

HTN emergencies, definition, management

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Definitions

- ▶ **Severe hypertension:**
- ▶ in both children and adolescents
- ▶ stage 2 hypertension
- ▶ blood pressure substantially >99th percentile for age, sex, and height percentile
- ▶ frequently *a secondary underlying cause* of their hypertension in children
- ▶ Needs to prompt evaluation and treatment



Subgroups, Maybe!

- ▶ **Hypertensive emergencies**
- ▶ In pediatric patients
- ▶ often accompanied by *hypertensive encephalopathy* and *possibly seizures*
- ▶ should be treated with an *intravenous infusion medication*
- ▶ It is recommended that the blood pressure be lowered by $\leq 25\%$ in the first 8 hours with normalization over a 24- to 48-hour period



- ▶ **Hypertensive urgencies**
- ▶ occur with *less elevation of blood pressure* and *less serious symptoms*
- ▶ may include *severe headache* and *vomiting*
- ▶ can be treated with either oral or intravenous antihypertensive agents
- ▶ depend on the level of blood pressure and symptoms present



Symptoms and signs in more details

- ▶ **Hypertensive emergencies :**
- ▶ **In adults:** usually with known and often severe preexisting HTN
- ▶ **In children:** typically at the time of presentation with symptomatic HTN
- ▶ The severity of manifestations :
 - 1- chronicity of HTN 2- on the magnitude of the BP elevation

Children with cardiac outlet obstruction or cardiomyopathy may become symptomatic despite mild HTN

The most common symptoms in the majority of older children who present to the emergency department → hypertensive encephalopathy



Hypertensive encephalopathy

- ▶ headache,
- ▶ nausea, vomiting,
- ▶ mental confusion,
- ▶ blurred vision,
- ▶ agitation, or
- ▶ frank seizures
- ▶ cerebral infarction,
- ▶ intercerebral or retinal hemorrhage,
- ▶ congestive heart failure,
- ▶ acute pulmonary edema (and shortness of breath),
- ▶ acute kidney injury, or microangiopathic hemolytic anemia



Uncommon sequelae of hypertensive emergencies

- ▶ **In children:**

- ▶ myocardial infarction
- ▶ aortic dissection

- ▶ **In newborns and infants:**

- ▶ congestive heart failure
- ▶ hypertensive retinopathy
- ▶ respiratory distress, apnea or cyanosis
- ▶ extreme irritability
- ▶ Hypotonia
- ▶ convulsions, or coma
- ▶ *Vomiting or diarrhea as well as failure to thrive may be among the global chronic manifestations of HTN in this younger age group.*



► Renal disorders

-----→ no?

→ previously unrecognized *cardiac and endocrinologic* etiologies of HTN



Table 13 Age-specific common etiologies of severe HTN

Age range	Common etiologies
Neonates	Renovascular disease
	Thrombi in renal artery or vein
	Renal artery stenosis
	Coarctation of aorta
	Autosomal recessive polycystic kidney disease
	Renal parenchymal disease
	Caffeine overdose
Children	Renal parenchymal disease
	Acute glomerulonephritis
	Hemolytic uremic syndrome
	Reflux nephropathy
	Renovascular disease
	Coarctation of aorta
	Neuroendocrine tumors
Adolescents	Similar to children, in addition:
	Substance abuse
	Cocaine
	Amphetamines
	Preeclampsia
	Drug overdose
	Pseudoephedrine
	Phenylpropanolamine
Nonsteroidal anti-inflammatory drugs	



Antihypertensive Drugs for Management of Severe Hypertension in Children

drug	class	Recommended dose	route	comments
Esmolol	Beta blocker	100- 500 micro/kg/min	IV infusion	Very short acting, Constant infusion, Profound bradycardia
Hydralazine	Vasodilator	0.2-0.6 mg/kg/dose	IV/IM	Should be given q4h when given IV bolus
Labetalol	α - and β - blockers	Bolus: 0.2- 1.0 mg/kg/dose up to 40	IV bolus or infusion	Asthma and overt heart failure are relative contraindications
Nicardipine	Calcium channel blocker	1-3 μ g/kg/min	IV infusion	May cause reflex tachycardia



Sodium nitroprusside	Vasodilator	0.53-10 $\mu\text{g}/\text{kg}/\text{min}$	IV infusion	Monitor cyanide levels with prolonged (>72 hrs) use, in renal failure; or coadminister with sodium thiosulfate
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Good luck

