HYPERTENSIVE EMERGENCY

- Elevated blood pressure >180/120 without target organ damage is classified as Markedly elevated or acute severe hypertension.

- Hypertensive emergencies are defined as Systolic blood pressure > 180mmHg or diastolic pressure>120mmHg with impending or progressive organ dysfunction such as hypertensive encephalopathy, cerebral infraction, intracranial hemorrhage, acute LV failure, acute pulmonary edema, aortic dissection, renal failure or eclampsia.

- Treatment of hypertensive emergencies depends on the type of organ dysfunction.
- In most cases except for stroke, aortic dissection, pulmonary edema aim for <25% reduction of BP during initial 1 hr
    - then to < 160/100 within 2-6 hours
    - then continuously to 130 to 140 mmHg during the next 24 -48 hours to limit target organ injury.

Stroke and hypertensive emergency

- In acute ischemic stroke no need to treat unless BP >220/110 mmHg. This is because cerebral autoregulation is impaired in ischemic cerebral tissue & higher arterial pressures may be required to maintain cerebral blood flow.
- In patients with BP > 220/110 it may be reasonable to lower BP by 15% during the first 24 hours after onset of stroke to improve outcomes.

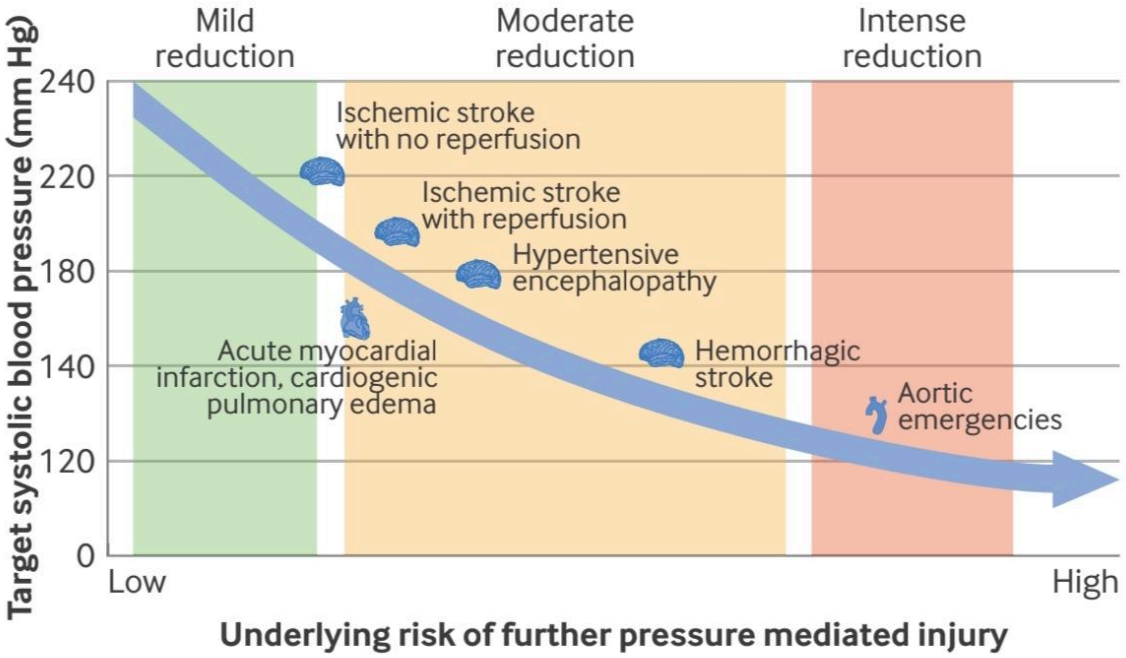
- If thrombolytics are to be given BP should be maintained at < 185/110 mmHg during treatment and < 180/105 mmHg for 24 hrs following treatment.

- AHA also states that lowering BP <140 mmHg in patients following successful reperfusion following endovascular therapy is associated with poor outcomes.

Terminology used for hypertensive emergencies, definition, and incidence at emergency departments

Terminology	Definition	Incidence*
Severe hypertension, severely or markedly elevated BP	BP >180/110 mm Hg, acute end-organ injury absent	4-6%
Hypertensive emergency:	Acute end-organ injury present due to severe hypertension. Immediate BP lowering is clinically beneficial	0.6-1.0%
Neurologic	Examples: hypertensive encephalopathy, intracerebral hemorrhage, subarachnoid hemorrhage, ischemic stroke†	—
Cardiovascular	Examples: acute heart failure, acute myocardial ischemia,† aortic dissection	—
Obstetric	Examples: pre-eclampsia, eclampsia	—
Other	Examples: acute kidney injury,† thrombotic microangiopathy,† acute moderate to severe hypertensive retinopathy	—
Acute medical emergency with associated severe hypertension	Acute end-organ injury present. Severe hypertension is not a direct cause of injury, and immediate BP lowering is not clinically beneficial	—
Unclear terminology		
Hypertensive urgency	Often used to indicate severe hypertension without acute organ injury. Assumes an unfounded treatment urgency	—
Hypertensive crisis	Indicates severe hypertension with or without acute organ injury. Assumes an unfounded treatment urgency when acute organ injury is absent	—
Malignant hypertension	Being redefined as microvascular injury with organ damage in 3 or more target organs	—

BP = blood pressure.
*Incidence based on emergency department diagnoses.
†Conditions rarely consistent with a hypertensive emergency and more likely to be an acute emergency with associated severe hypertension



Recommended intensity of blood pressure lowering target relative to the underlying risk of further pressure-mediated injury in hypertensive emergency syndromes

Treatment approaches to hypertensive emergency syndromes

Category	Initial hemodynamic targets	Agent of choice	Alternative
Aortic emergencies (aortic dissection)	SBP <120 mm Hg HR <60 bpm	Esmolol and nicardipine	Clevidipine Labetalol
Hemorrhagic stroke[68 69]	SBP 140-180 mm Hg If baseline SBP >220 mm Hg, target near 180 mm Hg	Nicardipine	Clevidipine Labetalol
Subarachnoid hemorrhage[70]	Gradual reduction if baseline SBP >180 mm Hg	Nicardipine	Clevidipine Labetalol
Ischemic stroke[71-74]	Reperfusion therapy: SBP <185 mm Hg and DBP <110 mm Hg All others: SBP <220 mm Hg and DBP <120 mm Hg	Nicardipine Labetalol	Clevidipine
Myocardial infarction, acute pulmonary edema[75]	MAP reduction by 15-25%	Nitroglycerin Labetalol Furosemide*	Esmolol Nicardipine Clevidipine
Hypertensive encephalopathy	MAP reduction by 20-25%	Nicardipine	Labetalol Clevidipine
Acute kidney injury	MAP reduction by 20-25%	Labetalol Nicardipine	Clevidipine
Pheochromocytoma or adrenergic crisis	MAP reduction by 20-25%	Phentolamine	Nicardipine Clevidipine Labetalol†

Most emergencies lack clinical trial data and are based on expert opinion, but we provide references where such data exist.
BPM = beats per minute; HR = heart rate; SBP = systolic blood pressure; DBP = diastolic blood pressure; MAP = mean arterial pressure; "reperfusion therapy" includes IV thrombolysis or endovascular therapy.
*Furosemide or budesonide indicated for decongestion and small contribution to blood pressure lowering.
†Labetalol is an option following α blockade with phentolamine.

Drug	Action	Dose	Onset &Duration of action	Comments
Nitroglycerin	Vasodilator	Start 5mcg/kg/min , then titrate every 3-5 min.	2- 5 min ; 3 – 5 min	Side effect : Headache, nausea, hypotension, bradycardia

Labetalol	Beta & alpha blocker	20 -40 mg every 10 min; Max 300mg ; 2mg/min infusion	5 – 10 min; 3 -6 hrs	Hypotension, bronchospasm, bradycardia, heart block
Esmolol	Beta blocker	Loading dose 500 mcg/kg over 1 min; maintence 25 -200 mcg/kg/min	1 -2 min; 10 -30 min	Bradycardia, nausea
Furosemide	Vasodilator	10 – 80mg	15 min; 4 hrs	Hypokalemia, hypotension
ORAL AGENTS				
Nifedipine	CCB	10 mg initially; may be repeated after 30 min	15 min	Excessive hypotension, tachyacrdia, headache, agina, mi
Clonidipine	Central sympatholytic	0.1 -0.2 mg initially; then 0.1 mg every hr to 0.8 mg	30-60 min; 6 -8 hrs	Sedation
Captopril	ACE inhibitors	12.5- 25 mg	15 -30 min; 4-6 hrs	Excessive hypotension

What is malignant hypertension ?

- It is a syndrome associated with an abrupt increase of blood pressure in a patient with underlying hypertension or related to the sudden onset of hypertension in a previously normotensive individual.
- It is characterised by progressive retinopathy, deteriorating renal function with proteinuria, microangiopathic hemolytic anemia and encephalopathy.
- The Initial goal of therapy is to reduce MAP by 20- 25 % within 1 hr, then reduce to 160/110 mmHg over 2-6 hrs.

Updated on 14/8/2025

Reference

- BMJ 2024;386:e077205. http://dx.doi.org/10.1136/bmj-2023-077205
- CMDT 2013
- ESH/ESC guidelines for arterial hypertension 2013