



HYPERTENSION IN ER

To manage high BP in ER and casualty, follow these steps:

Step 1: Measure Blood Pressure and Classify!!

- If BP is high $\geq 140/90$ but doesn't exceed $180/110$, it doesn't belong to Emergencies at all, you have to refer him to be controlled at outpatient clinic

- While If BP is $\geq 180/110$ it is called "Hypertensive Crises"

- There are two types of Hypertensive Crises:



How to differentiate between both types?

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HYPERTENSIVE EMERGENCY

BP $\geq 180/120$ + evidence of Acute **TARGET ORGAN DAMAGE {TOD}**; one or more of such complications

Acute TOD

◆ Brain 🧠

- Intracerebral hemorrhage
- Ischemic Infarction
- Hypertensive encephalopathy

◆ Heart and Great vessels 🫀

- Acute Pulmonary edema (Acute Left side heart failure)
- Acute coronary Syndromes (ACS including STEMI, NSTEMI and UA)
- Aortic dissection

◆ Kidneys

- Acute kidney injury (not frequent)

◆ Retina

- Hypertensive retinopathy (grade III & grade IV) you must do fundus examination

◆ Pregnant female with Eclampsia /Preeclampsia



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HYPERTENSIVE URGENCY

BP \geq 180/120 **without** evidence of Acute **TARGET ORGAN DAMAGE {TOD}** So, the patient might be either

- Asymptomatic Or
- The patient might have some symptoms like headache, dizziness, palpitation and sometimes Epistaxis

Step 2: Ask about symptoms of All Target organs damage!!

1

BRAIN

Intracerebral hemorrhage

1 Ask about:

- Sudden Headache
- Sudden onset of lateralization (focal neurological deficit; e.g weakness affecting one side \pm facial palsy then rapid deterioration in conscious level).

2 **Confirm the diagnosis** by **RAPID NEUROLOGICAL EXAMINATION** (give particular attention to GCS **+** eye pupils {unequal pupils} **+** Features of UMNL in shock stage **+** Babinski sign).

3 Next step

- **Initial CT brain** (hyperdense area (fresh blood inside the brain), it will appear at once in comparison to cerebral infarction).

Ischemic Infarction

1 Ask about:

- Sudden onset of lateralization (focal neurological deficit; e.g weakness affecting one side \pm facial palsy \pm speech problem)

2 Simple Mnemonic for ischemic stroke \rightarrow BEFAST

- **B** = balance disorder
- **E** = Eye problem (vision or gaze)
- **F** = Face (drooping of the angle of the mouth)
- **A** = Arm weakness
- **S** = Speech disorder (Aphasia; expressive or receptive, or dysarthria & slurred speech)
- **T** = Time of symptoms' onset

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HYPERTENSION



3 Confirm the diagnosis by RAPID NEUROLOGICAL EXAMINATION

- Features of UMNL in affected side (hemiplegia) but in shock stage ± Babinski sign) ± UMNL facial palsy ± hemisensory loss)

4 Next step:

- **CT brain** (CT brain would be normal in the first 24 - 48 hrs symptoms onset) but you will depend on history and examination in diagnosis!! But after 28 hrs → hypodense regions will appear (e.g. parietal, temporal, occipital etc.).

Hypertensive encephalopathy

1 Ask about:

- Headache
- Seizures
- Disturbed conscious level, but WITHOUT LATERALIZATION!!

2 Confirm your diagnosis

- AFTER EXCLUSION OF LATERALIZATION BY CLINICAL EXAMINATION (IMPORTANT)
- Along with DEDSIDE FUNDUS EXAMINATION LOOKING FOR PAPILLEDMA

3 Next step:

- **CT brain** just for exclusion of hemorrhage and infarction (it will appear normal except some brain edema that will appear in some cases)

Clinical Note

There is a special condition called **PRES {Posterior reversible encephalopathy syndrome}** which is so similar to hypertensive encephalopathy but the patient mainly has other features e.g. **visual disturbances up to transient loss of vision along with SUDDEN SEVERE HEADACHE ± SEIZURES.**

- IN SUCH case, you must do **MRI brain** looking for focal vasogenic edema in posterior regions in the brain (occipital or occipito-parietal regions).

2

HEART AND GREAT VESSELS

Acute Pulmonary edema (Acute Left side heart failure)

1 Ask about

- Sudden onset of DYSPNEA associated with MARKED TACHYPNEA AND RESPIRATORY DISTRESS



2 Confirm your diagnosis by

- Auscultation of both lung fields (you would hear bilateral inspiratory crackles) **+**
- Give special attention to \uparrow JVP **+**
- Check SPO₂ for HYPOXEMIA; \downarrow Bed side O₂ saturation) and NOTE MARKED TACHYPNEA AND ORTHOPNEA

3 Next step:

- **Initial CXR** LOOKING FOR BATWING APPEARANCE AND CARDIOMEGALY \pm ECHO **+** ABG)

Acute coronary Syndromes (ACS including STEMI, NSTEMI and UA)

1 Ask about typical chest pain as described before

2 Examine the patient and auscultate the heart for Any findings e.g murmurs

3 Next step:

- ECG, troponin in NSTEMI-ACS
- \pm Bedside Transthoracic ECHO.

Aortic dissection

1 Ask about chest pain criteria typical for Aortic dissection (severe knife like pain referred to interscapular area)

2 Confirm the diagnosis by checking radial pulse bilaterally (you will find UNEQUAL PULSE) then auscultate the heart and the back

3 Next step is:

- **Bedside ECG** for exclusion of STEMI then do CT AORTOGRAM [AORTOGRAPHY] [CT aortic angiography]

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KIDNEYS

Acute kidney injury

1 Ask about:

- Reduced urine output (oliguria) **+**
- Recent elevation of Creatinine in relation to elevated BP!!

2 Confirm the diagnosis by examination for signs of fluid overload (e g bilateral LL edema \pm signs of pulmonary edema!!

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HYPERTENSION



3 Next step:

- Bedside Renal function tests (urea & creatinine) +
- ABG & electrolytes (Na, K, Calcium & Phosphorus)
- → Check for microscopic hematuria in urine analysis

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RETINA

Hypertensive Retinopathy

- You can only detect it by bedside fundus examination looking for grade III & grade IV.

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PREGNANT FEMALE WITH ECLAMPSIA /PREECLAMPSIA

- **BP would \geq 160/100 - 105**

Ask about

- History of previously diagnosed pre-eclampsia in a pregnant woman at the third trimester +
- Consultation of Gynecologist.

Step 3: Manage

A

MANAGEMENT OF HYPERTENSIVE URGENCY

- 1 **No need for admission** (admission at ward is optional) + reassurance of the patient
- 2 **Give him oral agents only**

- **Example:** oral Capoten 25 - 50 mg once

⚠ Don't give the patient Sublingual Capoten or Sublingual Epilat (🚫)

- If such agents are used there would be risk of stroke or MI because of sudden reduction in BP!!

⚠ Didn't give the patient IV Lasix

Target 🎯

- Reduction of BP just below 180/120 in hours (6 hours) then optimize his treatment (oral combination; dual or triple agents) to decrease BP to \sim 140/90 over 24 hours or refer to outpatient clinic.



Clinical Note

If BP < 180/120, there is no emergency at all, just optimize the treatment or refer to outpatient clinic.

B

MANAGEMENT OF HYPERTENSIVE EMERGENCY

= ICU admission + IV agents

1. Management of high BP in Intracerebral hemorrhage

- ❖ If Systolic BP ranges between 150 - 220 mmHg → reduce SBP over 2 - 6 hrs to the target SBP: 140 mmHg not more!!
- ❖ While if Systolic BP > 220 mmHg → Reduce SBP to around 160/100 over the first 6 hours then 140/90 later

IV AGENTS

1. Na nitroprusside (Nipride) 50 mg

Dose:

- 0.3 - 10 mcg/kg/min → 1.5 ml/hour up to 45 mg with up titration according to BP

3. Labetalol (Trandate or Labipress) 5mg

Dose:

- 20 mg bolus then 1mg/min Or
- 20 mg bolus then every 10 min give 20 mg up to 300 mg

3. Nitroglycerine (Tridil or Nitronal)

Dose: 45 - 200 mcg/min → 3 - 15 ml/hour



2. Management of high BP in cerebral infarction

- ❖ If BP < 220/120, no anti-hypertensive TTT in the first stage (first 48 - 72 hrs) unless the patient needs IV thrombolytic therapy, BP must be reduced to below 180/110.

Note: after 2-3 days high BP will often need oral agents (combination dual or triple) e.g. Exforge 5/160/12.5

- ❖ While If BP ≥ 220/120 mmHg, give IV agents.

IV agents: The same drugs as mentioned above with the same doses

- Target reduction 25 % of MAP in the first 6 hours then reduce BP gradually



3. Management of high BP in hypertensive encephalopathy

IV AGENTS

Phentolamine (Rogitamine) 10 mg

Dose:

- 10 mg bolus then repeat every 2 - 4 hrs **Or** 10 mg bolus then 1 mg/hour Or

Other IV agents as mentioned above in ICH (Na nitroprusside or Labetalol or Nitroglycerine)



4. Management of high BP in Aortic dissection

IV AGENTS

Na nitroprusside (Dose: see above) Or Labetalol (Dose: see above)

Tridil infusion (Nitronal)

Dose: see above



🎯 **Target of BP reduction to SBP < 120 and HR < 60**

- Then if Aortic dissection of Stanford A type → Urgent Surgical interference

❖ **While If Stanford B** → just control BP as before, surgery indicated in some situations

5. Management of high BP in Acute Coronary Syndromes

IV agents ✍

- Tridil or (Nitronal)
- **Dose:** mentioned before

6. Management of high BP in Acute pulmonary edema

IV AGENTS

✍ IV Tridil (Nitronal), dose mentioned before +

✍ IV Lasix

- **Dose:** 40 mg IV direct then report every 15 - 30 minutes if needed up to 120 mg



Target: 15 - 25 % of MAP in the first 6 hours



7. Management of high BP in pre-eclampsia & Eclampsia

IV AGENTS

Labetalol (Labipress), Dose mentioned before

If associated seizures (Eclampsia):

- Give **IV Magnesium sulfate** 2 gm infusion over 30 minutes



8. Management of high BP in Acute Kidney Injury

IV AGENTS

- **Na nitroprusside** (dose mentioned) Or **Labetalol** (dose mentioned)
- Fluid balance & fluid chart



Management of Epistaxis with high BP (Hypertensive Urgency)

- **Nasal pack** (ENT consultation) +
- **Oral Capoten 25 mg tab** with gradual BP reduction,
- Consider another oral tab within 2 - 6 hrs in order to reduce BP to around 160/10.

