients with this condition had a prognosis that was similar to patients with many cancers. However, antihypertensive therapies that can quickly and safely lower blood pressure have improved outcomes [4].

## Case

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- The patient is a 64-years-old man who presented with severe headache, visual disturbances, diaphoresis & drowsiness
  - *BP= 240/140 mmHg , PR = 100 BPM*
  - *ECG : NSR- NAX- PRP*
  - *hsTn : Negative*
  - *Cr= 1.6 mg/dl*
  - Echocardiography : LVEF : 50 %, severe concentric LVH, mild MR ,mild TR , no AS , no AI









## Classification of office BP and definitions of hypertension grade

Category	Systolic (mmHg)		Diastolic (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

# Hypertension urgencies and emergencies

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- Hypertension emergencies are situations in which *severe hypertension (grade 3)* is associated with *acute HMOD (Hypertension-mediated organ damage)*, which is often life threatening and requires *immediate* but careful intervention to lower BP, usually with *intravenous (i.v.) therapy*
- The rate and magnitude of an increase in BP may be at least as important as the absolute level of BP in determining the magnitude of organ injury



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- **Hypertensive emergencies** are defined as severe elevations in **BP** (**>180/120 mm Hg**) associated with evidence of new or worsening target organ damage
  - **The 1-year death rate** associated with hypertensive emergencies is **>79%**, and the **median survival is 10.4 months** if the emergency is left untreated

# Typical presentations of a hypertension emergency are:

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**1- Patients with malignant hypertension**, characterized by severe hypertension (usually grade 3) associated with :

- Funduscopic changes (flame haemorrhages and/or papilloedema), microangiopathy
- DIC
- Encephalopathy (in about 15% of cases)
- Acute heart failure
- Acute deterioration in renal function

The hallmark of this condition is small artery fibrinoid necrosis in the kidney, retina, and brain. The term 'malignant' reflects the very poor prognosis for this condition if untreated



# Examples of target organ damage

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- Hypertensive encephalopathy
- ICH
- Acute ischemic stroke
- Acute MI
- Acute LV failure
- Pulmonary edema
- Unstable angina pectoris
- Dissecting aortic aneurysm
- Acute renal failure
- Eclampsia

## Typical presentations of a hypertension emergency are:

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**2-Patients with severe hypertension associated with other clinical conditions**

who are likely to require an urgent reduction of BP, e.g. acute aortic dissection, acute myocardial ischaemia, or acute heart failure

**3- Patients with sudden severe hypertension due to pheochromocytoma, associated with organ damage**

**4- Pregnant women with severe hypertension or preeclampsia**



## The most common emergency symptoms will depend of the organs affected but may include

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- Headache, visual disturbances, chest pain, dyspnea, dizziness, and other neurological deficits.
- In patients with hypertensive encephalopathy, the presence of somnolence, lethargy, tonic clonic seizures, and cortical blindness may precede a loss of consciousness;
- However, focal neurological lesions are rare and should raise the suspicion of stroke

## Hypertension Urgency

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- Severe hypertension in patients presenting to the emergency department in whom there is no clinical evidence of acute HMOD Whilst these patients require BP reduction
- They do not usually require admission to hospital, and BP reduction is best achieved with oral medication
- These patients will require urgent outpatient review to ensure that their BP is coming under control



## 11.2. Hypertensive Crises—Emergencies and Urgencies

### Recommendations for Hypertensive Crises and Emergencies

References that support recommendations are summarized in **Online Data Supplement 55**.

COR	LOE	Recommendations
I	B-NR	1. In adults with a hypertensive emergency, admission to an intensive care unit is recommended for continuous monitoring of BP and target organ damage and for parenteral administration of an appropriate agent (Tables 19 and 20). <sup>S11.2-1,S11.2-2</sup>

## Acute management of hypertensive emergencies

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- Apart from acute BP lowering in stroke, there are no RCTs evaluating different treatment strategies for hypertensive emergencies
- The key considerations in defining the treatment strategy are:



## Acute management of hypertensive emergencies

- (1) Establishing the target organs that are affected, whether they require any specific interventions other than BP lowering, and whether there is a precipitating cause for the acute rise in BP that might affect the treatment plan (e.g. pregnancy)
- (2) The recommended timescale and magnitude of BP lowering required for safe BP reduction

## Acute management of hypertensive emergencies

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(3) The type of BP-lowering treatment required.

With regard to drug treatment, in a hypertension emergency, i.v. treatment with a drug with a short half-life is ideal to allow careful titration of the BP response to treatment in a higher dependency clinical area with facilities for continuous hemodynamic monitoring



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(4) Rapid uncontrolled BP lowering is not recommended as this can lead to complications

- Although i.v. drug administration is recommended for most hypertension emergencies, oral therapy with ACE inhibitors, ARBs, or beta-blockers is sometimes very effective in malignant hypertension because the renin system is activated by renal ischemia

# Diagnostic work-up for patients with a suspected hypertension emergency

## Common tests for all potential causes

Fundoscopy is a critical part of the diagnostic work-up

12-lead ECG

Haemoglobin, platelet count, fibrinogen

Creatinine, eGFR, electrolytes, LDH, haptoglobin

Urine albumin:creatinine ratio, urine microscopy for red cells, leucocytes, and casts

Pregnancy test in women of child-bearing age

## Specific tests by indication

Troponin, CK-MB (in suspected cardiac involvement, e.g. acute chest pain or acute heart failure) and NT-proBNP

Chest X-ray (fluid overload)

Echocardiography (aortic dissection, heart failure, or ischaemia)

CT angiography of thorax and/or abdomen in suspected acute aortic disease (e.g. aortic dissection)

CT or MRI brain (nervous system involvement)

Renal ultrasound (renal impairment or suspected renal artery stenosis)

Urine drug screen (suspected methamphetamine or cocaine use)



## Recommendations for Hypertensive Crises and Emergencies (Continued)

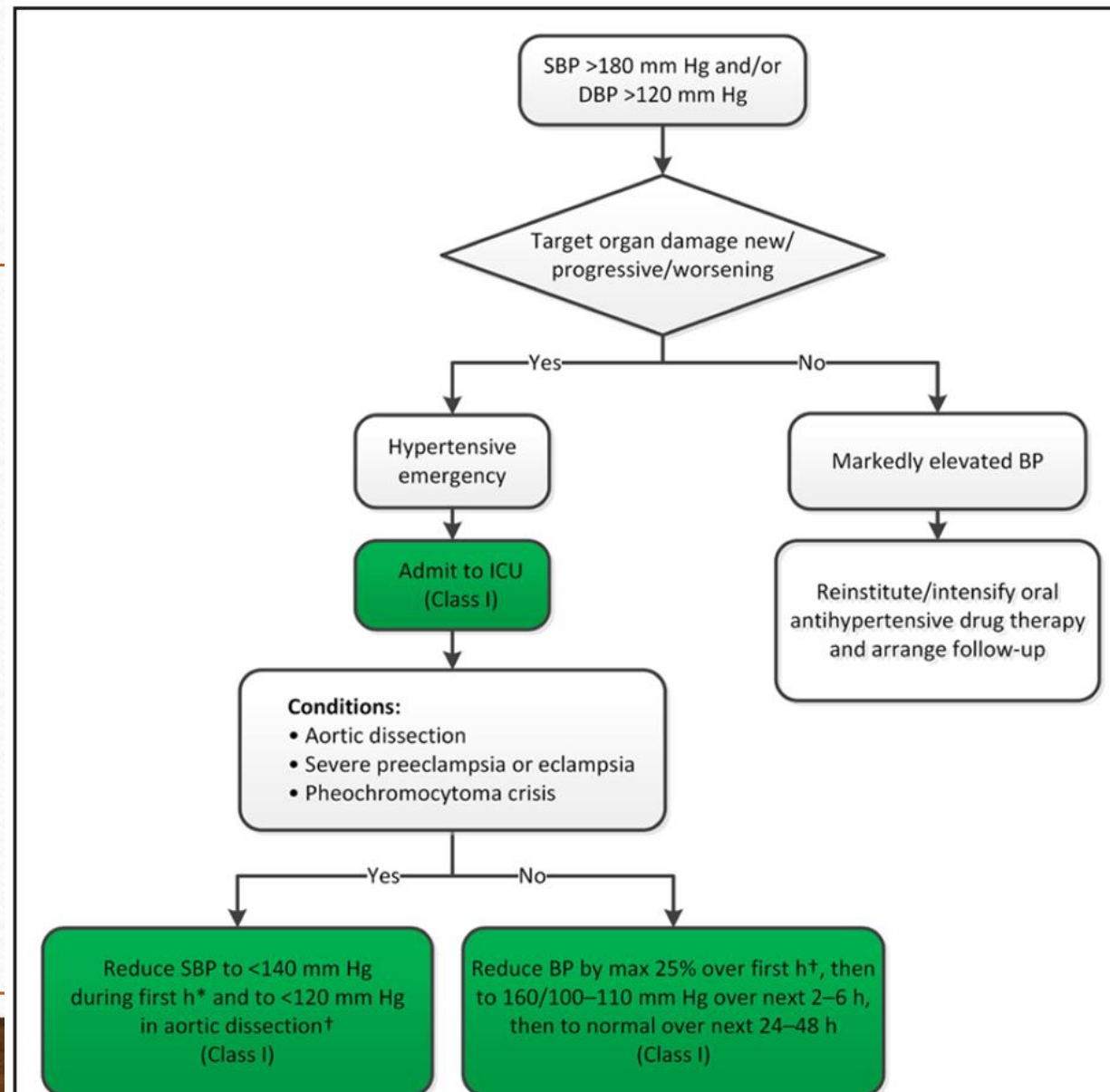
COR	LOE	Recommendations
I	C-EO	2. For adults with a compelling condition (ie, aortic dissection, severe preeclampsia or eclampsia, or pheochromocytoma crisis), SBP should be reduced to less than 140 mm Hg during the first hour and to less than 120 mm Hg in aortic dissection.
I	C-EO	3. For adults without a compelling condition, SBP should be reduced by no more than 25% within the first hour; then, if stable, to 160/100 mm Hg within the next 2 to 6 hours; and then cautiously to normal during the following 24 to 48 hours.

# Hypertensive emergencies requiring immediate BP lowering with i.v. drug therapy

Clinical presentation	Time line and target for BP reduction	First-line treatment	Alternative
Malignant hypertension with or without acute renal failure	Several hours Reduce MAP by 20–25%	Labetalol Nicardipine	Nitroprusside Urapidil
Hypertensive encephalopathy	Immediately reduce MAP by 20–25%	Labetalol Nicardipine	Nitroprusside
Acute coronary event	Immediate reduce SBP to < 140 mmHg	Nitroglycerine Labetalol	Urapidil
Acute cardiogenic pulmonary oedema	Immediately reduce SBP to < 140 mmHg	Nitroprusside or nitroglycerine (with loop diuretic)	Urapidil (with loop diuretic)
Acute aortic dissection	Immediately reduce SBP to < 120 mmHg and heart rate to < 60 bpm	Esmolol AND nitroprusside or nitroglycerine or nicardipine	Labetalol OR metoprolol
Eclampsia and severe pre-eclampsia/HELLP	Immediately reduce SBP to < 160 mmHg and DBP to < 105 mmHg	Labetalol or nicardipine and magnesium sulphate	Consider delivery



## Diagnosis and management of a hypertensive crisis



# Drug types, doses, and characteristics for treatment of hypertension emergencies - 1

Drug	Onset of action	Duration of action	Dose	Contraindications	Adverse effects
Esmolol	1–2 min	10–30 min	0.5–1 mg/kg i.v. bolus; 50–300 µg/kg/min i.v. infusion	Second- or third-degree AV block, systolic heart failure, asthma, bradycardia	Bradycardia
Metoprolol	1–2 min	5–8 h	2.5–5 mg i.v. bolus over 2 minutes; may repeat every 5 minutes to a maximum dose of 15 mg	Second- or third-degree AV block, systolic heart failure, asthma, bradycardia	Bradycardia
Labetalol	5–10 min	3–6 h	0.25–0.5 mg/kg i.v. bolus; 2–4 mg/min i.v. infusion until goal BP is reached, thereafter 5–20mg/h	Second- or third-degree degree AV block; systolic heart failure, asthma, bradycardia	Bronchoconstriction, foetal bradycardia
Fenoldopam	5–15 min	30–60 min	0.1µg/kg/min i.v. infusion, increase every 15 min with 0.05 to 0.1µg/kg/min increments until goal BP is reached	Caution in glaucoma	
Clevidipine	2–3 min	5–15 min	2 mg/h i.v. infusion, increase every 2min with 2 mg/h until goal BP		Headache, reflex tachycardia
Nicardipine	5–15 min	30–40 min	5–15 mg/h i.v. infusion, starting dose 5 mg/h, increase every 15–30 min with 2.5 mg until goal BP, thereafter decrease to 3 mg/h	Liver failure	Headache, reflex tachycardia



## Drug types, doses, and characteristics for treatment of hypertension emergencies - 2

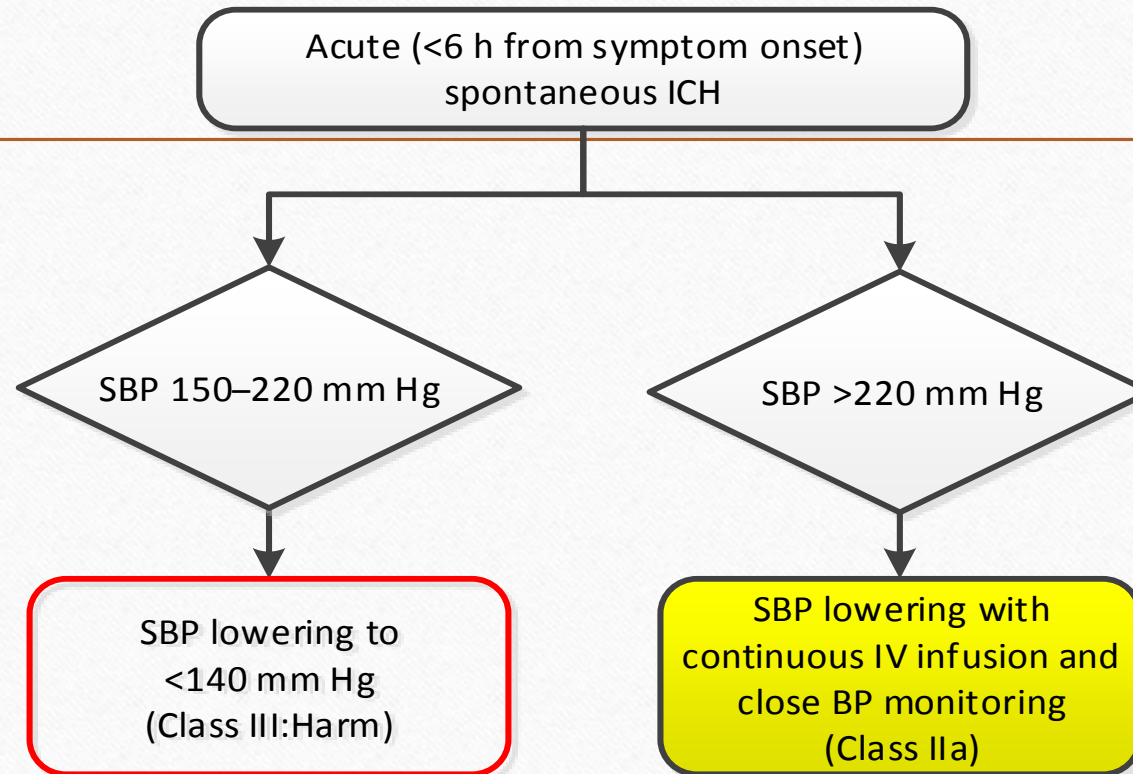
Drug	Onset of action	Duration of action	Dose	Contraindications	Adverse effects
Nitroglycerine	1–5 min	3–5 min	5–200 µg/min i.v. infusion, 5 µg/min increase every 5 min		Headache, reflex tachycardia
Nitroprusside	Immediate	1–2 min	0.3–10 µg/kg/min i.v. infusion, increase by 0.5 µg/kg/min every 5 min until goal BP	Liver/kidney failure (relative)	Cyanide intoxication
Enalaprilat	5–15 min	4–6 h	0.62–1.25 mg i.v. bolus	History of angioedema	
Urapidil	3–5 min	4–6 h	12.5–25 mg i.v. bolus; 5–40 mg/h as continuous infusion		
Clonidine	30 min	4–6 h	150–300 µg i.v. bolus over 5–10 min		Sedation, rebound hypertension
Phentolamine	1–2 min	10–30 min	0.5–1 mg/kg bolus OR 50–300 µg/kg/min i.v. infusion		Tachyarrhythmia, chest pain

## Acute Intracerebral Hemorrhage

COR	LOE	Recommendations for Management of Hypertension in Patients With Acute Intracerebral Hemorrhage (ICH)
<b>IIa</b>	<b>C-EO</b>	In adults with ICH who present with SBP greater than 220 mm Hg, it is reasonable to use continuous intravenous drug infusion and close BP monitoring to lower SBP.
<b>III: Harm</b>	<b>A</b>	Immediate lowering of SBP to less than 140 mm Hg in adults with spontaneous ICH who present within 6 hours of the acute event and have an SBP between 150 mm Hg and 220 mm Hg is not of benefit to reduce death or severe disability and can be potentially harmful.



## Management of Hypertension in Patients With Acute ICH



## Acute Ischemic Stroke

COR	LOE	Recommendations for Management of Hypertension in Patients With Acute Ischemic Stroke
I	B-NR	Adults with acute ischemic stroke and elevated BP who are eligible for treatment with intravenous tissue plasminogen activator should have their BP slowly lowered to less than 185/110 mm Hg before thrombolytic therapy is initiated.
I	B-NR	In adults with an acute ischemic stroke, BP should be less than 185/110 mm Hg before administration of intravenous tissue plasminogen activator and should be maintained below 180/105 mm Hg for at least the first 24 hours after initiating drug therapy.
IIa	B-NR	Starting or restarting antihypertensive therapy during hospitalization in patients with BP greater than 140/90 mm Hg who are neurologically stable is safe and reasonable to improve long-term BP control, unless contraindicated.



## Acute Ischemic Stroke (cont.)

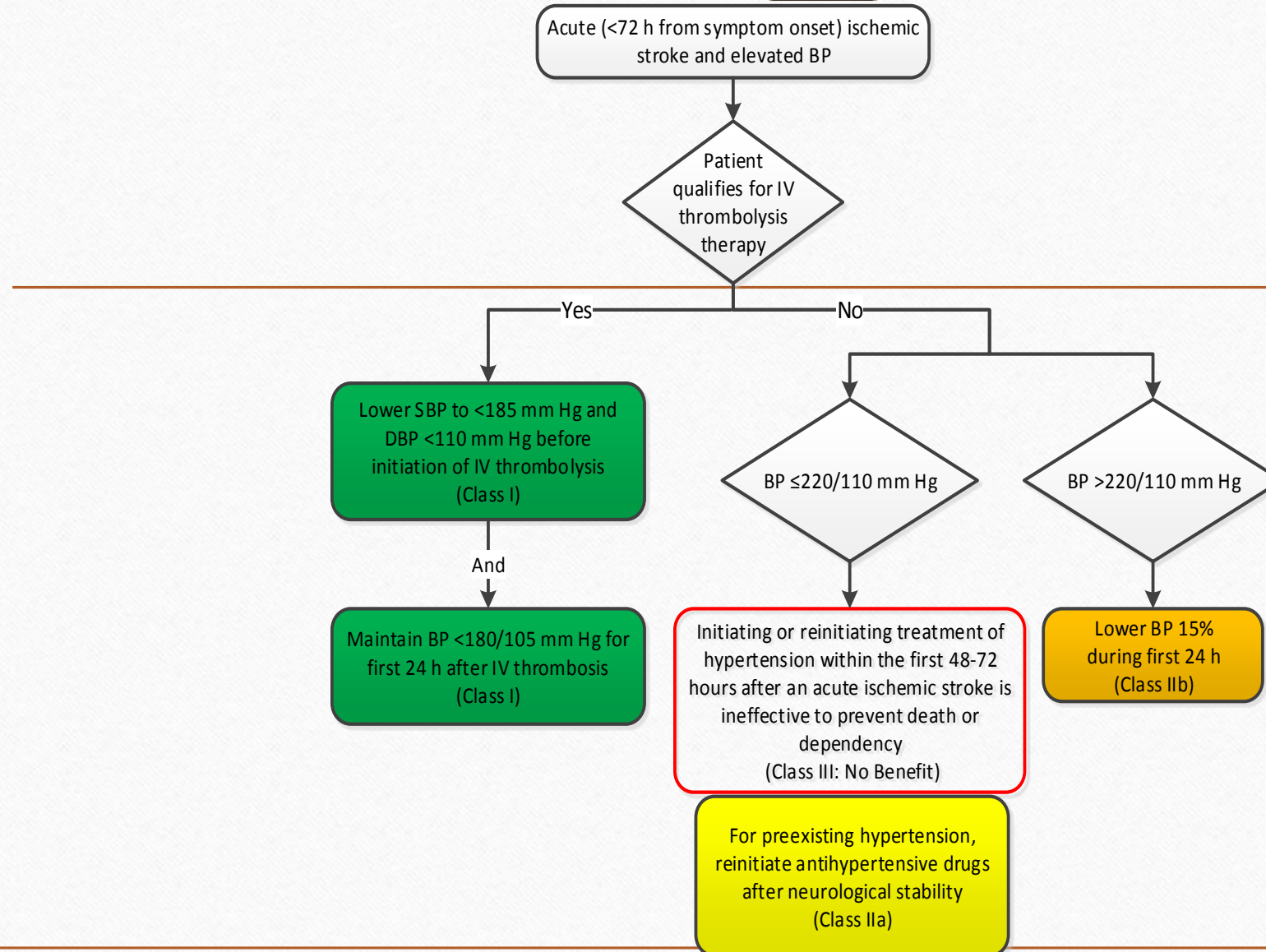
COR	LOE	Recommendations for Management of Hypertension in Patients With Acute Ischemic Stroke
I <b>b</b>	C-EO	In patients with BP of 220/120 mm Hg or higher who did not receive intravenous alteplase or endovascular treatment and have no comorbid conditions requiring acute antihypertensive treatment, the benefit of initiating or reinitiating treatment of hypertension within the first 48 to 72 hours is uncertain. It might be reasonable to lower BP by 15% during the first 24 hours after onset of stroke.
III: No Benefit	A	In patients with BP less than 220/120 mm Hg who did not receive intravenous thrombolysis or endovascular treatment and do not have a comorbid condition requiring acute antihypertensive treatment, initiating or reinitiating treatment of hypertension within the first 48 to 72 hours after an acute ischemic stroke is not effective to prevent death or dependency.

## Therapeutic strategies in hypertensive patients with acute stroke and cerebrovascular disease - 1

Recommendations	Class	Level
In patients with acute intracerebral haemorrhage:		
• Immediate BP lowering is not recommended for patients with SBP < 220 mmHg.	III	A
• In patients with SBP ≥ 220 mmHg, careful acute BP lowering with i.v. therapy, to < 180 mmHg should be considered.	IIa	B
In acute ischaemic stroke, routine BP lowering with antihypertensive therapy is not recommended, with the exceptions:		
• In patients with acute ischaemic stroke who are eligible for i.v. thrombolysis, BP should be carefully lowered and maintained to < 180/105 mmHg for at least the first 24 h after thrombolysis.	IIa	B
• In patients with markedly elevated BP who do not receive fibrinolysis, drug therapy may be considered, based on clinical judgement, to reduce BP by 15% during the first 24 h after the stroke onset.	IIb	C



# Management of Hypertension in Patients With Acute Ischemic Stroke



**Table 19. Intravenous Antihypertensive Drugs for Treatment of Hypertensive Emergencies**

Class	Drug(s)	Usual Dose Range	Comments
CCB— dihydropyridines	Nicardipine	Initial 5 mg/h, increasing every 5 min by 2.5 mg/h to maximum 15 mg/h.	Contraindicated in advanced aortic stenosis; no dose adjustment needed for elderly.
	Clevidipine	Initial 1–2 mg/h, doubling every 90 s until BP approaches target, then increasing by less than double every 5–10 min; maximum dose 32 mg/h; maximum duration 72 h.	Contraindicated in patients with soybean, soy product, egg, and egg product allergy and in patients with defective lipid metabolism (eg, pathological hyperlipidemia, lipoid nephrosis or acute pancreatitis). Use low-end dose range for elderly patients.
Vasodilators—Nitric- oxide dependent	Sodium nitroprusside	Initial 0.3–0.5 mcg/kg/min; increase in increments of 0.5 mcg/kg/min to achieve BP target; maximum dose 10 mcg/kg/min; duration of treatment as short as possible. For infusion rates $\geq 4$ –10 mcg/kg/min or duration >30 min, thiosulfate can be coadministered to prevent cyanide toxicity.	Intra-arterial BP monitoring recommended to prevent “overshoot.” Lower dosing adjustment required for elderly. Tachyphylaxis common with extended use.  Cyanide toxicity with prolonged use can result in irreversible neurological changes and cardiac arrest.
	Nitroglycerin	Initial 5 mcg/min; increase in increments of 5 mcg/min every 3–5 min to a maximum of 20 mcg/min.	Use only in patients with acute coronary syndrome and/or acute pulmonary edema. Do not use in volume-depleted patients.



Vasodilators—direct	Hydralazine	Initial 10 mg via slow IV infusion (maximum initial dose 20 mg); repeat every 4–6 h as needed.	BP begins to decrease within 10–30 min, and the fall lasts 2–4 h. Unpredictability of response and prolonged duration of action do not make hydralazine a desirable first-line agent for acute treatment in most patients.
Adrenergic blockers—beta <sub>1</sub> receptor selective antagonist	Esmolol	Loading dose 500–1000 mcg/kg/min over 1 min followed by a 50-mcg/kg/min infusion. For additional dosing, the bolus dose is repeated and the infusion increased in 50-mcg/kg/min increments as needed to a maximum of 200 mcg/kg/min.	Contraindicated in patients with concurrent beta-blocker therapy, bradycardia, or decompensated HF. Monitor for bradycardia. May worsen HF. Higher doses may block beta <sub>2</sub> receptors and impact lung function in reactive airway disease.
Adrenergic blockers—combined alpha <sub>1</sub> and nonselective beta receptor antagonist	Labetalol	Initial 0.3–1.0-mg/kg dose (maximum 20 mg) slow IV injection every 10 min or 0.4–1.0-mg/kg/h IV infusion up to 3 mg/kg/h. Adjust rate up to total cumulative dose of 300 mg. This dose can be repeated every 4–6 h.	Contraindicated in reactive airways disease or chronic obstructive pulmonary disease. Especially useful in hyperadrenergic syndromes. May worsen HF and should not be given in patients with second- or third-degree heart block or bradycardia.

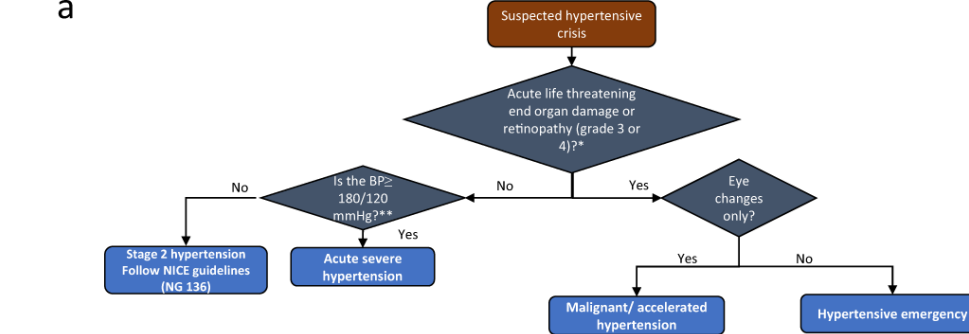
Adrenergic blockers—nonselective alpha receptor antagonist	Phentolamine	IV bolus dose 5 mg. Additional bolus doses every 10 min as needed to lower BP to target.	Used in hypertensive emergencies induced by catecholamine excess (pheochromocytoma, interactions between monamine oxidase inhibitors and other drugs or food, cocaine toxicity, amphetamine overdose, or clonidine withdrawal).
Dopamine <sub>1</sub> -receptor selective agonist	Fenoldopam	Initial 0.1–0.3 mcg/kg/min; may be increased in increments of 0.05–0.1 mcg/kg/min every 15 min until target BP is reached. Maximum infusion rate 1.6 mcg/kg/min.	Contraindicated in patients at risk of increased intraocular pressure (glaucoma) or intracranial pressure and those with sulfite allergy.
ACE inhibitor	Enalaprilat	Initial 1.25 mg over a 5-min period. Doses can be increased up to 5 mg every 6 h as needed to achieve BP target.	Contraindicated in pregnancy and should not be used in acute MI or bilateral renal artery stenosis. Mainly useful in hypertensive emergencies associated with high plasma renin activity. Dose not easily adjusted. Relatively slow onset of action (15 min) and unpredictability of BP response.



## Prognosis and follow-up

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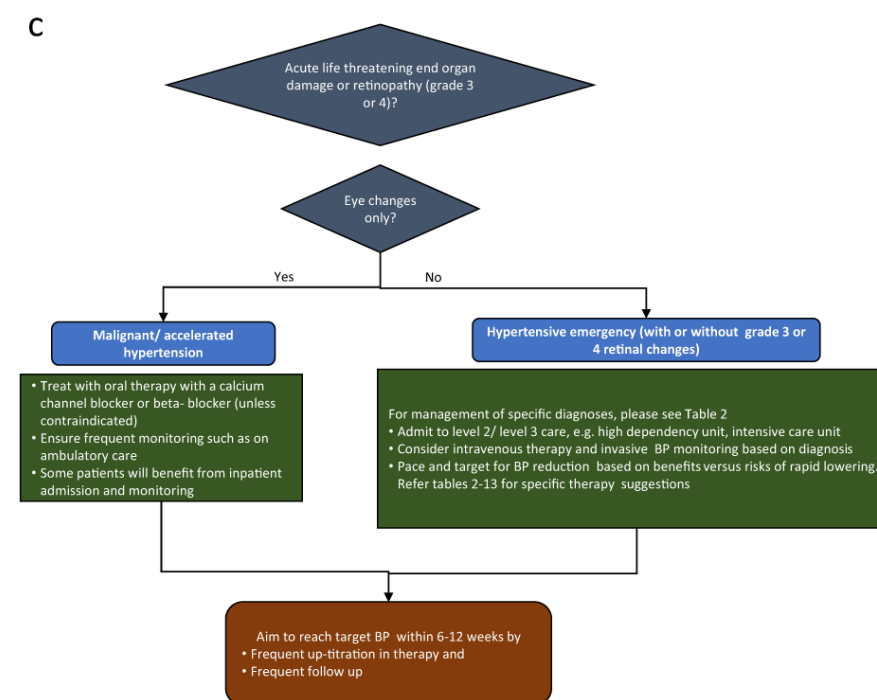
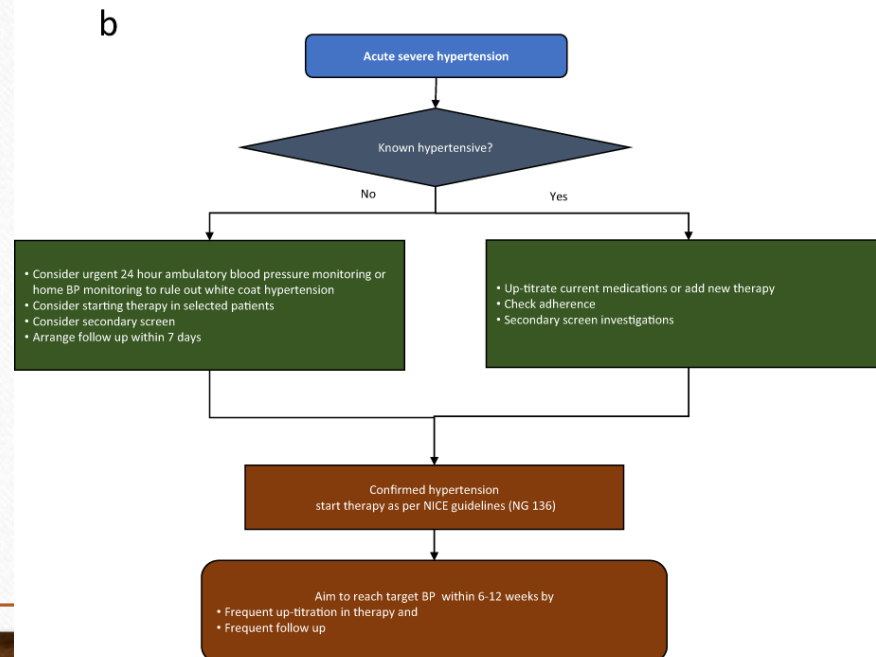
- The survival of patients with hypertension emergencies has improved dramatically over past decades, but these patients remain at high risk and should be screened for secondary hypertension
- After discharge from hospital, when BP has reached a safe and stable level on oral therapy, we recommend frequent, at least monthly, visits in a specialized setting until the optimal target BP is achieved and long-term specialist follow-up thereafter



Conditions	Definitions
Acute severe hypertension	Severe elevation in BP (usually >180/120 mmHg without evidence of acute and/or life-threatening, end organ damage (EOD))
Malignant / accelerated hypertension	A distinct pathophysiological condition. Clinically elevated BP with concurrent bilateral grade 3 or grade 4 hypertensive retinopathy
Hypertensive emergencies	Elevated BP with evidence of acute and/or life-threatening EOD

Acute life threatening EOD examples
<ul style="list-style-type: none"> <li>•Hypertensive encephalopathy Intracerebral haemorrhage, Ischaemic stroke,</li> <li>•Subarachnoid haemorrhage,</li> <li>•Acute aortic syndrome,</li> <li>•Acute coronary syndrome, Pulmonary oedema,</li> <li>•Severe preeclampsia/eclampsia,</li> <li>•Phaeochromocytoma or adrenergic crisis,</li> <li>•Acute renal failure,</li> <li>•Malignant hypertension</li> </ul>

\*Examination and Investigations (remember acute end organ damage can occur at lower BP values): Confirm hypertension – measurements in both arms using correct sized upper arm cuff. Manual BP if necessary. Repeat BP (initial resolution of pain/stress) Check pulse delays, cardiac murmurs, carotid bruit, renal artery bruit, signs of heart failure, complete neurological examination, fundoscopy, full blood count, renal function tests, bicarbonate, chest x ray, electrocardiogram, urinalysis for protein and blood (check adherence to medications, pregnancy test in relevant populations) Consider special tests including bedside echocardiogram and BNP/ NT pro BNP (if suspected heart failure), troponin if suspicious for acute coronary syndrome, CT head if any neurology, CT aorta if any chest pain suspicious for aortic pathology, urine toxicology screen for drugs of abuse. \*\*Diastolic >110 mmHg has also been considered a cut off in some guidelines. For suggestions on specific therapy please see Table1.





***Merci pour votre attention***



**Thank You**

**Any Questions**

