

Hypertensive Crisis



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Prevalence

1% to 6% of all ED patients present with 
severe hypertension

Condition may precipitate hypertensive crisis

- * Non adherence to medication
- * pregnancy (preeclampsia)
- * collagen vascular disease
- * Acute increase sympathetic activity (pheochromocytoma , drugs like amphetamines , MAO inhibitor , cocaine)
- * obesity and smoking

Blood Pressure Categories



BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Urgency VS Emergency

Hypertensive emergency : defined as  severe elevation in BP 180/120mmHG associated with evidence of new or worsening target organ damage

Hypertensive urgency : severe elevation in BP 180/120 without organ damage

Acute target organ damage

- *hypertensive encephalopathy (brain edema)
- *intracranial hemorrhage (intracerebral or subarachnoid)
- *ACS
- *Acute aortic dissection
- *Renal failure
- *Acute heart failure
- *retinopathy (hemorrhage , papilledema)

Clinical evaluation and investigation

- *Most patient complain is headache ☉
- *measure blood pressure in both arms
- *cardiovascular examination
- *neurological examination (mental status)
- *All patient should have funduscopic examination to looking for hemorrhage , papilledema

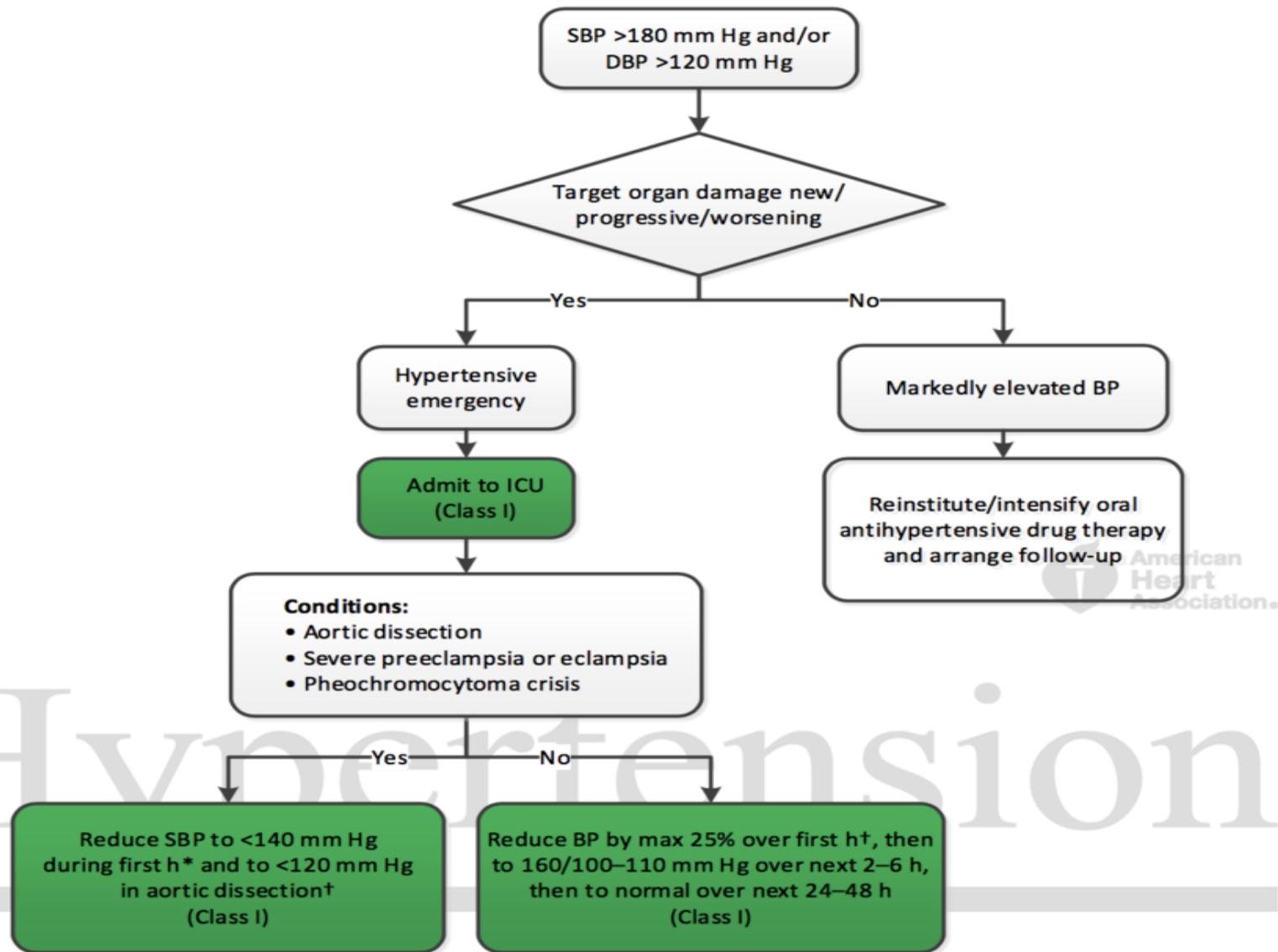
Investigation

- *ECG , CXR ◉
- *MRI , CT scan if we have any acute neurological sign
- *TTE, TOE , CT with contrast for aortic dissection
- *Laboratory evaluation (CBC, urea , creatinine , electrolytes , Ck-mB , troponine)
- *Urinalysis (protinuria , RBC cell and RBC casts)
- *Pregnancy test in women of child-bearing age

Hypertensive Crises: Emergencies and Urgencies

COR	LOE	Recommendations for Hypertensive Crises and Emergencies
I	B-NR	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.
I	C-EO	For adults with a compelling condition (i.e., 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	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.

Figure 11. Diagnosis and Management of a Hypertensive Crisis



Colors correspond to Class of Recommendation in Table 1.

*Use drug(s) specified in Table 19.

†If other comorbidities are present, select a drug specified in Table 20.

BP indicates blood pressure; DBP, diastolic blood pressure; ICU, intensive care unit; and SBP, systolic blood pressure.

Nitroprusside Sodium

- * Dilate both arterioles and veins by \odot increase NO and induce vasodilation
 - * Dose : 0.3-0.5 mcg/kg/min increase by increment of 0.5 mcg/kg/min to achieve BP
 - * maximum dose 10 mcg/kg/min
 - * onset of action during 1-2 min and loss efficiency after 10 min from stopping
 - * side effect : cyanid toxicity with prolonged use, increase dose , renal and hepatic impairment
- Antidote : NA thiosulfate

Labetalol

- *Alpha 1 and nonselective beta adrenergic antagonist 
- *Dose : 0.3-1 mg/kg
- *Onset of action 5-10 min
- *Duration of action : 3-6 hours
- *Especially useful in aortic dissection and preeclampsia
- *Contraindication : bradycardia , second and third degree AV block , may worsen HF

Nitroglycerine

*increase NO and prostaglandine E2,I2 

*Dose 5mcg/min and increase 5
mcg/min erery 3-5 min tim maximum
20mcg/min

Other agents

*CCB dihydropyridine (nicardipine ,  clevidipine)

*Direct Vasodilator (hydralazine)

*Dopamin 1 receptor selective agonist (fenoldopam) preferred in renal failure

*Beta blocker (esmolol)

Table 3 | Hypertensive emergencies requiring immediate blood pressure lowering with intravenous drug therapy

Clinical presentation	Timeline 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	Immediately 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 sulfate	Consider delivery

MAP = blood pressure; bpm = beats per min; DBP = diastolic blood pressure; HELLP = haemolysis, elevated liver enzymes, and low platelets; i.v. = intravenous; MAP = mean arterial pressure; SBP = systolic blood pressure.

