

How to Manage High Blood Pressure in Hospitalized Patients

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Have in mind two examples

- An asymptomatic patient on vacation who forgot his medicines and he doesn't recall their names, came with BP of 210/115 and HR 96
- A well dressed guy comes with chest pain , elevated BP and HR, he doesn't say he did cocaine and actually he teared his aorta

Outline

- Definition
- Asymptomatic high BP
 - Chronic hypertension
 - Acute illness
 - Procedure
- Symptomatic high BP
 - Hypertension Urgency
 - Hypertension Emergency
- Summary – practical algorithm



Definition

- No definition
- Intuitive definition (180/110? 220/130?)
- Not chronic Grade 3 HTN !!!
- Increase in DBP to >115 mmHg
- DBP $> 120-130$

Initial assessment

- History
 - Duration of HTN
 - Medications
 - Co-morbidities
 - TOD
- Physical examination
 - Proper BP measurement
 - Signs of TOD
 - Signs of secondary HTN
- Laboratory
 - Chemistry
 - Urinalysis
 - ECG
- Details related to present episode



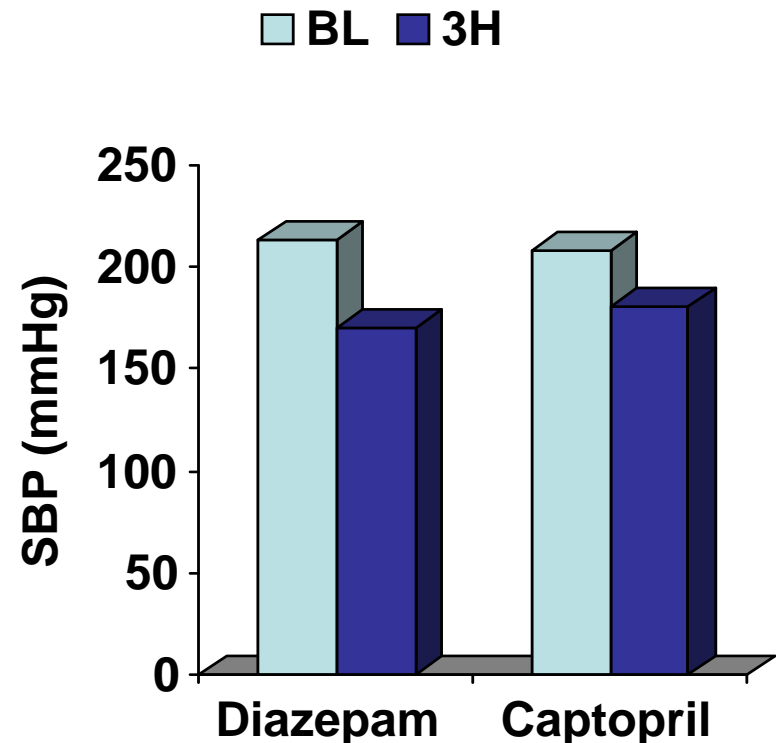
Asymptomatic high BP: Chronic hypertension

- Should be discharged
- Schedule a work up for resistant and/or secondary hypertension

- 117 subjects
- DBP 116-139
- Randomly assigned:
 - Repeated doses of clonidine
 - Repeated dose of placebo
 - Discharge
- No difference in BP in 1 day or 1 week
- No difference in major outcome at 3 month

Antianxiety treatment in patients with excessive hypertension

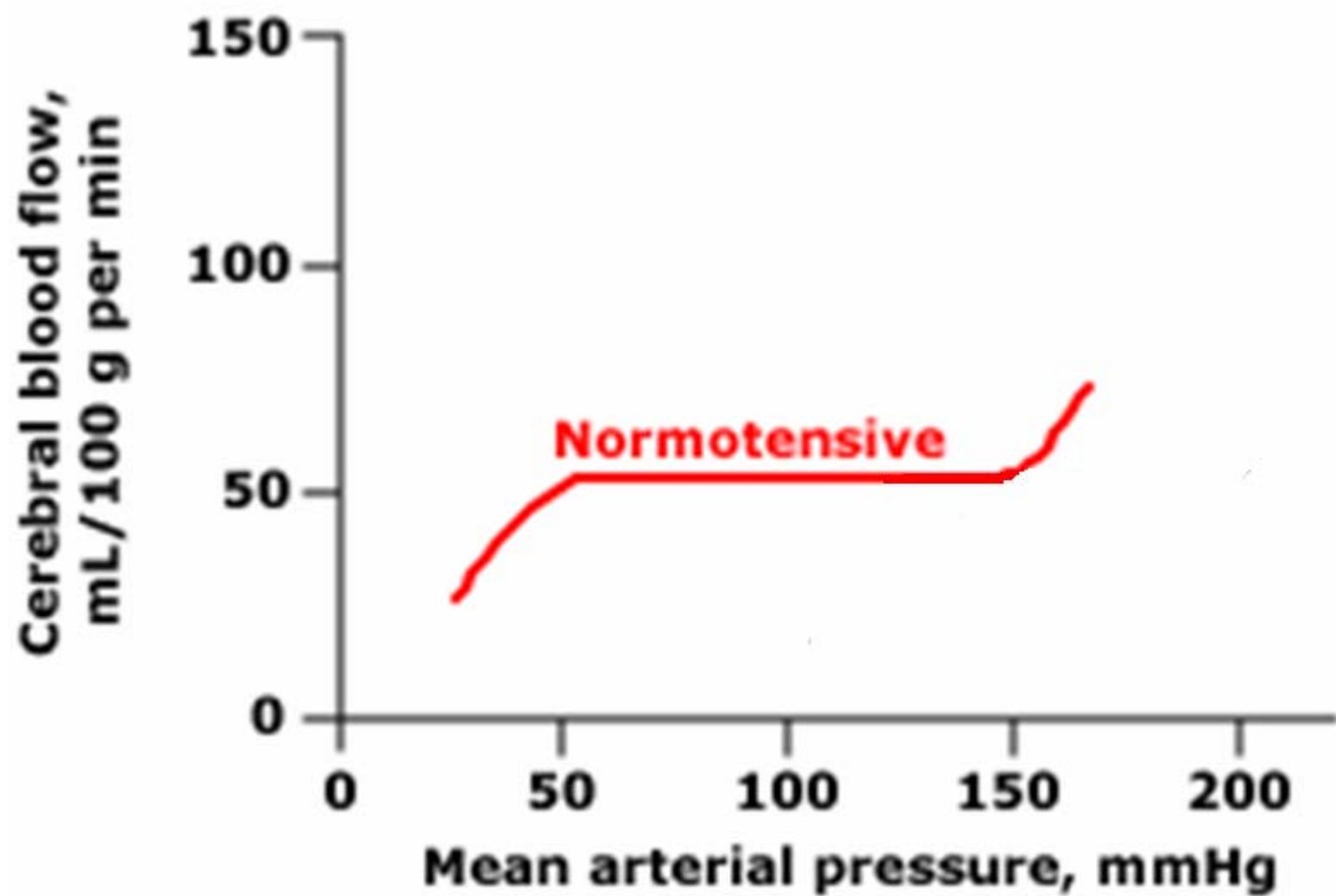
- 36 patients, 60 +/- 2 years
- excessive hypertension (>190/100 mm Hg)
- randomized to either oral diazepam, 5 mg or sublingual captopril, 25 mg

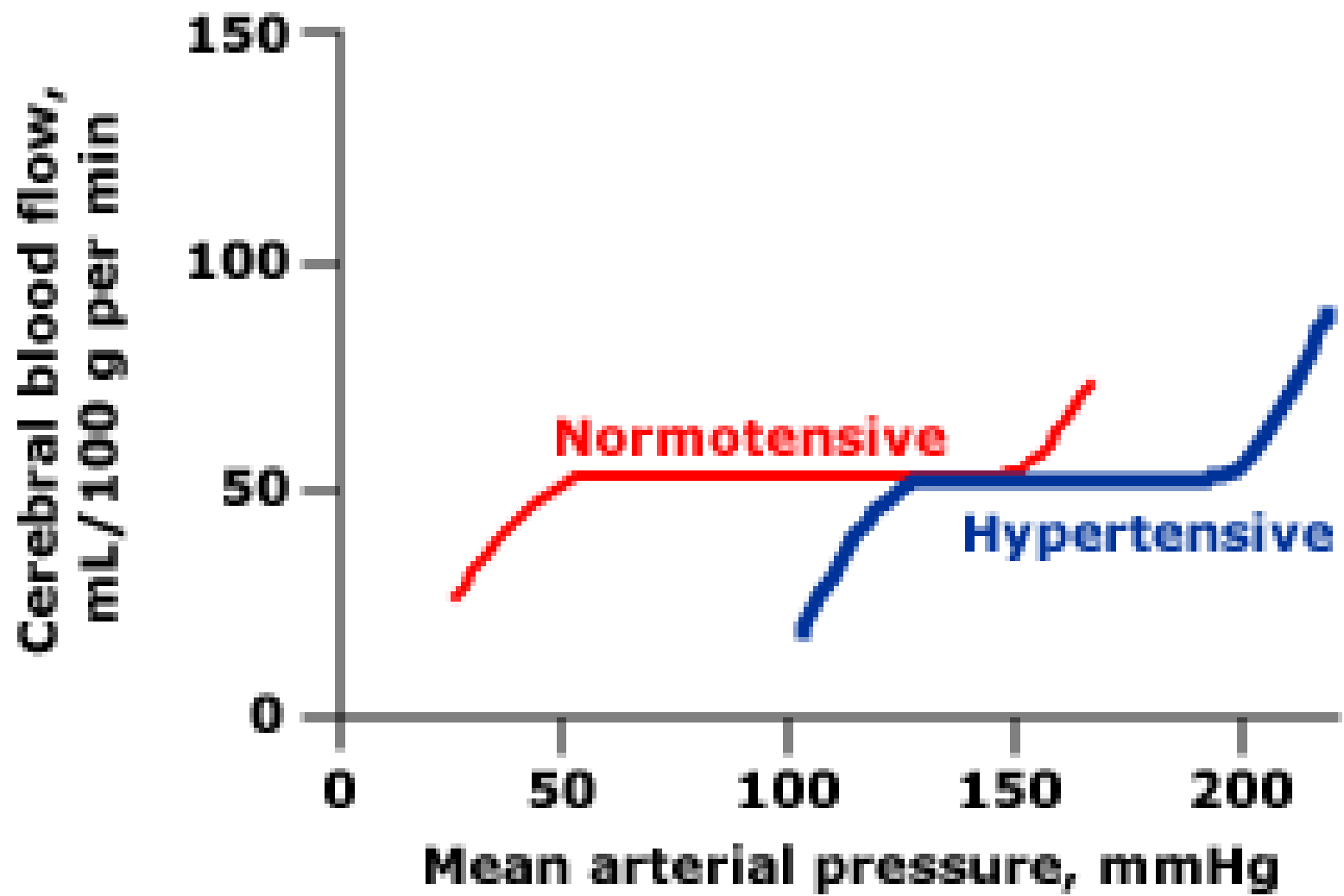




Rapid reduction may be harmful !

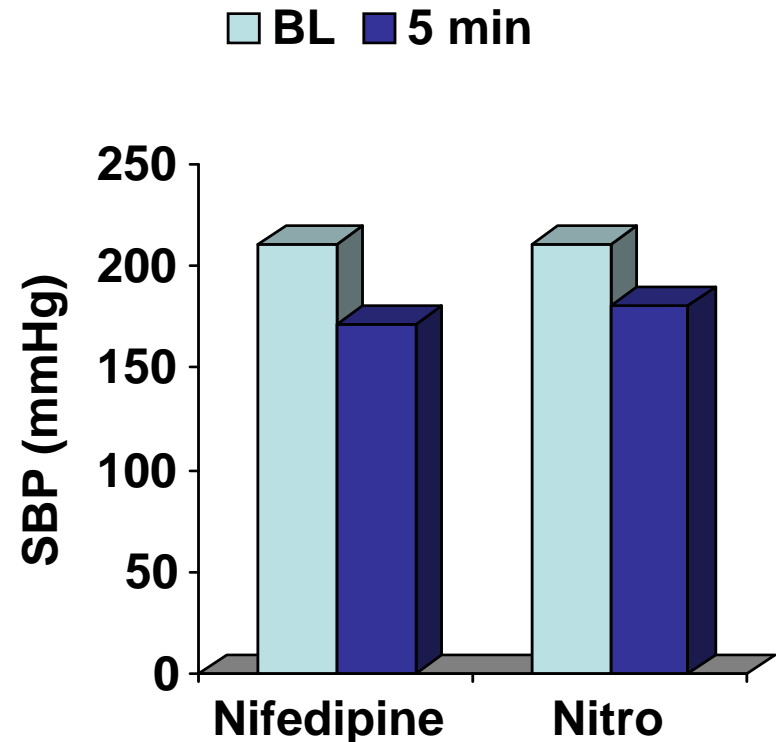
- Should a moratorium be placed on sublingual nifedipine?
 - Series of cases with fatal or near fatal events
 - SL absorption is poor and unpredictable





Comparison of nitroglycerin with nifedipine in patients with hypertensive crisis

- 20 patients
- excessive hypertension
- randomized to either SL nifedipine or SL nitroglycerin





Asymptomatic high BP: Acute illness

- Non-hypertensive
 - Stress related
 - Reassurance
 - Repeat BP measurements after discharge
- Chronic HTN hospitalized for non reno-cardio-vascular condition
 - A good chance to review the treatment
 - In high risk patients – adjust treatment




Asymptomatic high BP: Acute illness

- Chronic HTN hospitalized for reno-cardio-vascular condition
 - **Update** the treatment according to condition
 - IHD - BB
 - CHF - RAS, loop diuretics, spironolactone, BB
 - CVA - ACE, CCB, diuretics, clonidine
 - CRF - RAS, loop diuretics

Asymptomatic high BP: procedures

- Vascular procedures
 - <200
- Anesthesia
 - <180/110
 - If stress is evident (HR) - use BB / labetalol
- Post surgery
 - Pain control
 - labetalol or short acting BB



Symptomatic high BP: Hypertension Urgency

- Severe symptomatic hypertension
- TOD - not deteriorating
- Precipitating factor!
- Oral treatment, if needed -
 - Captopril
 - Clonidine
 - Labetalol
 - Fusid

Symptomatic high BP: Hypertension Emergency

- Acute MI
- Pulmonary Edema
- Cerebral Ischemia or Hemorrhage
- Encephalopathy
- Aortic dissection
- Progressive renal failure

Hypertension

**Fibrinoid Necrosis
of Arterioles**

**Endothelial
Dysfunction**

**Pathophysiology
of Hypertensive
Crisis**

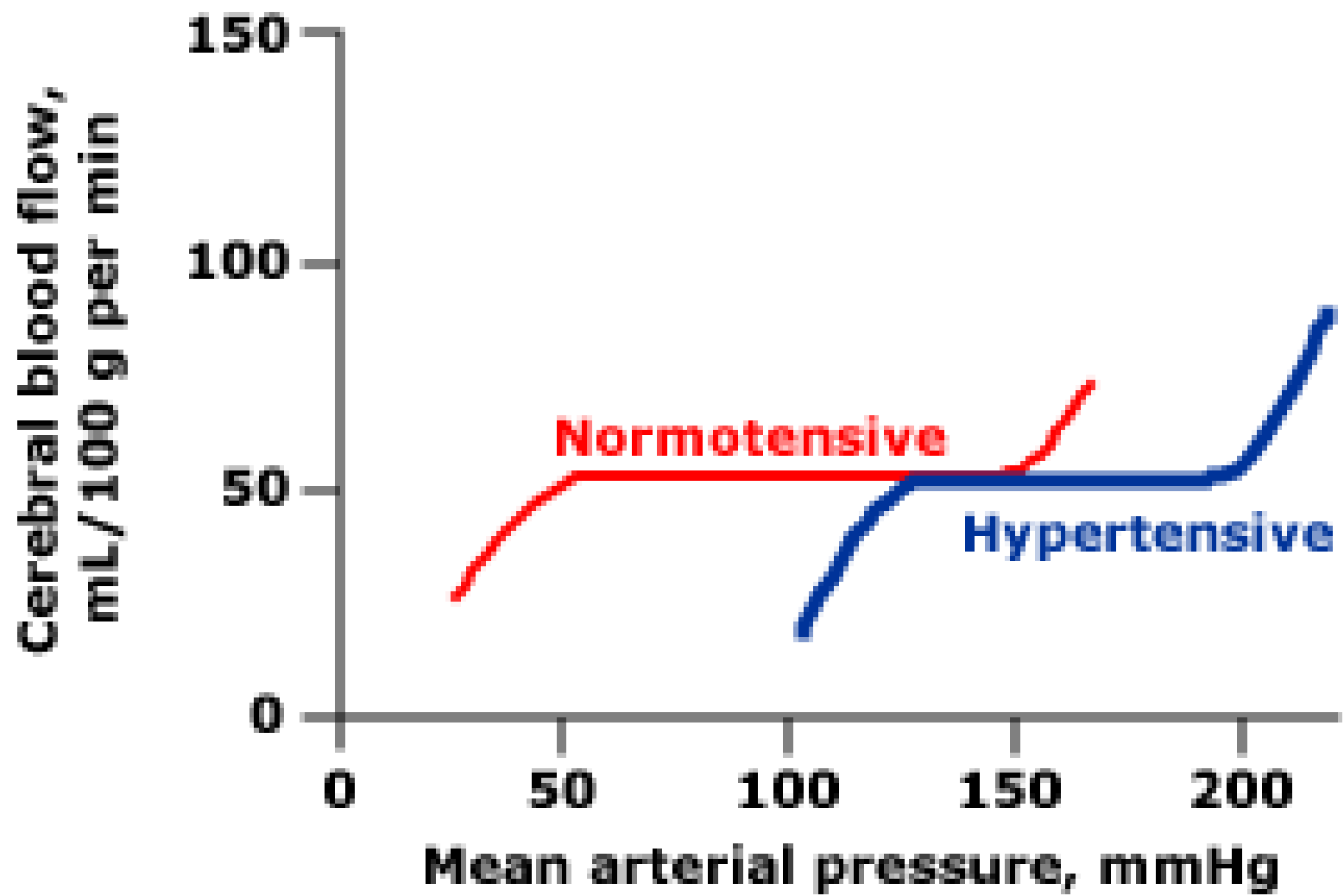
**Impaired
Production of
NO and Endothelin**

**More
Vasoconstriction**

**Renal Ischemia
Release of Renin**

**Vasoconstriction and
Aldosterone
Stimulation Increase
Positive Feedback**

**Formation of
Angotensin II**



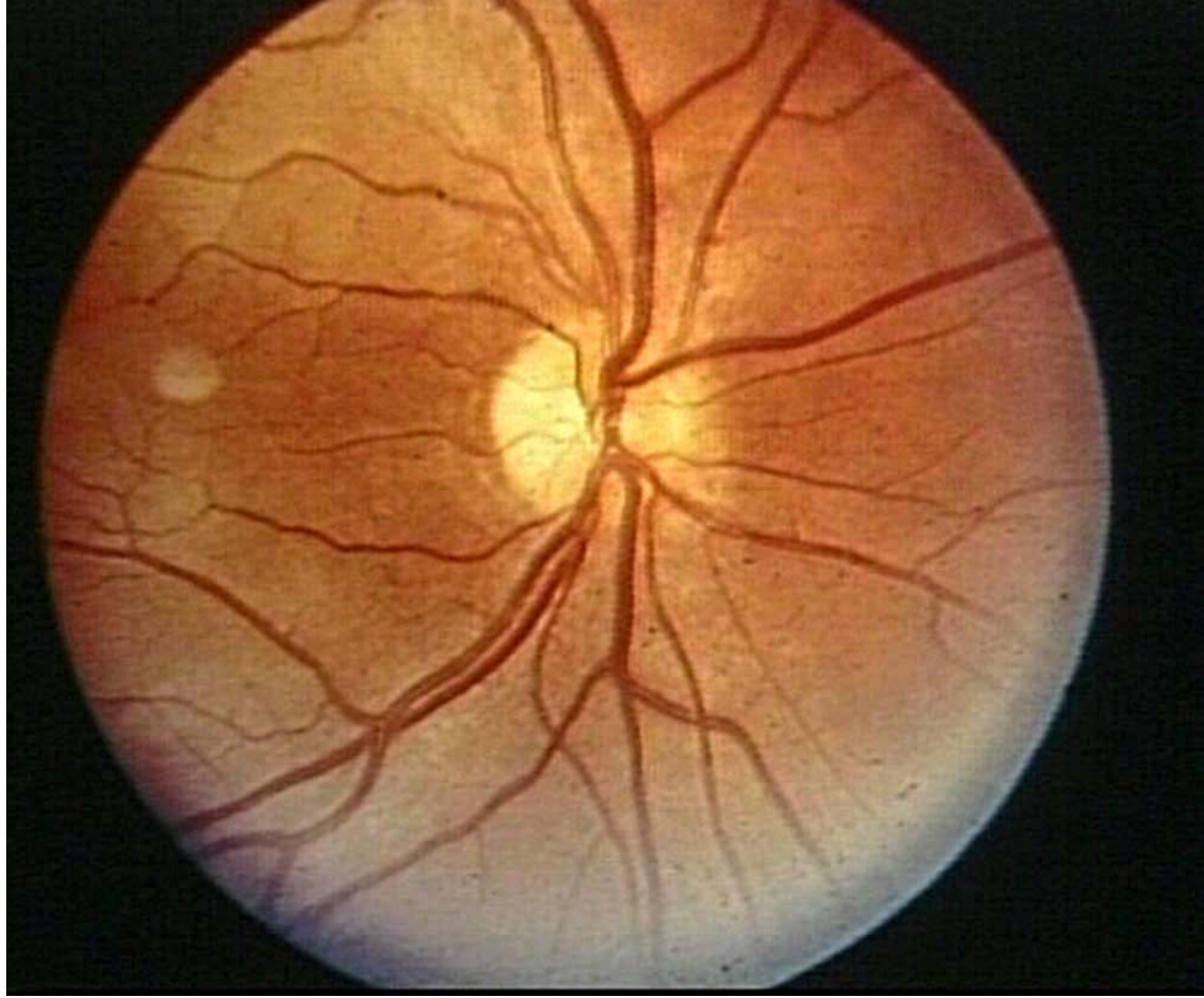


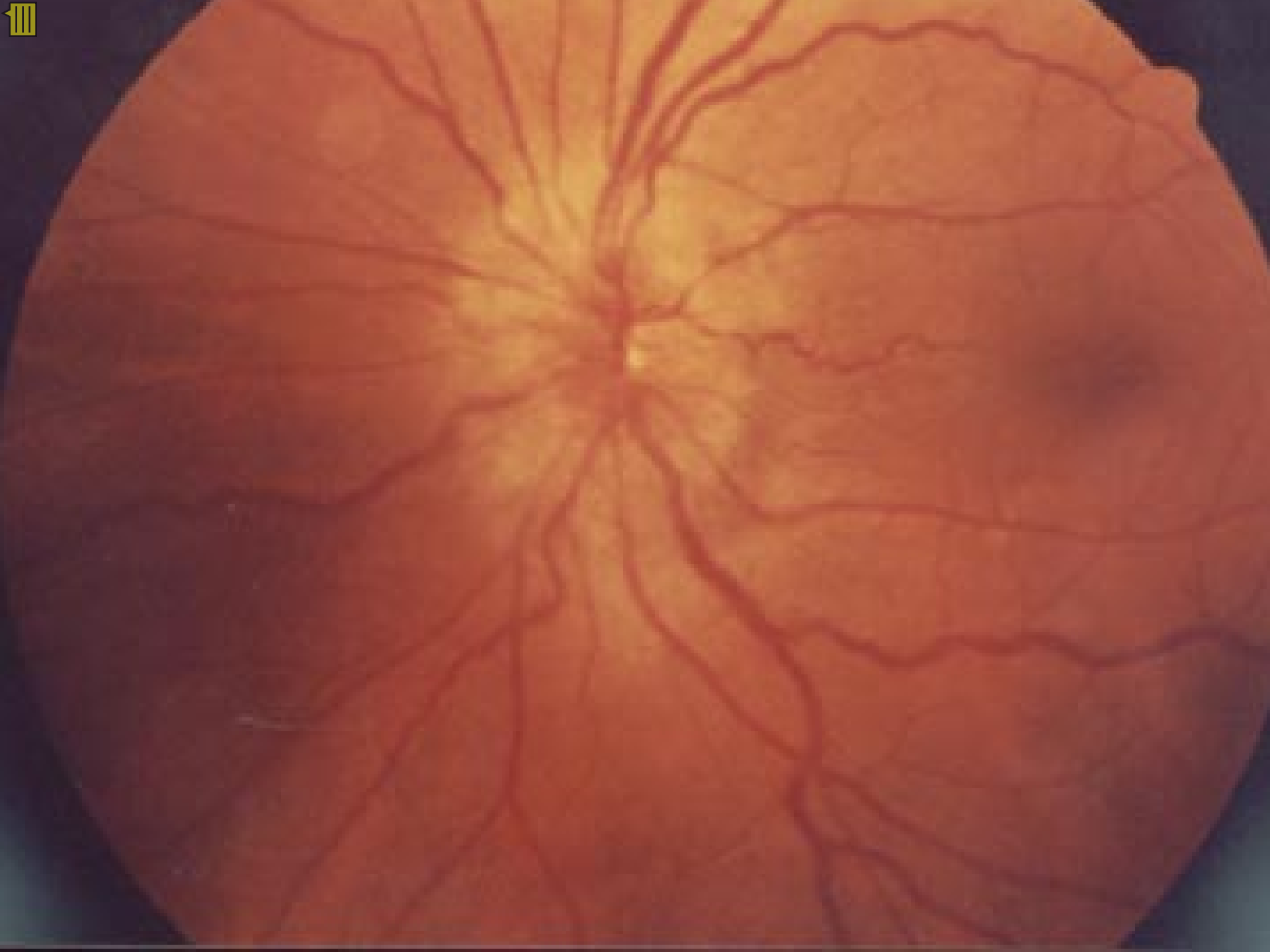
Hypertensive emergency - Characteristics

- $>220/140$
- Fundus: Hemorrhage, exudates, papilledema
- Neurologic status: Headache, somnolence, stupor, visual loss, seizures, coma
- Cardiac signs: prominent apex, enlargement, CHF
- Renal signs: Azotemia, proteinuria, oliguria
- GI: nausea, vomiting

Approach

- Hx: medications, illicit drugs
- Physical examination (fundus)





- Goal – to restore tissue perfusion and NOT to correct BP per se
- Target BP – 25% reduction of MAP within 2-4 hours
- 160/90 within 48-72 hours

Specific conditions:

- CVA-if at all, 15% in 24 hours
- Thrombolytic therapy -
BP<185/105mmHg
- ICH-BP<200/110



Treatment

- Frequent BP monitoring
- Initial blood and urine sample
- Immediate parenteral therapy
- Treatment of choice:
 - No comparative studies
 - According to clinical set-up
 - Fusid

Medications in Emergency HTN

Drug			
Nitroprusside			
Nitroglycerine			
Labetalol			
Phentolamine			
Esmolol			



Medications in Emergency HTN

Drug	mechanism	Dose	precautions
Nitroprusside	Veno+arte. Dilator	0.5-2 μ g/kg/min	Cyanide ICP



Medications in Emergency HTN

Drug	mechanism	Dose	precautions
Nitroglycerine	Vasodilator	5 μg/min	Headache tachyphylaxis \uparrow ICP



Medications in Emergency HTN

Drug	mechanism	Dose	precautions
Labetalol	$\alpha + \beta$ blocker	20 mg \rightarrow 80mg 2mg/min	Asthma CHF, AV block



Medications in Emergency HTN

Drug	mechanism	Dose	precautions
Phentolamine	α blocker	1-5 mg	tachycardia

Medications in Emergency HTN

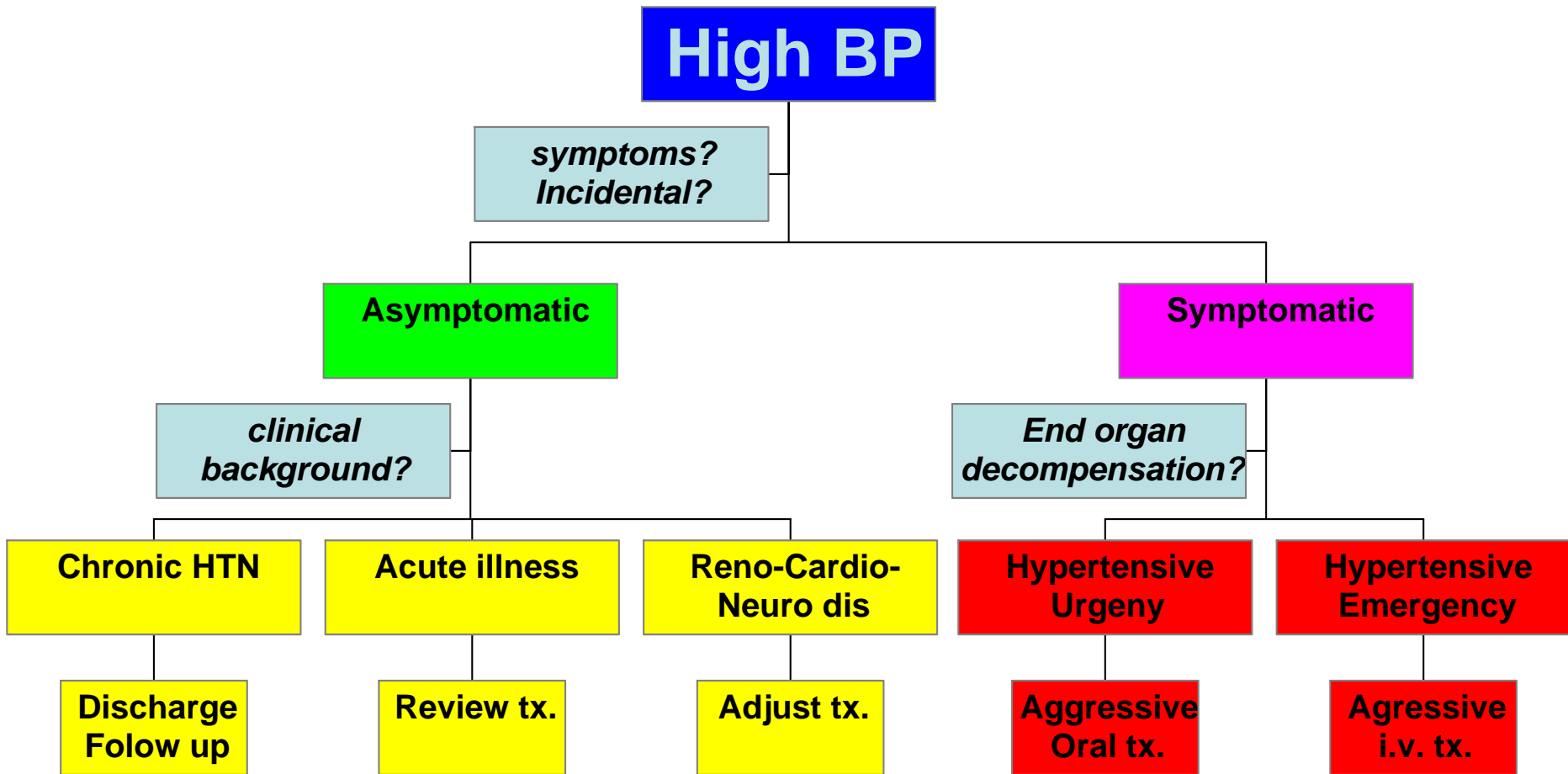
Drug	mechanism	Dose	precautions
Esmolol	β blocker	0.5 mg/kg/ bolus 50 μ g/kg /min >300 μ g/kg /min	Asthma, CHF, AV block

Summary: Excessively High BP

	Uncontrolled Blood Pressure	Hypertensive Urgency	Hypertensive Emergency
BP (mmHg)	>180/100	>180/110	Usually >220/140
Symptoms	Headache, anxiety, asymptomatic	Severe headache, shortness of breath, edema, epistaxis	Shortness of breath, chest pain, nocturia, dysarthria, weakness, altered consciousness

	Uncontrolled Blood Pressure	Hypertensive Urgency	Hypertensive Emergency
Exam	No target organ damage, no clinical cardiovascular disease	Target organ damage, clinical cardiovascular disease present/stable	Encephalopathy, pulmonary edema, renal insufficiency, cerebrovascular accident, cardiac ischemia
Therapy	Observe 1–3 hours, initiate/resume medication, increase dosage of inadequate agent	Observe 3–6 hours, lower BP with short-acting oral agent, adjust current therapy	Baseline labs, IV line, monitor BP, initiate parenteral therapy, ICU, additional diagnostic tests

Algorithm



Arrange follow-up!

Thank you for your attention