

What's new in Hypertension

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Outline

- Definition
- How to take an accurate BP
- Non pharmacologic methods
- Ambulatory BP
- White Coat Hypertension
- Day versus night time medication
- Diastolic hypertension

Categories of BP in Adults

BP Category	SBP		DBP
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120–129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130–139 mm Hg	or	80–89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

Accurate Blood pressure

- Really....
- Stressed in the new guidelines with the change in numbers.

Step 1: Properly prepare the patient

1. Have the patient relax, sitting in a chair (feet on floor, back supported) for >5 min.
2. The patient should avoid caffeine, exercise, and smoking for at least 30 min before measurement.
3. Ensure patient has emptied his/her bladder.
4. Neither the patient nor the observer should talk during the rest period or during the measurement.
5. Remove all clothing covering the location of cuff placement.
6. Measurements made while the patient is sitting or lying on an examining table do not fulfill these criteria.

Step 2: Use proper technique for BP measurements

1. Use a BP measurement device that has been validated, and ensure that the device is calibrated periodically.
2. Support the patient's arm (eg, resting on a desk).
3. Position the middle of the cuff on the patient's upper arm at the level of the right atrium (the midpoint of the sternum).
4. Use the correct cuff size, such that the bladder encircles 80% of the arm, and note if a larger- or smaller-than-normal cuff size is used ([Table 9](#)).
5. Either the stethoscope diaphragm or bell may be used for auscultatory readings. [S4.1-5.S4.1-6](#)

Step 3: Take the proper measurements needed for diagnosis and treatment of elevated BP/hypertension

1. At the first visit, record BP in both arms. Use the arm that gives the higher reading for subsequent readings.
2. Separate repeated measurements by 1–2 min.
3. For auscultatory determinations, use a palpated estimate of radial pulse obliteration pressure to estimate SBP. Inflate the cuff 20–30 mm Hg above this level for an auscultatory determination of the BP level.
4. For auscultatory readings, deflate the cuff pressure 2 mm Hg per second, and listen for Korotkoff sounds.

Step 4: Properly document accurate BP readings

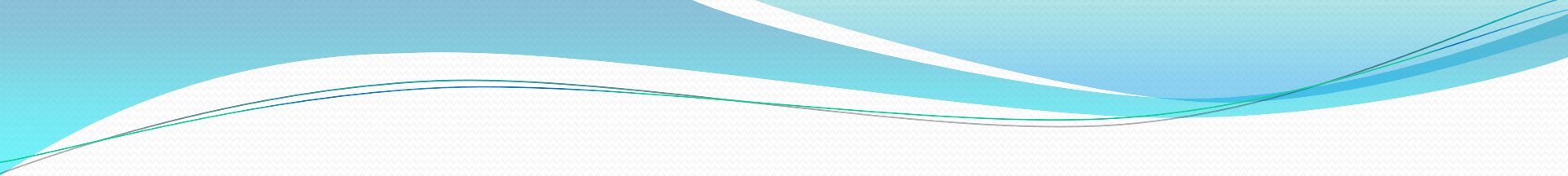
1. Record SBP and DBP. If using the auscultatory technique, record SBP and DBP as onset of the first Korotkoff sound and disappearance of all Korotkoff sounds, respectively, using the nearest even number.
2. Note the time of most recent BP medication taken before measurements.

Step 5: Average the readings

Use an average of ≥ 2 readings obtained on ≥ 2 occasions to estimate the individual's level of BP.

Step 6: Provide BP readings to patient

Provide patients the SBP/DBP readings both verbally and in writing.

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- Oscillometric devices (automatic cuffs) are recommended over auscultatory techniques due to increase in error.

Non-pharmacologic

Intervention	Approximate reduction in systolic BP (mm Hg)
Weight loss	5
Healthful diet	11
Dietary sodium reduction	5 to 6
Dietary potassium increase	4 to 5
Physical activity: <ul style="list-style-type: none">• Aerobic• Dynamic• Isometric	<ul style="list-style-type: none">• 5 to 8• 4• 5
Moderate alcohol intake	4

Out of office BP measurement

- LEVEL of EVIDENCE A for use of Out of OFFICE BP measurements to confirm and to titrate BP-lowering medication.

Office BP: $\geq 130/80$ mm Hg but $< 160/100$ mm Hg
after 3 mo trial of lifestyle modification and
suspected white coat hypertension

Daytime ABPM
or HBPM
BP $< 130/80$ mm Hg

Yes

No

White Coat Hypertension

- Lifestyle modification
- Annual ABPM or HBPM to detect progression (Class IIa)

Hypertension

Continue lifestyle modification and start antihypertensive drug therapy (Class IIa)

Office BP: $120-129/<80$ mm Hg
after 3 mo trial of lifestyle modification and
suspected masked hypertension

Daytime ABPM
or HBPM
BP $\geq 130/80$ mm Hg

Yes

No

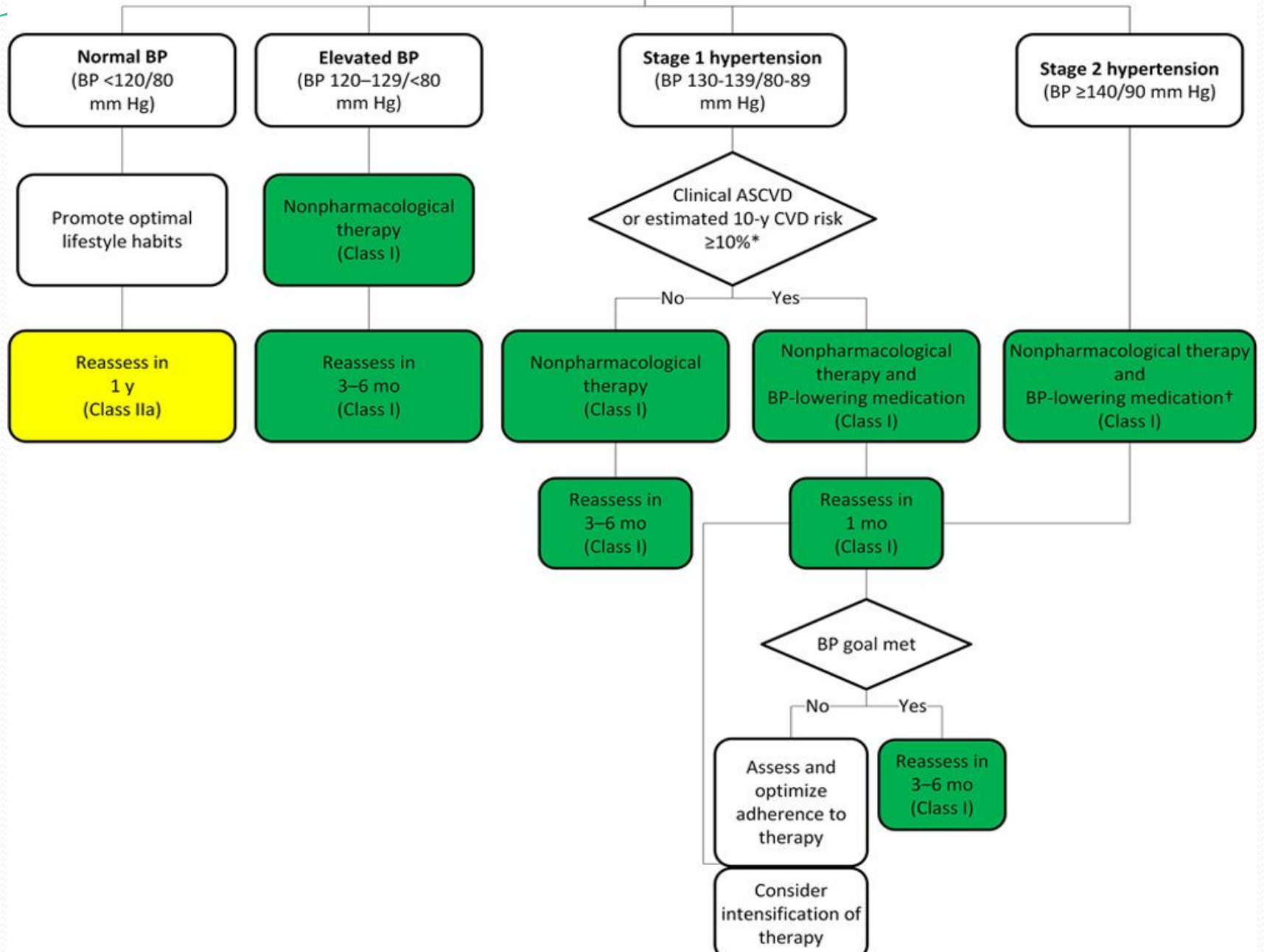
Masked Hypertension

Continue lifestyle modification and start antihypertensive drug therapy (Class IIa)

Elevated BP

- Lifestyle modification
- Annual ABPM or ABPM to detect masked hypertension or progression (Class IIa)

BP thresholds and recommendations for treatment and follow-up



First line therapy

- Thiazides (chlorthaladone preferred)
- Calcium Channel Blockers
- ACE-I
- ARB

Beta Blockers

- Not first line
- Only for CAD and HFrEF

Can I use an ARB after Angioedema with ACE-I

- Yes
 - Risk is that of a placebo or BB
 - Use only if a compelling mortality benefit reason
 - No randomized trials

Night time medications

- **Bedtime hypertension treatment improves cardiovascular risk reduction: the Hygia Chronotherapy Trial**
 - 19084 patients, followed for 6.3 years
 - Used Ambulatory blood pressure monitoring
 - Decreased death due to heart or blood vessel conditions by 66%
 - stroke by 49%

Figure 2 Adjusted hazard ratio of cardiovascular disease outcome as a function of hypertension treatment-time regimen ...

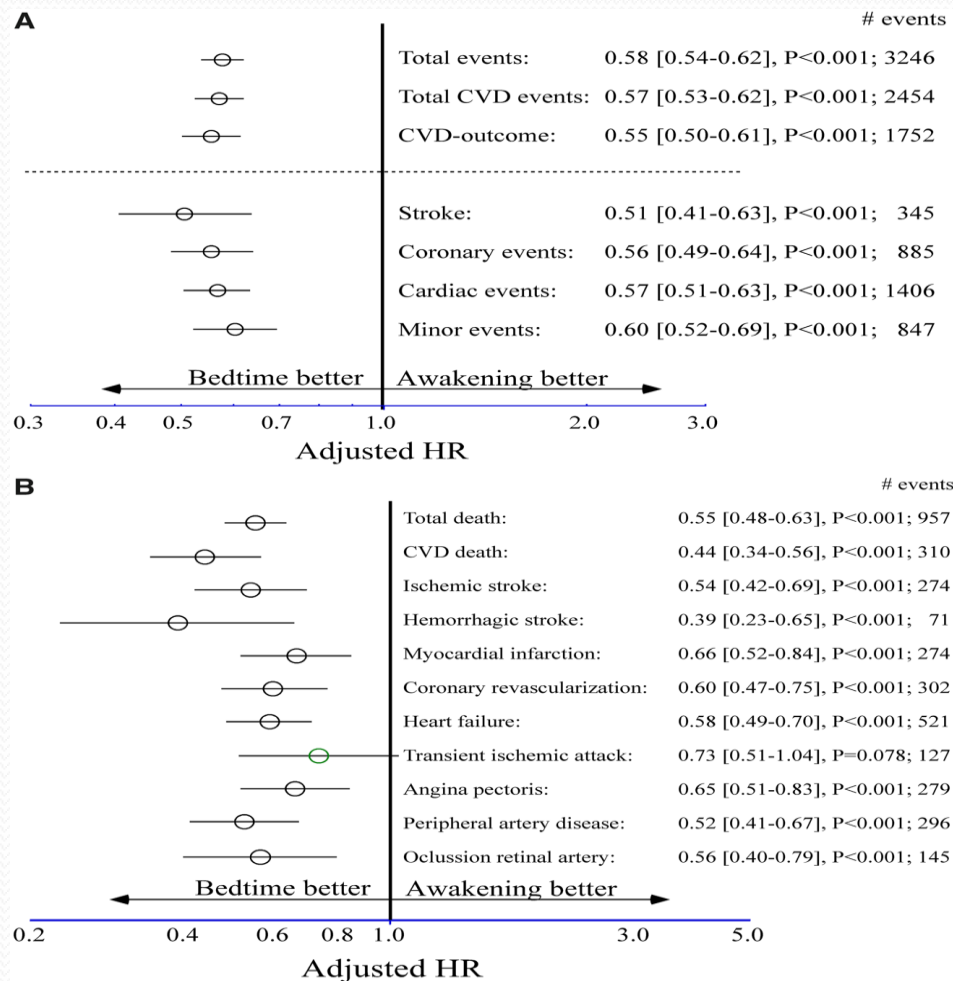
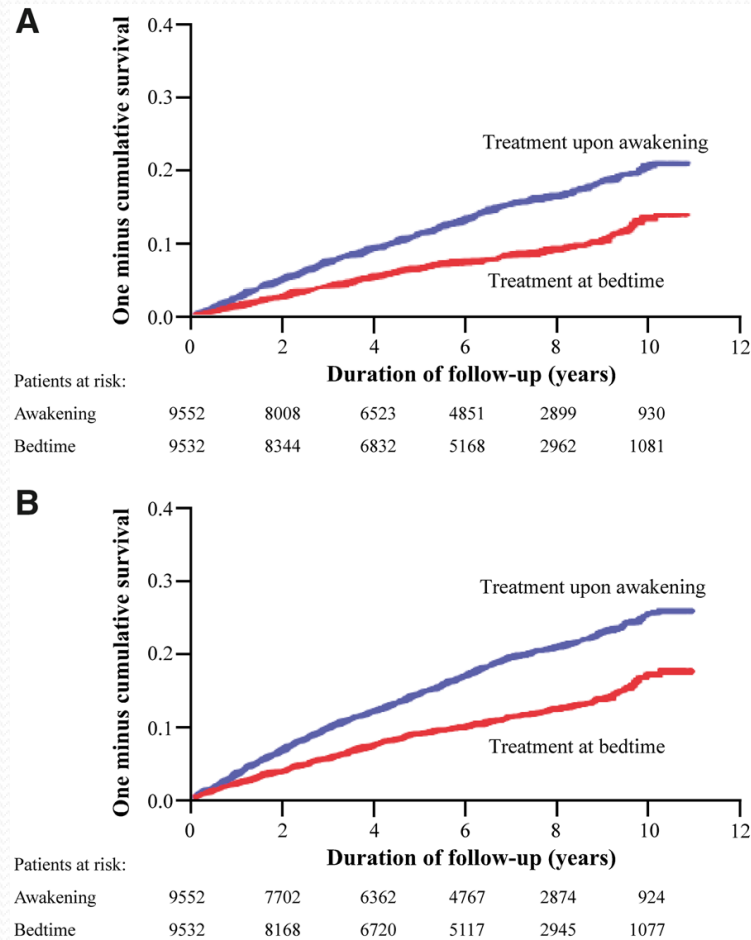


Figure 3 Kaplan–Meier cumulative hazard curves for cardiovascular disease outcome as a function of hypertension ...



Remember to check other medications/substances your patients are taking

- Caffeine
- Oral contraceptives
- NSAIDS
- Alcohol
- Antidepressants (SNRIs and TCAs)
- Decongestants
- St John's wort, yohimbine
- Systemic corticosteroids

Isolated Diastolic HTN- Association of Isolated Diastolic Hypertension Defined by the 2017 ACC/AHA Blood Pressure Guideline with Incident Cardiovascular Outcomes- JAMA 2020

- Defined by 2017 ACC/AHA- may not be associated with increased cardiovascular outcomes
 - Nationally representative US cross sectional study including 9590 adults
 - Prevalence is 6.5%
 - Longitudinal study- No significant association with atherosclerotic cardiovascular disease, heart failure or chronic kidney disease.

Next 10 years in HTN

- Measure BP on watch and phone
- Cuffless devices
- More advanced medications
 - RNA interference (like PCSK9I)
 - Silence gene expression (? angiotensinogen)
- Regeneration of end organ damage

Qardio Arm



ACC Guideline Clinical App



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