Hypertension

Registrar evidence based education

Definitions

Complications

How to measure

Medications

Lifestyle

Labs

Emergencies

Definitions

- At what level is someone's blood pressure considered hypertensive?
- What is needed to make the diagnosis of hypertension?
- What is a hypertensive emergency?
- What is resistant hypertension?

Complications

- What are the negative effects that a persistently high blood pressure can have on the body?

Another way of asking this is: What are we attempting to prevent by decreasing an individual's blood pressure when they have hypertension?

How to measure

- What is the proper technique for measuring blood pressure?
- What are the questions you should ask when performing a blood pressure check?

Medications

- What is the difference between 1st and 2nd line medications?
- What are the classes/examples of 1st line medications?
- What are classes/examples of 2nd line medications and what are their indications?

Lifestyle

- What are non-pharmacologic ways to decrease blood pressure?
- Approximately how much can each intervention drop the blood pressure?

Labs

- What are routine labs for hypertension?

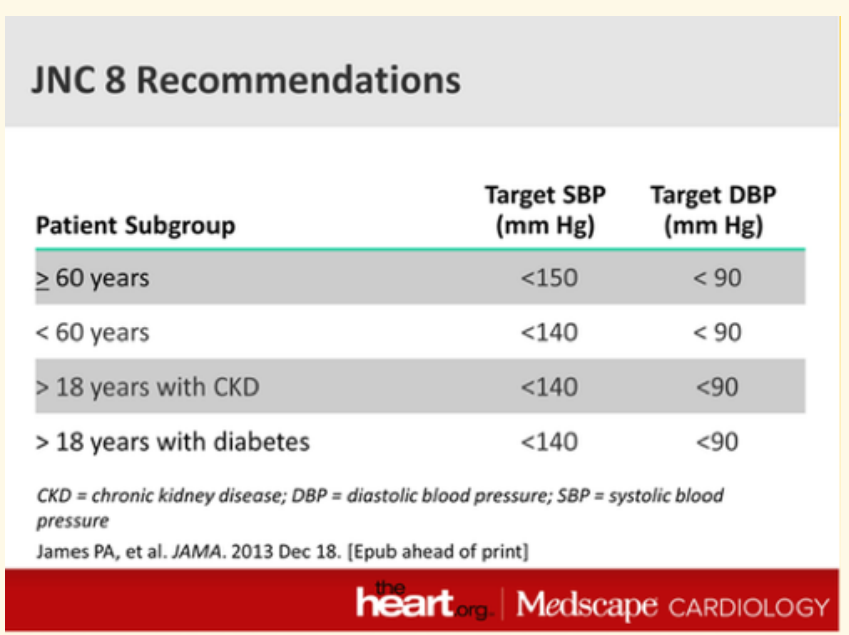
- When are other labs indicated in a work-up of hypertension and what are potential studies you can order?

Emergencies

- Is there a blood pressure level that is considered an emergency?

Definitions

- There are a couple of guidelines for HTN. The most generalizable and least biased is the JNC8 guideline as opposed to the ACC/AHA.
- To make the diagnosis you need two readings above the threshold in the absence of pain, anxiety, acute illness, etc.
- A hypertensive emergency is when there is end-organ damage due to elevated blood pressure, the absolute BP does not make it an emergency and people should not be sent to the ED based on BP.
- Resistant hypertension is diagnosed when a person is still above goal after three 1st line medications have been maxed out.



JNC 8 Recommendations

Patient Subgroup	Target SBP (mm Hg)	Target DBP (mm Hg)
≥ 60 years	<150	< 90
< 60 years	<140	< 90
> 18 years with CKD	<140	<90
> 18 years with diabetes	<140	<90

CKD = chronic kidney disease; DBP = diastolic blood pressure; SBP = systolic blood pressure

James PA, et al. *JAMA*. 2013 Dec 18. [Epub ahead of print]

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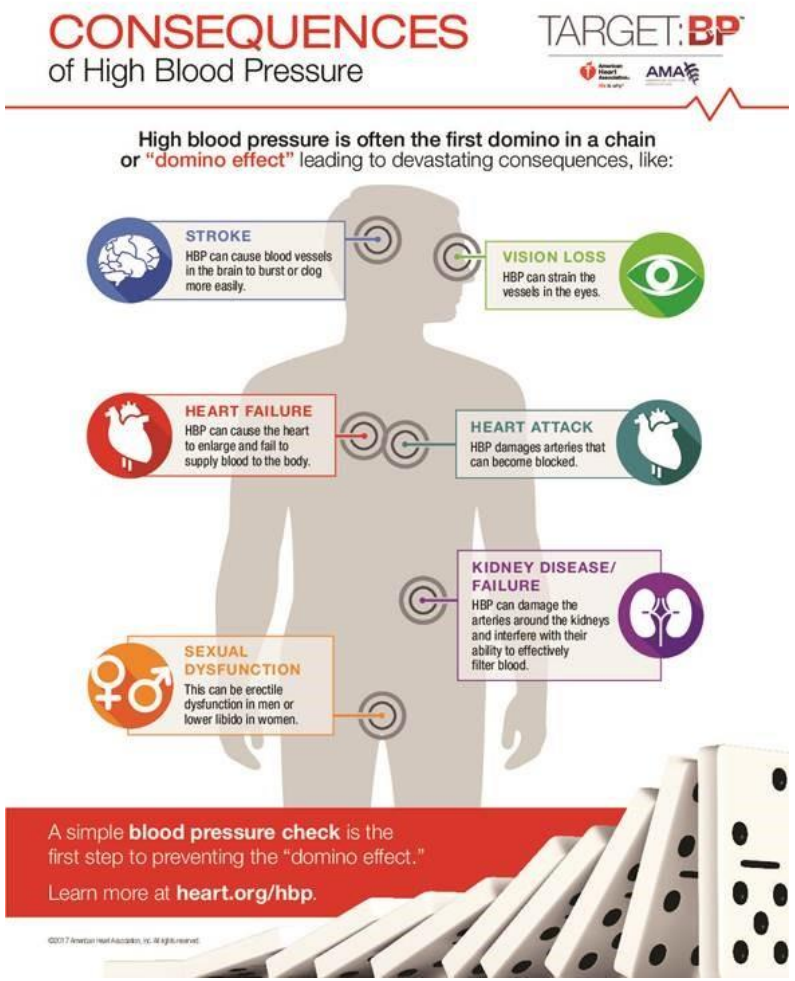
Complications

The most common and serious complications are:

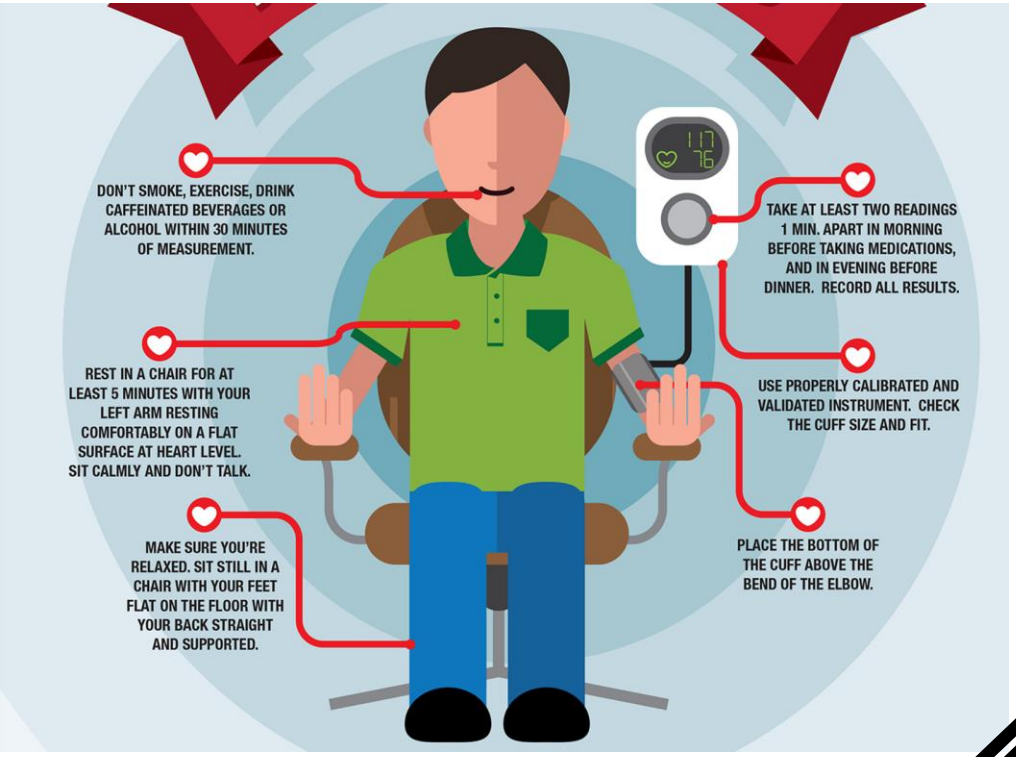
- Heart attack
- Stroke
- Chronic kidney disease/failure
- Heart failure



How to measure

Patient must be:

- Relaxed
- Arm supported at heart level
- Back supported
- Both feet flat on ground
- No talking/interacting
- Proper cuff size
- Cuff is above elbow
- No caffeine/smoking for 30 minutes
- Empty bladder
- Repeat 5 minutes later if abnormal



Medications

1st line

- Prevent/decrease the progression of complications of HTN
- Few side effects
- Affordable
  - Thiazide (hydrochlorothiazide)
  - ACE-inhibitor (lisinopril)
  - ARB (losartan)
  - Calcium Channel Blocker (amlodipine)

2nd line

- resistant hypertension
- treatment of other co-morbidities:
- Loop diuretics CHF, edema
- Betablocker – CAD, CHF, tremor
- Spironolactone – CHF, liver, hyperaldosterone
- Alpha blockers: BPH
- Alpha agonists: pregnancy
- Central agonist: withdrawal
- Vasodilator: alternate

Lifestyle

Effectiveness of lifestyle modifications for lowering BP		
Modification	**Recommendation**	**Approximate BP reduction**
Weight loss	Maintain normal body weight (BMI 18.5-24.9)	5-20 mmHg per 20 lb weight loss
DASH diet	Diet rich in fruits, vegetables, and low-fat dairy products	8-14 mmHg
Physical activity	Aerobic exercise >30 min most days	4-9 mmHg
Low-salt diet	Reduce dietary sodium to max 2,400 mg/day (only if +HTN)	2-8 mmHg
Stress reduction	Practice a stress reduction modality such as meditation regularly	5 mmHg
Moderate alcohol consumption	Limit consumption to max 1 drink per day for women and 2 drinks per day for men	2-4 mmHg
Tobacco cessation	Incorporate cessation modality of choice	2-4 mmHg (1 week after cessation)

Labs

Routine

- A1c: once if normal
- Lipid: every 5 years if normal
  - If ASCVD>10% → statin and no need to repeat lipid panel
- BMP: for renal status yearly
- Urine protein: micro or dip yearly

Additional work if secondary HTN is suspected:

- TSH
- CBC
- Renin/aldosterone
- Renal doppler
- EKG, echo
- Sleep apnea study

Emergencies

- A BP of 180/110 will get providers attention but should not lead to 911 or an ED visit
- A cohort study demonstrated no difference in adverse events for at least 6 months when a person with a BP >180/110 is treated in the outpatient, ED or hospital setting
- History and physical should get a provider to suspect end organ damage, not an absolute BP and not reflexing to the ED because they can do a fast comprehensive work up. The ED normally sends the patient back to their primary care provider.