




# Newest Guidelines in Hypertension

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November 16, 2018



# What's different about the new recommendations?

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Pharmacologic recommendations

Emphasis on cardiovascular disease

No 'prehypertension'

More hypertension patients

Focus on accurate measurements

Focus on self -monitoring

# 40-year Risk of developing HTN

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- Adults > 45 years without hypertension
  - African Americans 93%
  - Hispanics 92%
  - Whites 86%
  - Chinese 84%

# Risk of CVD in Patients with HTN

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- Increases in a log linear fashion
  - From SBP < 115 mmHg to > 180 mmHg
  - From DBP > 75 mmHg to > 95 mmHg
- SBP > 20 mmHg and DBP > 10 mmHg = 2 X risk of CVA, heart disease, vascular disease
- SBP associated with increased CVD risk, not true for DBP

HMMMM  
135 OVER  
80. YOUR  
BLOOD  
PRESSURE  
IS TOO  
HIGH.

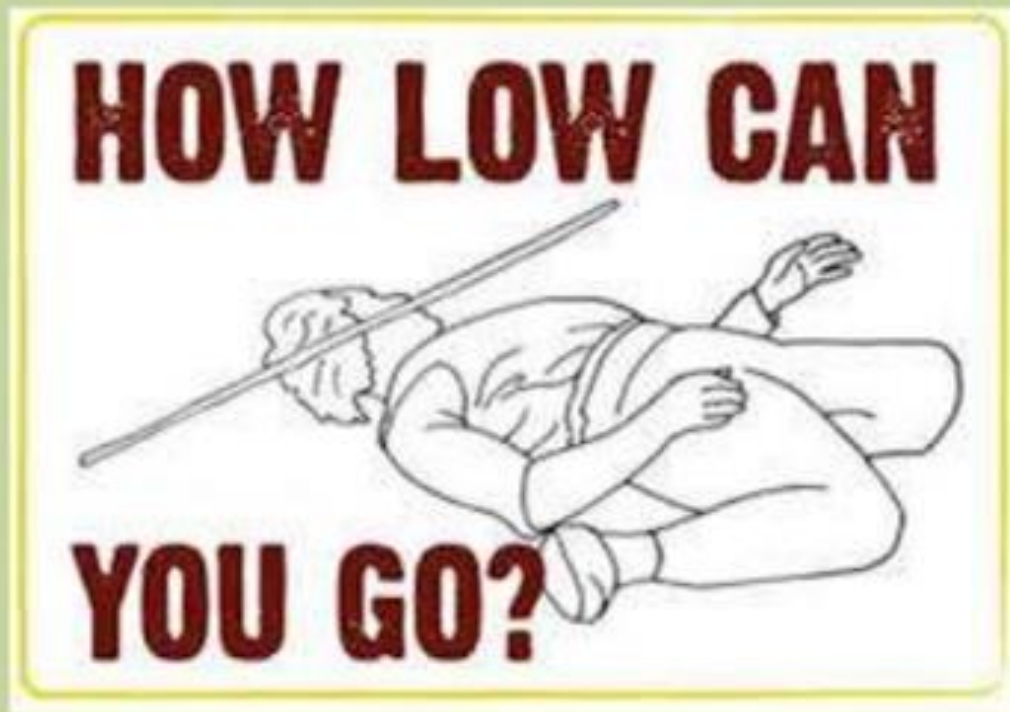
THAT  
CAN'T BE  
RIGHT! YOU  
TOLD ME TO  
KEEP IT  
BELOW 140  
OVER 80?!

THE  
GUIDELINES  
HAVE  
CHANGED

WHOOPS!  
IT JUST  
WENT  
WAAAY  
UP.



What target **BP goals** are recommended in the new guideline?



# Lower is the New Normal

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- Systolic BP <120 mmHg and Diastolic BP <80 mmHg
- Evaluate yearly
- Encourage healthy lifestyle changes to maintain normal BP

# Elevated Blood Pressure

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- Systolic BP 120-129 mmHg and Diastolic BP <80 mmHg
- Recommend healthy lifestyle changes and reassess in 3-6 months



# Stage 1 Hypertension

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- Systolic BP 130-139 mmHg or Diastolic BP 80-89 mmHg
- Assess the 10-year risk for heart disease and stroke

# Atherosclerotic Cardiovascular Disease Risk Calculator (A.S.C.V.D.)

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- Based on Gender, Age, Race, Total Cholesterol, LDL, HDL, Treatment with Statin, SBP, Treatment for HTN, Diabetes, Current Smoker, Aspirin Therapy.

# A.S.C.V.D. (Continued)

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- If risk is <10%, start with healthy lifestyle recommendations and reassess in 3-6 months.
- If risk >10% or the patient has known clinical cardiovascular disease, diabetes, chronic kidney disease, recommend lifestyle changes and BP lowering medication.
- Reassess in 1 month

# A.S.C.V.D. (Continued)

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- If goal is not met after 1 month, consider different medication or titration.
- Continue monthly follow-up until control is achieved.

# Stage 2 Hypertension

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- Systolic BP >140 mmHg or Diastolic BP >90 mm Hg
- Recommend healthy lifestyle changes and BP-lowering medication (2 medications of different classes); reassess in 1 month for effectiveness.

# Stage 2 Hypertension Continued

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- If goal is met after 1 month, reassess in 3-6 months.
- If goal is not met after 1 month, consider different medications or titration.
- Continue monthly follow-up until control is achieved.

# Hypertensive Urgency

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- Systolic BP  $>180$  mmHg and/or Diastolic BP  $>120$  mmHg
- Many are noncompliant without clinical or laboratory evidence of new or worsening target organ damage; reinstitute or intensify antihypertensive drug therapy.
- Treat anxiety if necessary.

# Hypertensive Emergency

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- Systolic BP >180 mmHg + target organ damage and/or Diastolic BP >120 mmHg + target organ damage
- Admit patient to I.C.U. for continuous monitoring of BP and IV administration of appropriate medications.





SIPRESS

*"I'm going to take your blood pressure, so try to relax and not think about what a high reading might mean for your chances of living a long, healthy life."*

# Taking a Blood Pressure Correctly

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- Patient should sit quietly for 5 minutes
- Arm used to measure BP should be supported
- BP cuff should be at heart level
- Correct cuff size is being used
- If manual, cuff should be deflated slowly

# Key Steps for Proper BP Measurements

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Step 1: Properly prepare the patient

## Specific Instructions

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 of 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

# Key Steps for Proper BP Measurements

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Step 2: Use proper technique

## Specific Instructions

1. Use a BP measurement device that has been validated, and ensure that the device is calibrated periodically.
2. Support the patient's arm (e.g., 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.
5. Either the stethoscope diaphragm or bell may be used for auscultatory

# Key Steps for Proper BP Measurements

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Step 3: Take the proper measurements

## Specific Instructions

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 mins.
3. For auscultatory determinations, use a palpated estimate SBP. Inflate the cuff 20-30 mmHg above this level for an auscultatory determination of the BP level.
4. For auscultatory readings, deflate the cuff pressure 2 mmHg per second, and listen for Korotkoff sounds.

# Key Steps for Proper BP Measurements

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Step 4: Properly document accurate readings

## Specific Instructions

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.

# Key Steps for Proper BP Measurements

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Step 5: Average the Readings

## Specific Instructions

1. Use an average of  $\geq 2$  readings obtained on  $\geq 2$  occasions to estimate the individual's level of BP.

# Key Steps for Proper BP Measurements

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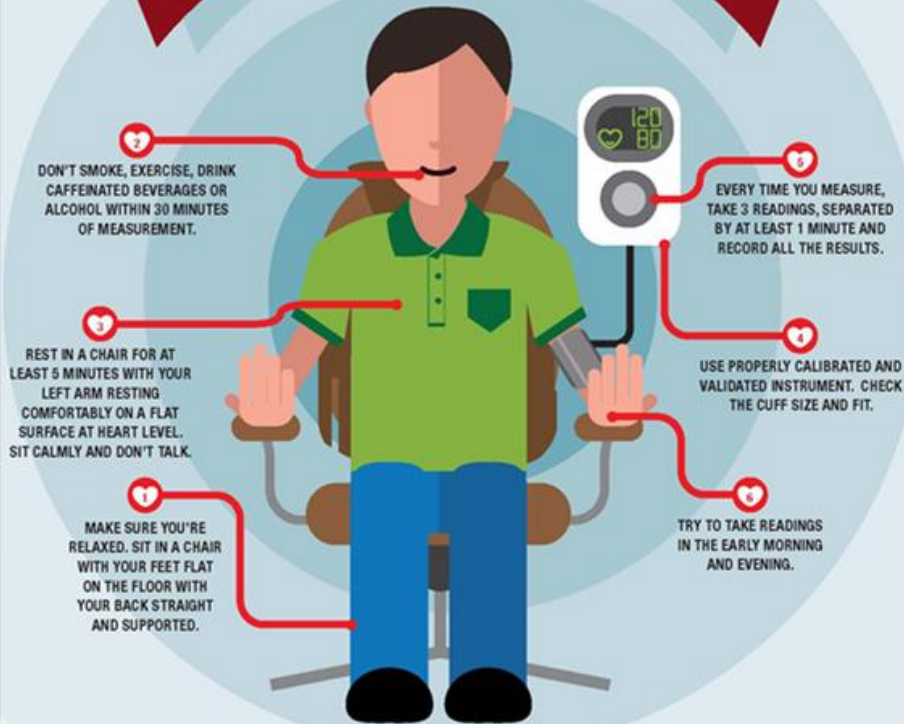
Step 6: Provide BP readings to patient

## Specific Instructions

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



# BLOOD PRESSURE MEASUREMENT INSTRUCTIONS



1 DON'T SMOKE, EXERCISE, DRINK CAFFEINATED BEVERAGES OR ALCOHOL WITHIN 30 MINUTES OF MEASUREMENT.

2 REST IN A CHAIR FOR AT LEAST 5 MINUTES WITH YOUR LEFT ARM RESTING COMFORTABLY ON A FLAT SURFACE AT HEART LEVEL. SIT CALMLY AND DON'T TALK.

3 MAKE SURE YOU'RE RELAXED. SIT IN A CHAIR WITH YOUR FEET FLAT ON THE FLOOR WITH YOUR BACK STRAIGHT AND SUPPORTED.

4 EVERY TIME YOU MEASURE, TAKE 3 READINGS, SEPARATED BY AT LEAST 1 MINUTE AND RECORD ALL THE RESULTS.

5 USE PROPERLY CALIBRATED AND VALIDATED INSTRUMENT. CHECK THE CUFF SIZE AND FIT.

6 TRY TO TAKE READINGS IN THE EARLY MORNING AND EVENING.

# Office based BP measurement

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- Recommend automatic device
  - Ideally an automated device that can take multiple consecutive readings with the patient sitting and resting alone
- Every visit
  - Multiple BP measurements at least twice
    - If 2nd reading > 5 mmHg different take a 3rd and average the last 2
  - After resting comfortably at least 5 minutes

# First Visit for Hypertension

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- Readings in left arm and right arm
  - If  $> 15$  mmHg differences may indicate subclavian stenosis
  - Arm with the higher BP should be used
- Postural blood pressure- especially in patients with symptoms, age  $> 65$  yo, or diabetics

# How to Diagnose HTN

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- BP should be made from at least three separate visits spaced over one week or more
- Average BP drops by an average of 10-15 mmHg between first and third visit in newly diagnosed patients

# Home Blood Pressure Monitoring

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- Semi-automatic devices- \$40-60
- Recommended
  - At least 12-14 measurements
  - Morning and evening measurements
  - Over a period of a week
- Monitors should be checked initially and at least annually
- If unable to find appropriately sized arm cuffs may use wrist cuffs

# Home BP Monitoring

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- Follow the standards as discussed
- Take multiple readings
  - Take at least 2 readings 1 minute apart in morning before taking medications and in evening before supper. Optimally, measure and record BP daily. Ideally, obtain weekly BP readings beginning 2 weeks after a change in the treatment regimen and during the week before a clinic visit.

# Diagnosis of HTN Based on 24 Hour Home BP Monitoring

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- 24-hour mean of 125/75 mmHg or above
- Daytime (awake) mean of 130/80 mmHg or above
- Nighttime (asleep) mean of 110/65 mmHg or above

# Effect of smoking on BP

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- Transiently raises the BP
- Office BP may underestimate usual BP in heavy smoker who has not smoked for > 30 minutes before measurement



# Effect of Caffeine intake on BP

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- Raises the BP acutely
- Especially in people who don't usually drink coffee

# Other Factors Which May Artificially Raise BP

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- Taking the BP in a cool room
  - Can increase by 8-15 mmHg
- Taking the BP while patient is talking

# Leg Blood Pressure

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- Appropriately sized cuff
- Pressure in leg usually 10-20% higher than the arm

# Wrist Blood Pressure

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- Obese patients
- Breast cancer who are s/p axillary lymph node resection
- The wrist needs to be kept at level of heart

# Corresponding BP in Various Settings

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- Office/clinic- 140/90 mmHg
- Home Blood Pressure Monitoring (HBPM)- 135/85 mmHg
- Daytime Automatic Blood Pressure Monitoring (ABPM)- 135/85 mmHg
- Night-time (ABPM)- 120/70 mmHg
- 24-hour (ABPM)- 130/80 mmHg

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)

# When to Screen for White Coat Hypertension

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- Untreated SBP > 130 and < 160 mmHg Or Diastolic Blood Pressure- > 80 and < 100 mmHg
- Use either daytime ABPM or HBPM to diagnose hypertension

# Basic tests to order when diagnosing HTN

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- Fasting blood glucose
- CBC
- Lipids
- BMP
- TSH
- ECG
- Possible Echocardiogram
- Uric Acid
- Urinary albumin-to creatinine ratio
- Urinalysis





**“You can enjoy diabetes, high cholesterol and hypertension or you can suffer from good health.”**

# Non-pharmacological Interventions

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- Weight loss- 1 mmHg per KG of weight loss
- D.A.S.H. diet (Dietary Approaches to Stop Hypertension)
  - High in fruits, vegetables, low-fat dairy products
  - Increase K<sup>+</sup>, Ca<sup>++</sup>, Mg, fiber
  - Reductions of SBP of 11 mmHg and DBP 3 mmHg
  - Especially effective in blacks

# Best Proven Nonpharmacological Interventions for Prevention and Treatment of Hypertension

			Approximate	Impact on SBP
	Nonpharmacological Intervention	Dose	Hypertension	Normotension
Weight Loss	Weight/ body fat	Best goal is ideal body weight, but aim for at least a 1-kg reduction in body weight for most adults who are overweight.	-5 mmHg	- 2-3 mmHg

# Best Proven Nonpharmacological Interventions for Prevention and Treatment of Hypertension

			Approximate	Impact on SBP
	Nonpharmacological Intervention	Dose	Hypertension	Normotension
Healthy Diet	D.A.S.H. Dietary Pattern	Consume a diet rich in fruits, vegetables, whole grains, and low-fat dairy products, with reduced content of saturated and total fat.	-11 mmHg	-3 mmHg

# Non-pharmacological Interventions Continued

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- Sodium reduction- decrease Na intake 25% decreases SBP 2-3 mmHg or more
- Potassium supplementation- dietary consumption 4700 mg/day better than pills, 2-5 mmHg decreases in SBP.

# Best Proven Nonpharmacological Interventions for Prevention and Treatment of Hypertension

			Approximate	Impact on SBP
	Nonpharmacological Intervention	Dose	Hypertension	Normotension
Reduced intake of dietary sodium	Dietary Sodium	Optimal goal is <1500 mg/day, but aim for at least a 1000 mg/day reduction in most adults	-5-6 mmHg	-2-3 mmHg

# Best Proven Nonpharmacological Interventions for Prevention and Treatment of Hypertension

			Approximate	Impact on SBP
	Nonpharmacological Intervention	Dose	Hypertension	Normotension
Enhanced intake of dietary potassium	Dietary potassium	Aim for 3500-5000 mg/day, preferably by consumption of a diet rich in potassium.	-4-5 mmHg	-2 mmHg

# Non-pharmacological Interventions Continued

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- Increased physical activity- aerobic, dynamic resistance and static isometric exercises all beneficial, 4-8 mmHg decreases in SBP.
- Reduction in alcohol consumption-if >3 drinks per day, even decreasing to 2 or fewer helps.



# Physical Activity

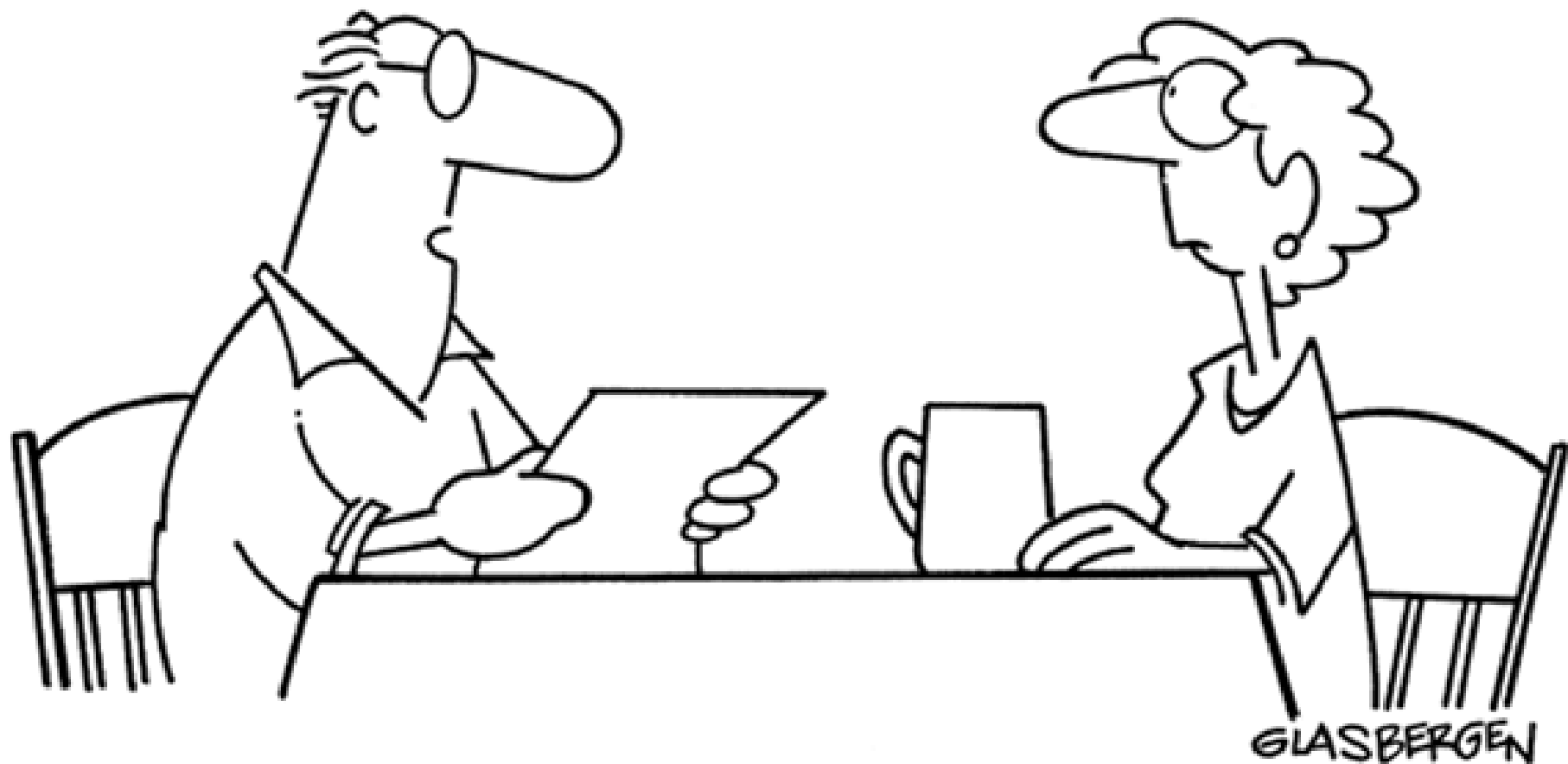
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90-150 minutes weekly

Aerobic and/or dynamic resistance

and/or

3 sessions per week of isometric resistance exercises



**“My blood pressure is 180/90 which mathematically is equal to  $2/1$  which doesn't seem so high!”**

# Caveats of dosage of anti-HTN

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- Largest reduction in BP is seen at a half-standard dose
- Only modest improvement with increasing doses
- After initial dose, going higher produces less further reduction
- Possible that 2 or 3 drugs at half-standard doses may have greater efficacy and less toxicity than 1 drug at standard or twice-standard doses


# Initial Monotherapy

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- Thiazide diuretics
- Long-acting calcium channel blockers
- ACE inhibitors or ARBs
- Not beta blockers in absence of a specific indication

# Thiazide-Like vs Thiazide-Type Diuretics

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- Chlorthalidone 12.5-25 mg daily
  - Indapamide 1.25-5 mg daily
  - HCTZ 12.5-25 mg- is less efficacious, shorter duration of action
  - Hypokalemia only occurs during the first two weeks of therapy
- longer duration of therapy
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# Younger Patients

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- < 50 years
- ACE-I or ARB and beta blockers
- Beta blockers have inferior protection against stroke risk

# Black patients and older adults (> 60 yo)

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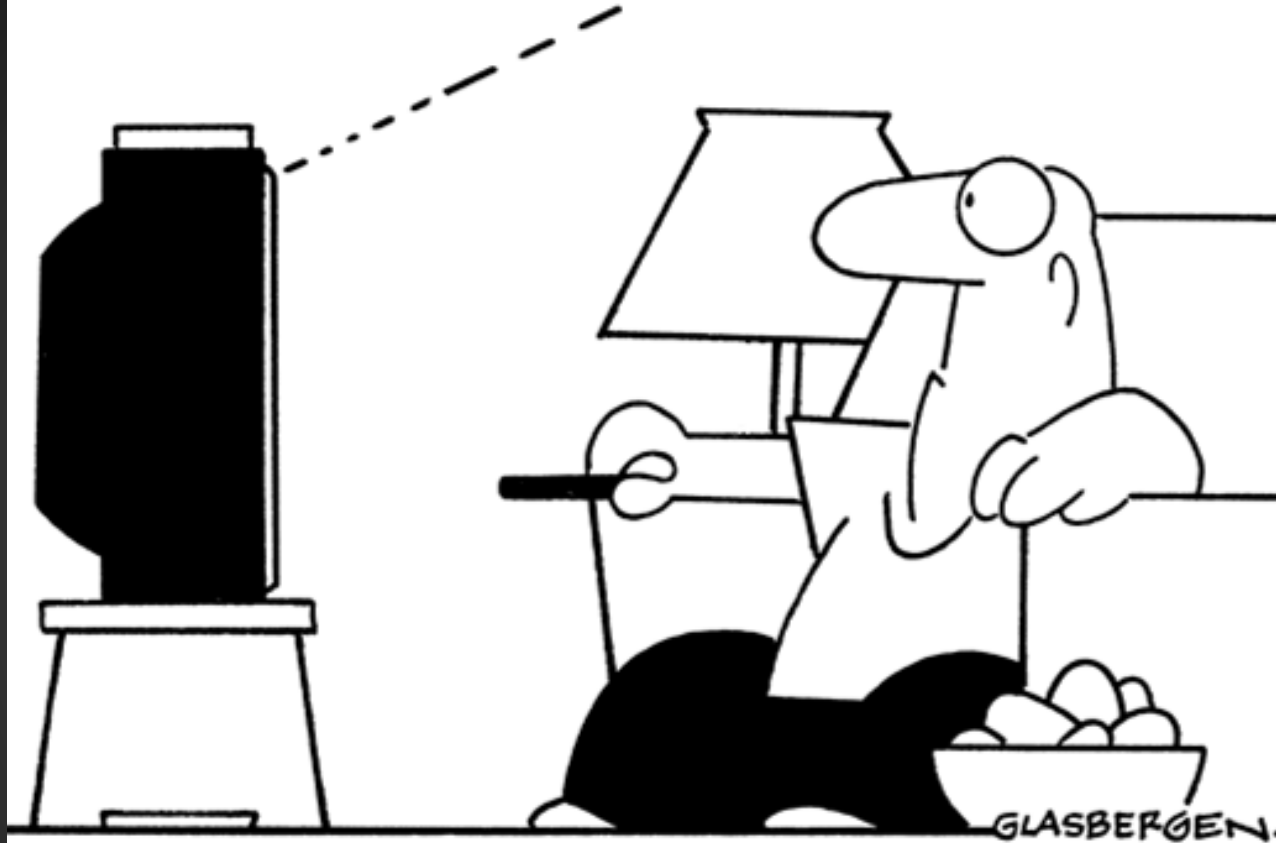
- Thiazide diuretic
- Long-acting calcium channel blocker
- Unless specific indications for ACE I or ARB
  - Heart failure
  - Prior myocardial infarction
  - Proteinuric chronic kidney disease

# ACE-I as First Line Therapy

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- Heart failure or asymptomatic LV dysfunction
- Have had a STEMI
- Non-STEMI who have had an anterior infarction, diabetes or systolic dysfunction
- Proteinuric chronic kidney disease





**“After gobbling everything in sight for 30 years,  
Pac-Man has been diagnosed with diabetes  
high blood pressure and heart disease.”**

# Summary of Changes

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- A strong emphasis on blood-pressure measurement
  - Accuracy of measurements and using average of measure taken over several visits
  - Out-of-office blood pressure measurements
- New approach to decision-making incorporating underlying CV risk

# Summary of Changes (Continued)

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- Lower targets for BP
- Strategies using medical treatment and lifestyle approaches

WOW! YOUR  
CHOLESTEROL  
HAS ME REALLY  
WORRIED!

GACK!

UH... YOU MIGHT  
WANT TO ACTUALLY  
LOOK AT THE  
PATIENT ...



missp



Thank you

Questions?