



Pediatric Pearl

Date: 3/27/2025

Subject: Pediatric Hypertension

It is vital to identify and treat children with HTN. Studies have suggested that in doing so we can have an impact on later cardiovascular and renal disease.

There is strong indirect evidence that HTN in children and young adults contributes to premature atherosclerosis and increases the risk of CV disease later in life.

Untreated HTN can lead to Left Ventricular Hypertrophy, Chronic Kidney Disease and progression of preexisting CKD.

For children > 13, Normal BP is < 120/80.

(HTN in children <13 yr. old is defined as > 90%, based on BP percentile tables (see Up to Date for this data).)

Initial evaluation

- 1- Distinguish between primary and secondary HTN
- 2-Identify any treatable conditions - 70-80% of children with secondary HTN have a renal abnormality, of this 25-50% have pyelonephritis.
- 3- Identify other risk factors for early cardiovascular disease -obesity, dyslipidemia, DM

Secondary HTN

Look for signs and symptoms associated with other causes for HTN

- Past Hx of kidney problems
- Possible sleep apnea

- FH of renal disease
- Medications
- Arthritis. Rashes

Lab evaluation

All children with HTN should have baseline Bun, Cr, Electrolytes, UA, Lipids.

Additional labs for obese children - A1C, LFTs (for fatty liver), FBS.

Also recommended

Renal US and ECG

ECHO - if starting meds to assess for LVH

For stage one, or mild HTN: BP

Step One - Lifestyle intervention

- Weight reduction
- Regular vigorous exercise - 30 min, min 3 d a week
- Dietary changes: salt reduction (DASH diet) - Inc fruits, vegetables and low-fat dairy, no added salt (eliminate potato chips, pretzels, processed foods), limit added sugars (Sodas, juice and sweets)
- Healthy sleep - longer sleep duration is associated with lower BP in children
- Avoiding caffeine and energy drinks
- Assess for smoking and alcohol use

Step Two- If BP remains elevated after 6 months then medications are recommended

Definitions

For the purpose of simplicity will focus on children over 13 years of age, pediatric hypertension is rare in children less than 13. However, if you suspect this as a possibility in younger children refer to BP tables in Up to Date.

Children >13

Normal BP. Sys < 120, Dias < 80

Elevated BP. Sys 120-129 and Dias < 80

Stage One. 130/80. To. 138/89

Stage Two. > 140/90

Initial Treatment

Stage One HTN

- A. If no evidence of end organ damage, lifestyle intervention is the first step. If after 6m goals are not met, medication is indicated.
- B. If symptomatic or evidence of end organ damage (LVH, CKD), lifestyle intervention and medication at the onset.

Stage Two HTN

Lifestyle intervention and initiate medication

Acute severe HTN

Emergency eval and Rx if Stage Two and symptoms. (HA, altered mental status, papilledema), or asymptomatic with BP > 180/120.

Other populations:

Pediatric patients with diabetes, especially if albuminuria is present may benefit from early HTN Rx.

Chronic kidney disease - effective BP control can help slow progression.

Secondary HTN

Treating any underlying cause is important. For patients with Renal Artery Stenosis surgery might be required.

Medication

First line— ACE or ARB - esp. for pts with renal disease as they are renal protective, or CCB - (better for RAS as don't contribute to decrease renal Fxn) are first line Rx in children.

Second line - Thiazides- (risk for hyperkalemia, glucose intolerance, weight gain and dyslipidemia), good as add on medication when needed

Special considerations

Adolescent females - CCB is first line as ACE/ARB can have adverse effects on the fetus. These would be second line and used with caution, and counseling about effective contraception.

Laboratory monitoring

ACE and ARB need close monitoring of renal function and electrolytes after starting medication and after significant dose increases.

Thiazides - need to monitor Electrolytes, BS, renal function and lipids

CCB - do not need to monitor

Follow up Apts

Once starting Rx, return in 4-6 weeks and inc meds or add on as needed.

Lifestyle intervention - return in 3m to assess progress and BP monitoring.

Sports

Pts with Stage One need eval for end organ damage prior to sports participation, looking for causes and end organ damage- (primarily LVH). If no evidence of concern, clear for full participation.

Pts with Stage Two- restricted initially until BP under control. As above look for secondary HTN causes and end organ damage. Can participate when cleared and BP has returned to normal

Notes on medications

ACE - dry cough in up to 3%, (can switch to ARB) As a class they can reduce GFR and lead to hyperkalemia.

- Enalapril, Lisinopril, Benazepril and Fosinopril
- Contraindicated in pregnancy and caution in Adol females (need effective contraception).

ARB- contraindicated in pregnancy and caution in adolescent females

- Losartan, Candesartan, Olmesartan and Valsartan
- Can also lead to dec GFR and hyperkalemia

CCB - good first line for several classes of patients:

- Patients who may become pregnant
- Difficult to do lab monitoring
- Hyperkalemia with ACE/ARB
- Thiazides- good initial or second agent , monitor electrolytes.

Beta blockers - not recommended first line, can be second or third agents.