

Blood Pressure and Diabetes

2023 ESC Guidelines for the management of cardiovascular disease in patients with diabetes

Developed by the task force on the management of cardiovascular disease in patients with diabetes of the European Society of Cardiology (ESC)

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Case

A 65-year-old lady came to office with episodes of headache and palpitation. She had history of diabetes. On examination:

BMI: 30 kg/m²

BP: 155/95

Is she hypertensive? What you do for diagnosis?

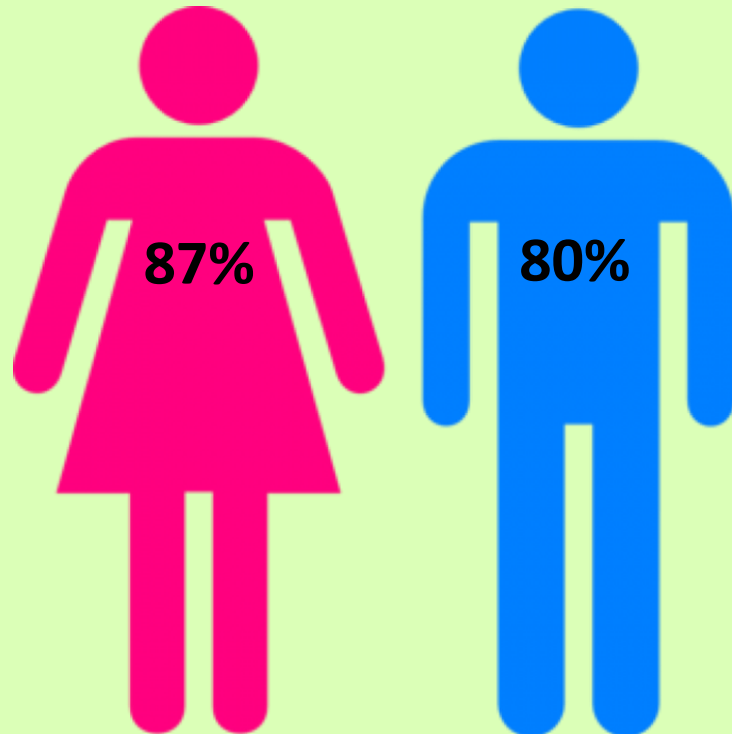
How often do you check her BP?

What are the steps before an accurate BP measurement?

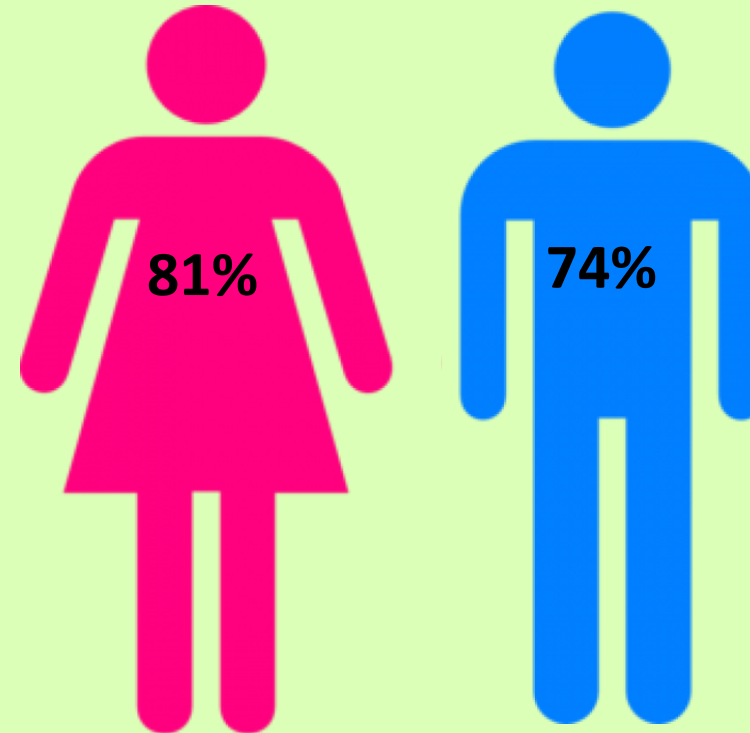


ESC/EUR Observational Research Programme (EORP) EUROASPIRE surveys

History of DM



**Newly diagnosed
with DM**



Screening and diagnosis

Regular BP measurements under standardized conditions are mandatory in all patients with diabetes.

Patient with increased BP

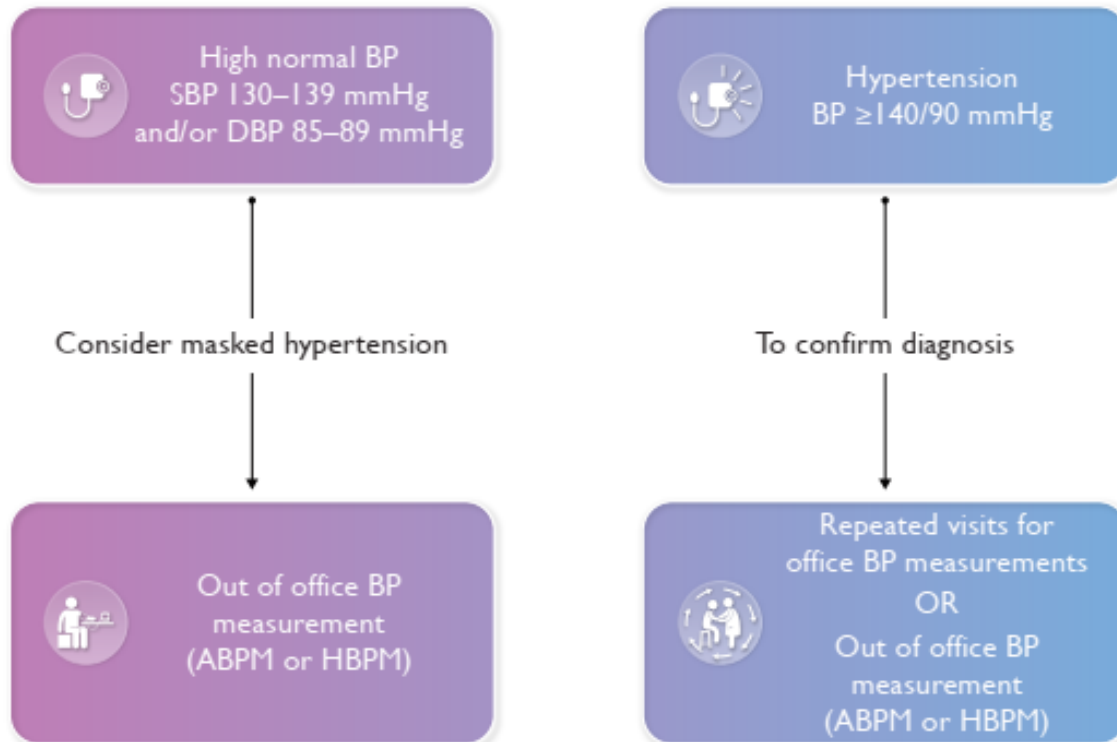


Table 8 Blood pressure measurement

BP measurements at the initial and every follow-up visit (at every routine clinical visit).

Patients should be seated comfortably in a quiet environment for 5 min before beginning BP measurements.

Three BP measurements should be recorded, 1–2 min apart, and additional measurements if the first two readings differ by >10 mmHg. BP is recorded as the average of the last two BP readings.

Measure BP 1 min and 3 min after standing from a seated position in all patients on initial visit to exclude orthostatic hypotension; lying and standing BP measurements should also be considered in subsequent visits.

Out-of-office BP measurement with ambulatory and/or home BP monitoring should be implemented when feasible.

Masked hypertension should be considered in patients with normal and high-normal office BP but with HMOD or at high cardiovascular risk.¹⁹³

BP, blood pressure; HMOD, hypertension-mediated organ damage.

TABLE 8 Checklist for Accurate Measurement of BP (S4.1-3,S4.1-4)

Key Steps for Proper BP Measurements	Specific Instructions
Step 1: Properly prepare the patient	<ol style="list-style-type: none">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	<ol style="list-style-type: none">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 (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	<ol style="list-style-type: none">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	<ol style="list-style-type: none">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.

Table 8 Office blood pressure measurement

Patients should be seated comfortably in a quiet environment for 5 min before beginning BP measurements.

Three BP measurements should be recorded, 1–2 min apart, and additional measurements only if the first two readings differ by >10 mmHg. BP is recorded as the average of the last two BP readings.

Additional measurements may have to be performed in patients with unstable BP values due to arrhythmias, such as in patents with AF, in whom manual auscultatory methods should be used as most automated devices have not been validated for BP measurement in patients with AF.^a

Use a standard bladder cuff (12–13 cm wide and 35 cm long) for most patients, but have larger and smaller cuffs available for larger (arm circumference >32 cm) and thinner arms, respectively.

The cuff should be positioned at the level of the heart, with the back and arm supported to avoid muscle contraction and isometric exercise-dependant increases in BP.

When using auscultatory methods, use phase I and V (sudden reduction/disappearance) Korotkoff sounds to identify SBP and DBP, respectively.

Measure BP in both arms at the first visit to detect possible between-arm differences. Use the arm with the higher value as the reference.

Measure BP 1 min and 3 min after standing from a seated position in all patients at the first measurement to exclude orthostatic hypotension. Lying and standing BP measurements should also be considered in subsequent visits in older people, people with diabetes, and people with other conditions in which orthostatic hypotension may frequently occur.

Record heart rate and use pulse palpation to exclude arrhythmia.

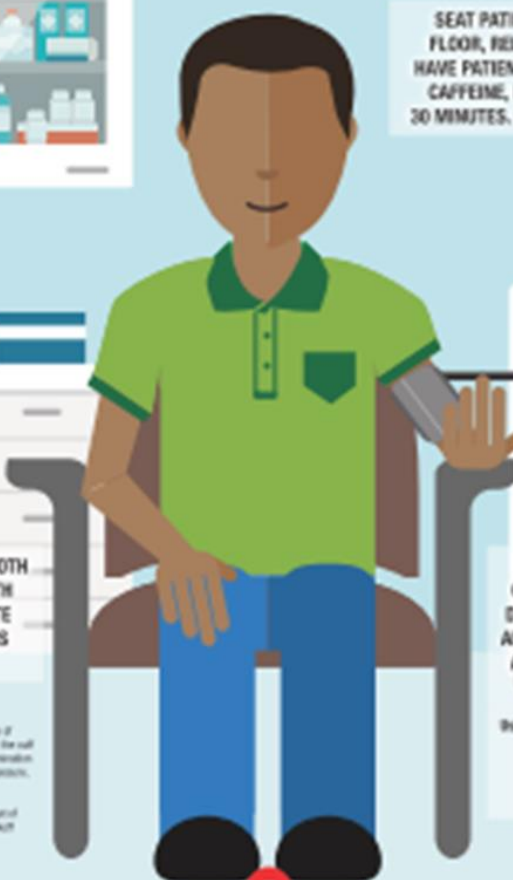
- Hypertension should be confirmed:

- In both arms
- Using multiple readings, including measurements on separate days.

- In patients with CVD and values $>180/110$ mmHg, it could be reasonable to diagnose hypertension at a single visit.



STEPS FOR ACCURATE BP MEASUREMENT



1 SEAT PATIENT WITH FEET FLAT ON THE FLOOR, RELAXED AND QUIET FOR 5 MIN. HAVE PATIENT EMPTY BLADDER AND AVOID CAFFEINE, EXERCISE AND SMOKING FOR 30 MINUTES. REMOVE CLOTHING FROM ARM.

2 USE PROPERLY VALIDATED, CALIBRATED BP MEASUREMENT DEVICE. SUPPORT PATIENT'S ARM AND POSITION CUFF ON BARE ARM AT LEVEL OF THE RIGHT ATRIUM. USE CORRECT CUFF SIZE.

3 FIRST VISIT, RECORD BP IN BOTH ARMS, USING THE ARM WITH HIGHER READING. SEPARATE REPEATED MEASUREMENTS BY 1-2 MINUTES.*

4 RECORD SBP AND DBP**, NOTE TIME OF MOST RECENT BP MED TAKEN BEFORE MEASUREMENT.

5 USE AN AVERAGE OF 2 READINGS OBTAINED ON 2 OCCASIONS TO ESTIMATE THE INDIVIDUAL'S LEVEL OF BP.

6 PROVIDE PATIENT THE SBP/DBP READINGS BOTH VERBALLY AND IN WRITING.

*For ambulatory blood pressure monitoring, use validated automatic or manual sphygmomanometer. Do not use a cuff that is too small or too large. For ambulatory readings, do not use a cuff pressure, 2 mm Hg or more above or below the correct cuff pressure.

**For auscultatory technique, record SBP and DBP as measured by the first sound and disappearance of the sound respectively using the Korotkoff sounds.

Cuff sizes based on arm circumference:
22-29 cm = Small Adult
27-34 cm = Adult
35-44 cm = Large Adult
45-52 cm = Adult Thigh

BLOOD PRESSURE MEASUREMENT INSTRUCTIONS



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

2 TAKE AT LEAST TWO READINGS 1 MIN. APART IN MORNING BEFORE TAKING MEDICATIONS, AND IN EVENING BEFORE DINNER. RECORD ALL RESULTS.

3 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.

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

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

6 PLACE THE BOTTOM OF THE CUFF ABOVE THE BEND OF THE ELBOW.

- In **older** people, people with **diabetes**, or people with other causes of orthostatic hypotension, **BP should also be measured 1 min and 3 min after standing.**
- **Orthostatic hypotension** is defined as a reduction in SBP of > 20 mmHg or in DBP of > 10 mmHg within 3 min of standing, and is **associated with an increased risk of mortality and CV events.**



Table 3 Classification of office blood pressure^a and definitions of hypertension grade^b

Category	Systolic (mmHg)		Diastolic (mmHg)
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High normal	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grade 2 hypertension	160–179	and/or	100–109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension ^b	≥140	and	<90

BP = blood pressure; SBP = systolic blood pressure.

^aBP category is defined according to seated clinic BP and by the highest level of BP, whether systolic or diastolic.

^bIsolated systolic hypertension is graded 1, 2, or 3 according to SBP values in the ranges indicated.

The same classification is used for all ages from 16 years.

Unattended Office Blood Pressure Measurement

(Unattended Automated Office BP 'AOBP')



- Automated multiple BP readings in the doctor's office.
- The patient is seated **alone and unobserved**, the 'white-coat effect' can be substantially reduced or eliminated.
- Evidence suggests that conventional office SBP readings may be at least 5–15 mmHg higher than SBP levels obtained by unattended office BP measurements.

Out - of - Office Blood Pressure Measurement

- Average of all BP readings...
 - For at least 3 days and preferably for 6–7 consecutive days before each clinic visit,
 - With readings in the morning and the evening, taken in a quiet room after 5 minutes of rest,
 - With the patient seated with their back and arm supported.
 - Two measurements should be taken at each measurement session, performed 1–2 min apart.
- ❖ Compared with office BP, HBPM values are usually lower, and the **diagnostic threshold for hypertension is $\geq 135/85$ mmHg**.

My Blood Pressure Log



Name _____

My Blood Pressure Goal _____ mm Hg

Instructions

- Measure your blood pressure twice a day—morning and late afternoon—at about the same times every day.
- For best results, sit comfortably with both feet on the floor for at least two minutes before taking a measurement.
- When you measure your blood pressure, rest your arm on a table so the blood pressure cuff is at about the same height as your heart.
- Record your blood pressure on this sheet and show it to your doctor at every visit.
- You can also use AHA's Check. Change. *Control*.® Tracker (**ccctracker.com/aha**), a free online tool to help you track and monitor your blood pressure.
- You will need a campaign code to sign up for the CCC Tracker. Find the campaign code on the map for your state and sign up.

[illegible]

TABLE 10 Procedures for Use of HBPM (S4.2-8–S4.2-10)

Patient training should occur under medical supervision, including:

- Information about hypertension
- Selection of equipment
- Acknowledgment that individual BP readings may vary substantially
- Interpretation of results

Devices:

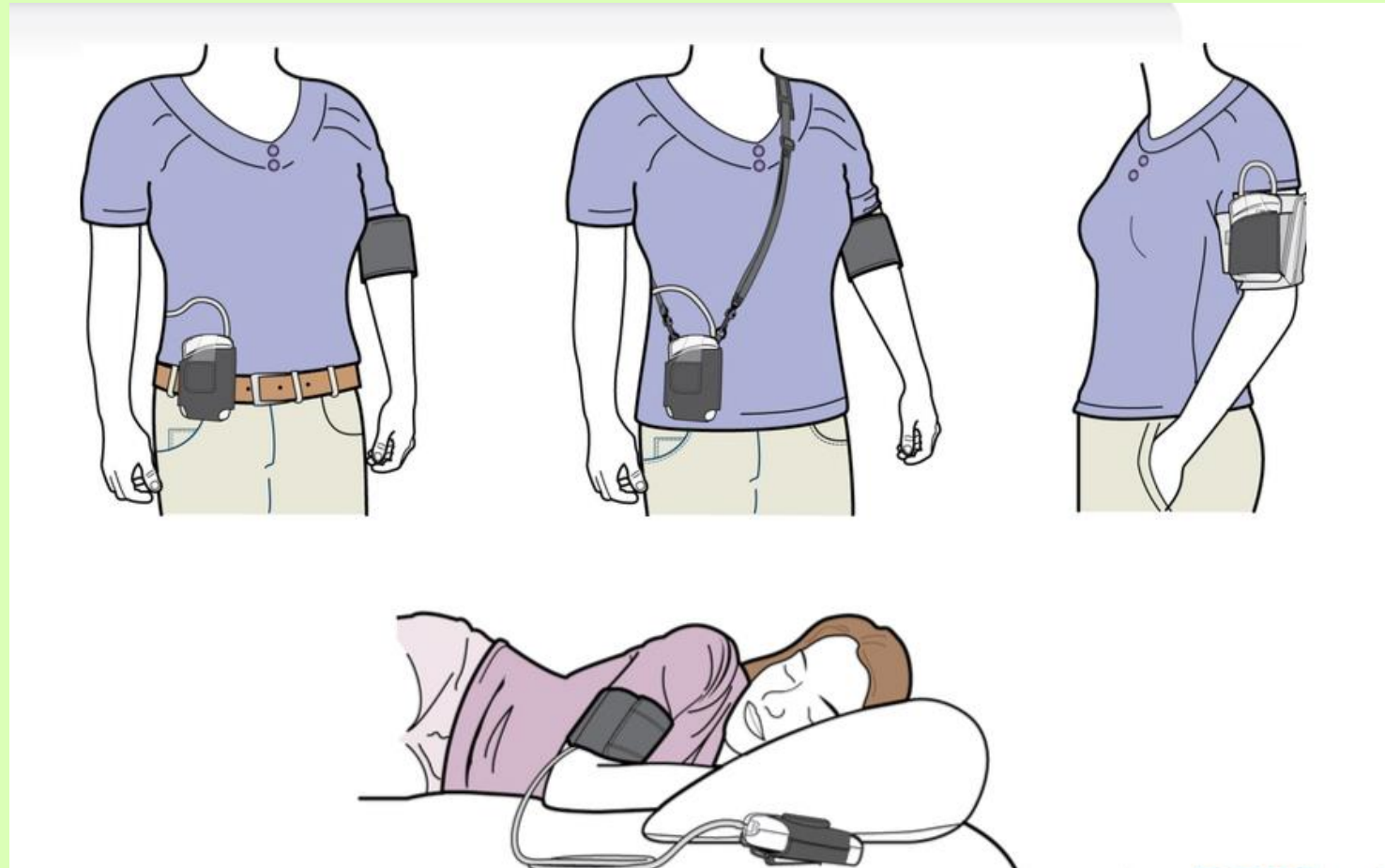
- Verify use of automated validated devices. Use of auscultatory devices (mercury, aneroid, or other) is not generally useful for HBPM because patients rarely master the technique required for measurement of BP with auscultatory devices.
- Monitors with provision for storage of readings in memory are preferred.
- Verify use of appropriate cuff size to fit the arm ([Table 9](#)).
- Verify that left/right inter-arm differences are insignificant. If differences are significant, instruct patient to measure BPs in the arm with higher readings.

Instructions on HBPM procedures:

- **Remain still:**
 - Avoid smoking, caffeinated beverages, or exercise within 30 min before BP measurements.
 - Ensure ≥ 5 min of quiet rest before BP measurements.
- **Sit correctly:**
 - Sit with back straight and supported (on a straight-backed dining chair, for example, rather than a sofa).
 - Sit with feet flat on the floor and legs uncrossed.
 - Keep arm supported on a flat surface (such as a table), with the upper arm at heart level.
- Bottom of the cuff should be placed directly above the antecubital fossa (bend of the elbow).
- **Take multiple readings:**
 - Take at least 2 readings 1 min 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.
- **Record all readings accurately:**
 - Monitors with built-in memory should be brought to all clinic appointments.
 - BP should be based on an average of readings on ≥ 2 occasions for clinical decision making.

The information above may be reinforced with videos available [online](#).

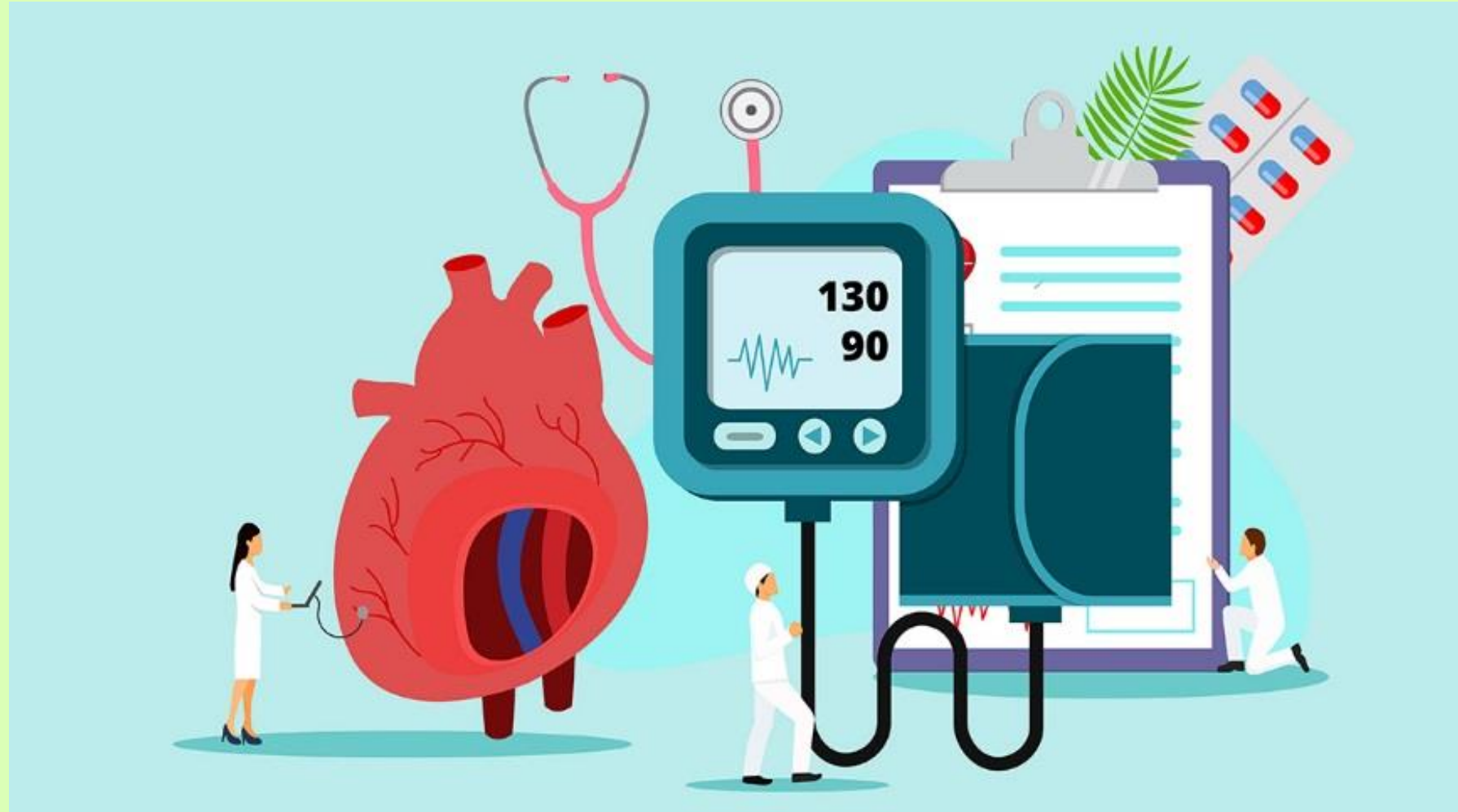
Ambulatory blood pressure monitoring (ABPM)



- ABPM provides the average of BP readings over a defined period, usually 24 h.
- Record BP at 15 - 30 min intervals, and average BP values are usually provided for daytime, night-time, and 24 h.
- A minimum of 70% usable BP recordings are required for a valid ABPM measurement session.
- ABPM values are, on average, lower than office BP values, and **the diagnostic threshold for hypertension is:**
 - ✓ $\geq 130/80$ mmHg over 24 h,
 - ✓ $\geq 135/85$ mmHg for the daytime average,
 - ✓ and $\geq 120/70$ for the night-time average (all equivalent to office BP $\geq 140/90$ mmHg).
- ABPM is a better predictor of HMOD than office BP.
- Closer relationship with morbid or fatal events.

Recommendations	Class ^a	Level ^b
Screening for hypertension		
Regular BP measurements ^c are recommended in all patients with diabetes to detect and treat hypertension to reduce CV risk. ^{193,232,233}	I	A
Home BP self-monitoring should be considered in patients with diabetes on anti-hypertensive treatments to check that BP is appropriately controlled. ²⁴²	Ila	B
24 h ambulatory blood pressure monitoring should be considered to assess abnormal 24 h BP patterns, including nocturnal hypertension and reduced or reversed nocturnal BP dipping, and to adjust anti-hypertensive treatment. ²⁴³	Ila	B

Confirming the diagnosis of hypertension



BP can be highly variable, thus **the diagnosis of hypertension**
should not be based on a single set of BP readings at a single office visit,

unless

the BP is substantially increased (e.g. grade 3 hypertension)

and

there is clear evidence of HMOD (e.g. hypertensive retinopathy with exudates and hemorrhages, or LVH, or vascular or renal damage)

- The number of visits and the time interval between visits varies according to the severity of the hypertension:

More substantial BP elevation (e.g. grade 2 or more)

→ Fewer visits and shorter time intervals between visits (i.e. a few days or weeks)

Patients with BP elevation in the grade 1 range,

→ The period of repeat measurements may extend over a few months, especially when the patient is at low risk and there is no HMOD.



wikiHow to Determine If You Have Hypertension

On standard BP measurements and with HBPM, her average BP was 150/90.

What is your target for BP management?

- **< 120/80**
- **<130/85**
- **<135/85**
- **<140/90**



Treatment targets

RCTs have shown the benefit (reduction of stroke, coronary events, and kidney disease) of **lowering SBP to <140 mmHg and diastolic blood pressure (DBP) to <90 mmHg in patients with diabetes.**

?? However, the optimal BP target in patients with diabetes is still a **matter of debate.**



- In a meta-analysis of RCTs involving patients with diabetes or prediabetes, an **SBP reduction to ≤ 135 mmHg compared with a less intensive control reduced the RR of all-cause mortality by 10%**, whereas more intensive BP control (≤ 130 mmHg) was associated with a greater reduction in stroke but did not reduce other events.
- Similarly, **anti-hypertensive treatment significantly reduced mortality in people with T2DM, CAD, HF, and stroke, with an achieved mean SBP of 138 mmHg, whereas only stroke was reduced significantly, with a mean SBP of 122 mmHg compared with higher BP values.**

Meta-Analysis > Circulation. 2011 Jun 21;123(24):2799-810, 9 p following 810.
doi: 10.1161/CIRCULATIONAHA.110.016337. Epub 2011 May 31.

Blood pressure targets in subjects with type 2 diabetes mellitus/impaired fasting glucose: observations from traditional and bayesian random-effects meta-analyses of randomized trials

Sripal Bangalore ¹, Sunil Kumar, Iryna Lobach, Franz H Messerli

Affiliations + expand

PMID: 21632497 DOI: 10.1161/CIRCULATIONAHA.110.016337

Meta-Analysis > Diabetes Metab. 2019 Dec;45(6):550-556. doi: 10.1016/j.diabet.2019.05.003.
Epub 2019 May 28.

Association between difference in blood pressure reduction and risk of cardiovascular events in a type 2 diabetes population: A meta-regression analysis

G Grenet ¹, H H Le ², T Bejan-Angoulvant ³, S Erpeldinger ⁴, R Boussageon ⁵, B Kassaï ⁶,
P Moulin ⁷, F Gueyffier ⁶, M Cucherat ⁶



Affiliations + expand

PMID: 31150802 DOI: 10.1016/j.diabet.2019.05.003

- Reducing SBP to <130 mmHg may benefit patients with a particularly high risk of a cerebrovascular event, such as those with a history of stroke.
- However, SBP >140 mmHg or <120 mmHg was related to higher risk of adverse renal outcomes in patients with diabetes when compared with those without diabetes and with high CV risk.



The 2018 ESC/ESH hypertension guideline and the 2019 NICE hypertension guideline, how and why they differ

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2021 ESC Guidelines on cardiovascular disease prevention in clinical practice

Developed by the Task Force for cardiovascular disease prevention in clinical practice with representatives of the European Society of Cardiology and 12 medical societies

2023 ESH Guidelines for the management of arterial hypertension
The Task Force for the management of arterial hypertension of the European Society of Hypertension

Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA)

Office BP should be targeted to:

- **SBP of 130 mmHg, and lower if tolerated but not <120 mmHg;**
- **DBP should be lowered to <80 mmHg but not <70 mmHg.**

In older patients (age ≥65 years), the SBP target range should be 130–140 mmHg if tolerated.

Office SBP treatment target:

- **Ranges of 120–130 mmHg in patients with diabetes, with lower SBP acceptable if tolerated until the age of 69 years.**

In patients aged ≥70 years, SBP values <140 mmHg, down to 130 mmHg if tolerated are recommended.

DBP treatment target <80 mmHg is recommended for all treated patients.

The 2023 ESC/ESH Guidelines confirmed the above mentioned targets.

It is recommended to treat hypertension in patients with diabetes in an individualized manner. The BP goal is to target SBP to 130 mmHg and <130 mmHg if tolerated, but not <120 mmHg. In older people (age >65 years), it is recommended to target SBP to 130–139 mmHg.^{196,236–238}

I

A

An on-treatment SBP target of <130 mmHg may be considered in patients with diabetes at particularly high risk of a cerebrovascular event to further reduce their risk of stroke.^{194–198,239,240}

IIb

B

What are your non-pharmacologic and pharmacologic recommendations for the patient?



Management of Hypertension in Diabetes



Diabetes



Hypertension

Effects of lifestyle intervention and weight loss

Diets rich in vegetables, fruits, and low-fat dairy products, such as:

- Mediterranean diets

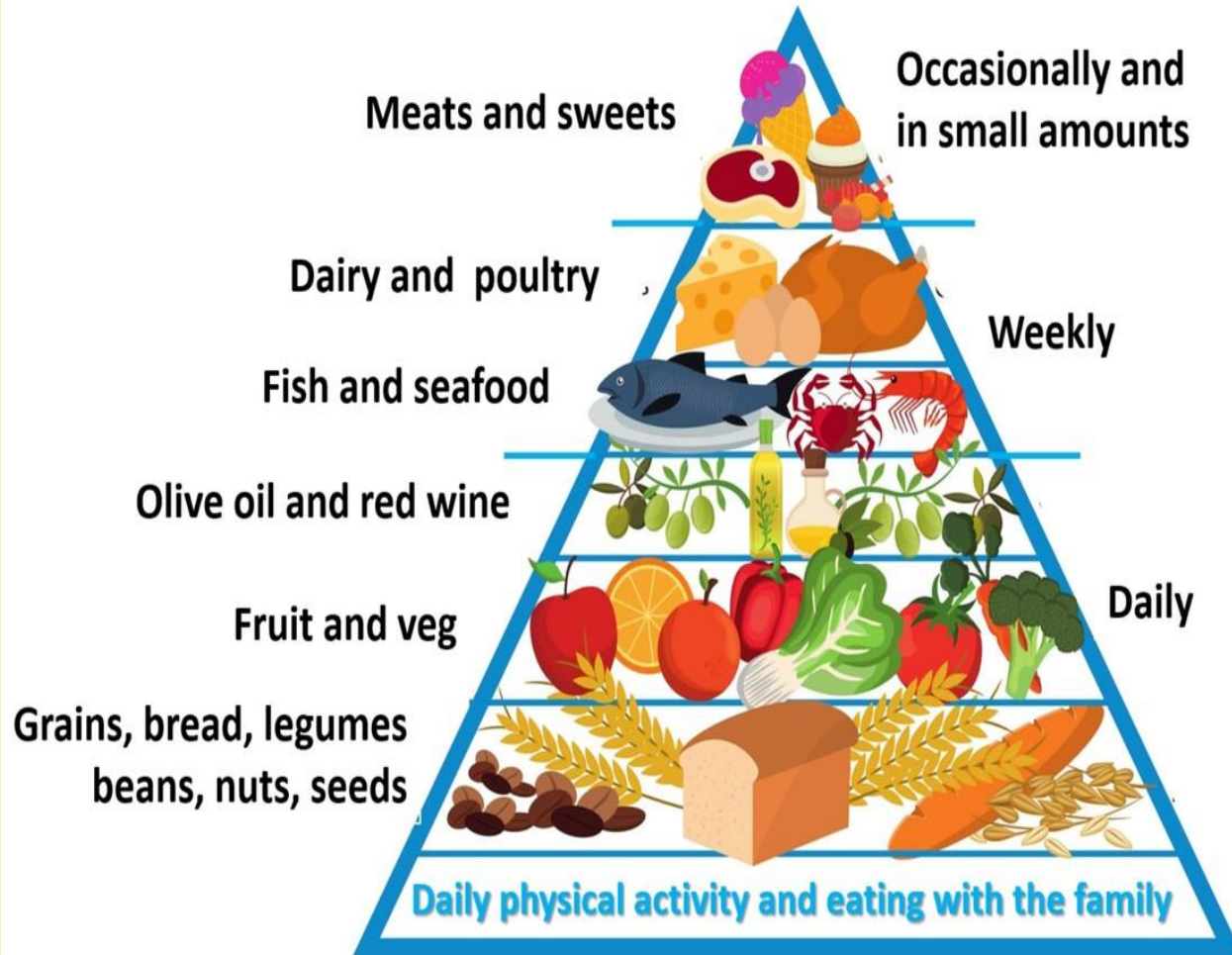
and

- DASH (Dietary Approaches to Stop Hypertension) diet (including reducing sodium to <100 mmol/day and increasing potassium intake)

improve BP control.

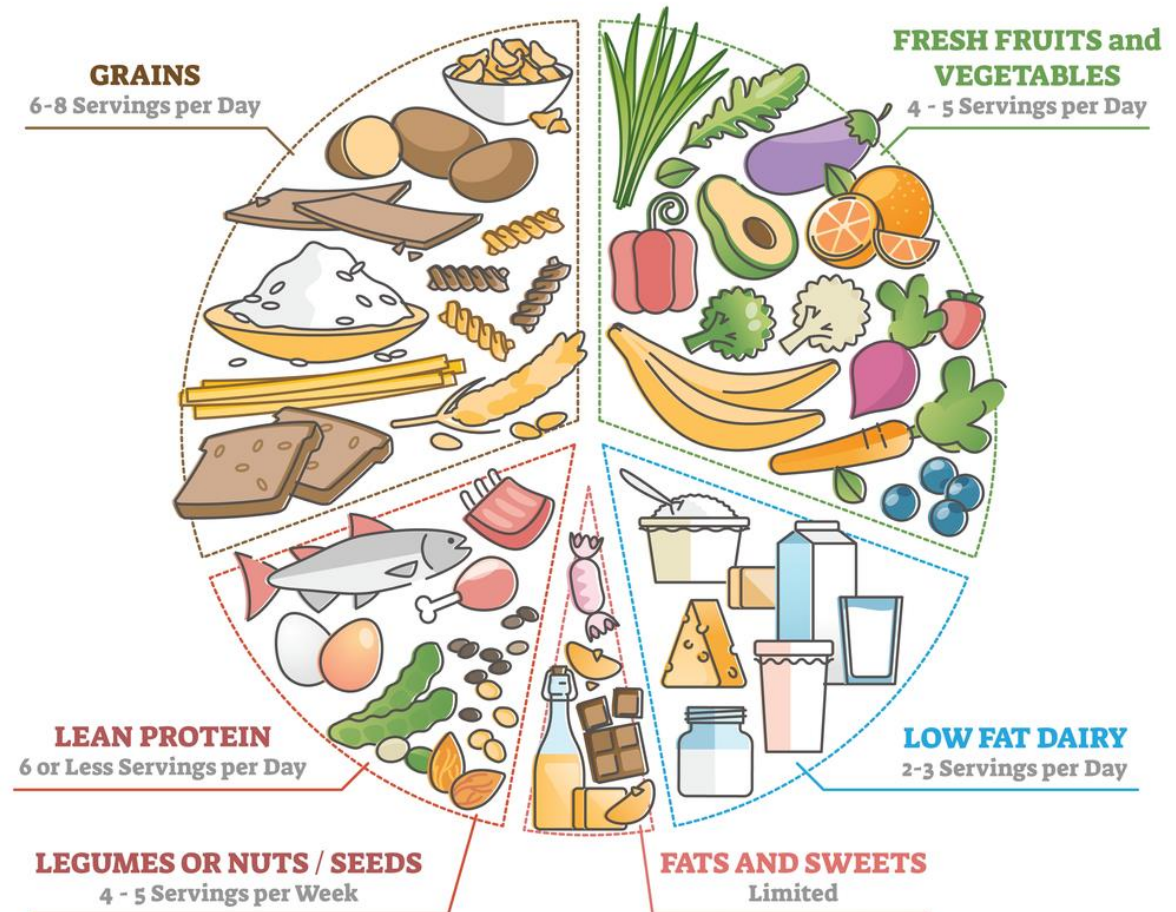


The MEDITERRANEAN Diet



The DASH Diet

DIETARY APPROACHES TO STOP HYPERTENSION



Long-term exercise training intervention
modestly but significantly reduces SBP
(by -7 mmHg) and DBP (by -5 mmHg).

Ideally, an exercise prescription aimed at lowering BP in individuals with normal BP or hypertension would include a **mix of predominantly aerobic exercise training supplemented with dynamic resistance exercise training.**



A marked improvement in CV risk factors (hypertension, dyslipidemia, diabetes), associated with marked weight loss, was observed after bariatric surgery.



Lifestyle changes (weight loss if overweight, physical activity, alcohol restriction, sodium restriction, increased consumption of vegetables, using low-fat dairy products) are recommended in patients with diabetes and hypertension.^{205–207,210}

I

A

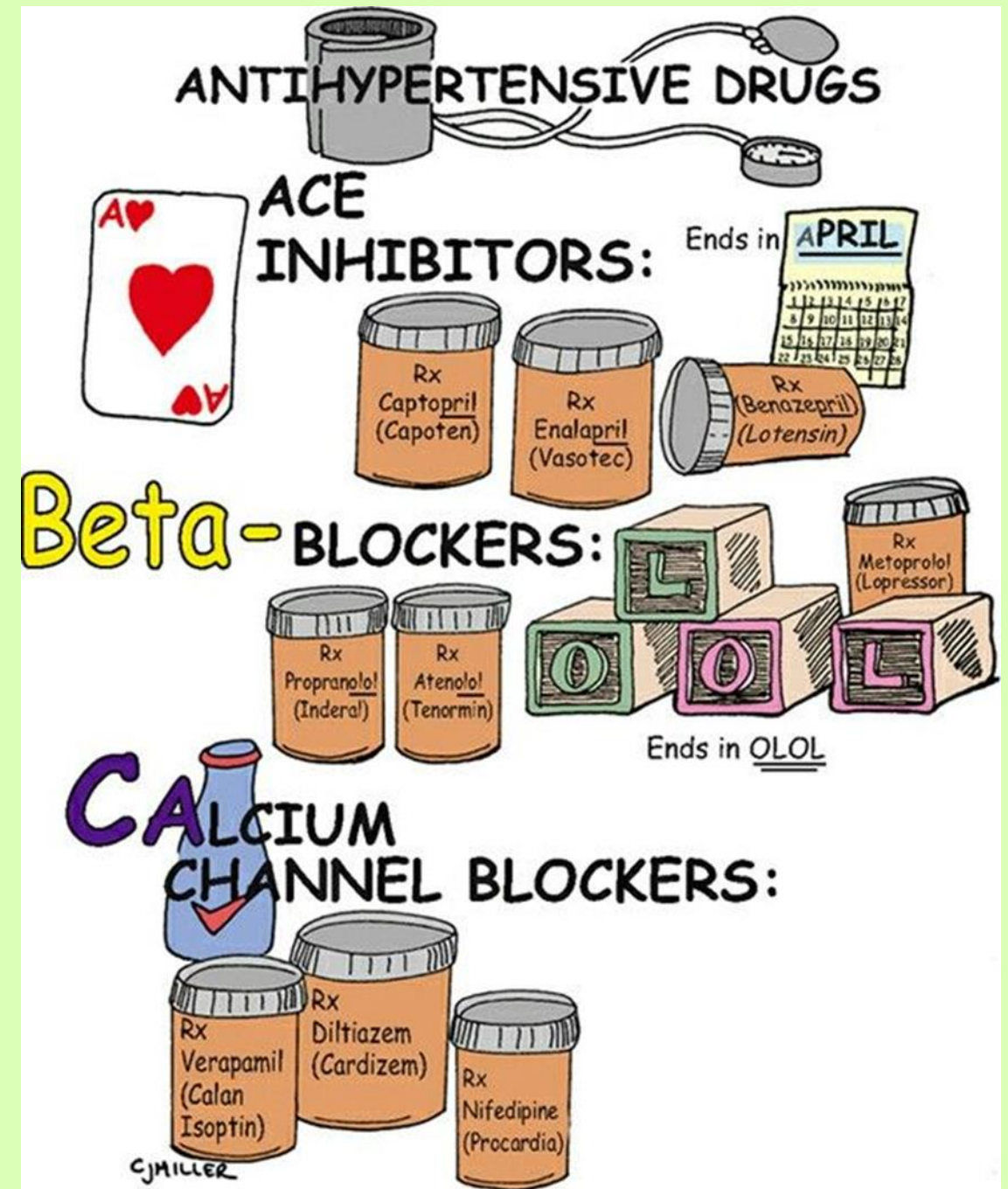
Pharmacological Treatments in Patients with Diabetes



- If office SBP is ≥ 140 mmHg and/or DBP is ≥ 90 mmHg, drug therapy is necessary in combination with non-pharmacological treatment.
- It is recommended to start with a **combination therapy**.
- All available BP-lowering drugs can be used, but evidence strongly supports using a renin-angiotensin system (RAS) inhibitor (ACE-I, ARB), particularly in patients with evidence of end-organ damage (albuminuria and left ventricular hypertrophy).

ACE Inhibitors	ARBs
benazepril (LOTENSIN)	azilsartan (EDARBI)
captopril	candesartan (ATACAND)
enalapril (VASOTEC)	
enalaprilat	eprosartan (TEVETEN)
fosinopril	
lisinopril (PRINIVIL, ZESTRIL)	irbesartan (AVAPRO)
	losartan (COZAAR)
moexipril	olmesartan (BENICAR)
perindopril (ACEON)	
quinapril (ACCUPRIL)	telmisartan (MICARDIS)
ramipril (ALTACE)	
trandolapril (MAVIK)	valsartan (DIOVAN)

- Controlling BP often requires multiple drug therapy with an **RAS inhibitor and a calcium channel blocker (CCB)** or **diuretic**, while the combination of an ACE-I with an ARB is not recommended.
- Consider beta-blockers at any treatment step when specifically indicated, e.g. HF, angina, post-MI, AF, or younger women with or planning pregnancy.
- A **combination of two or more drugs at fixed doses in a single pill** should be considered to improve adherence and to achieve earlier control of BP.



Prescribing patterns:

- Start with dual combination therapy in most patients
- Uptitrate to maximum well tolerated doses and to triple therapy if needed
- **Once daily (preferred in the morning)**
- **Add further drugs if needed**
- **Preferred use of SPCs at any step**



T/TL Diuretic^a

Additional drug classes

General antihypertensive therapy:

- Steroidal MRA
- Loop Diuretic
- Alpha-1 Blocker
- Centrally acting agent
- Vasodilator

Special comorbidities:

- ARNi
- SGLT2i
- Non-Steroidal MRA

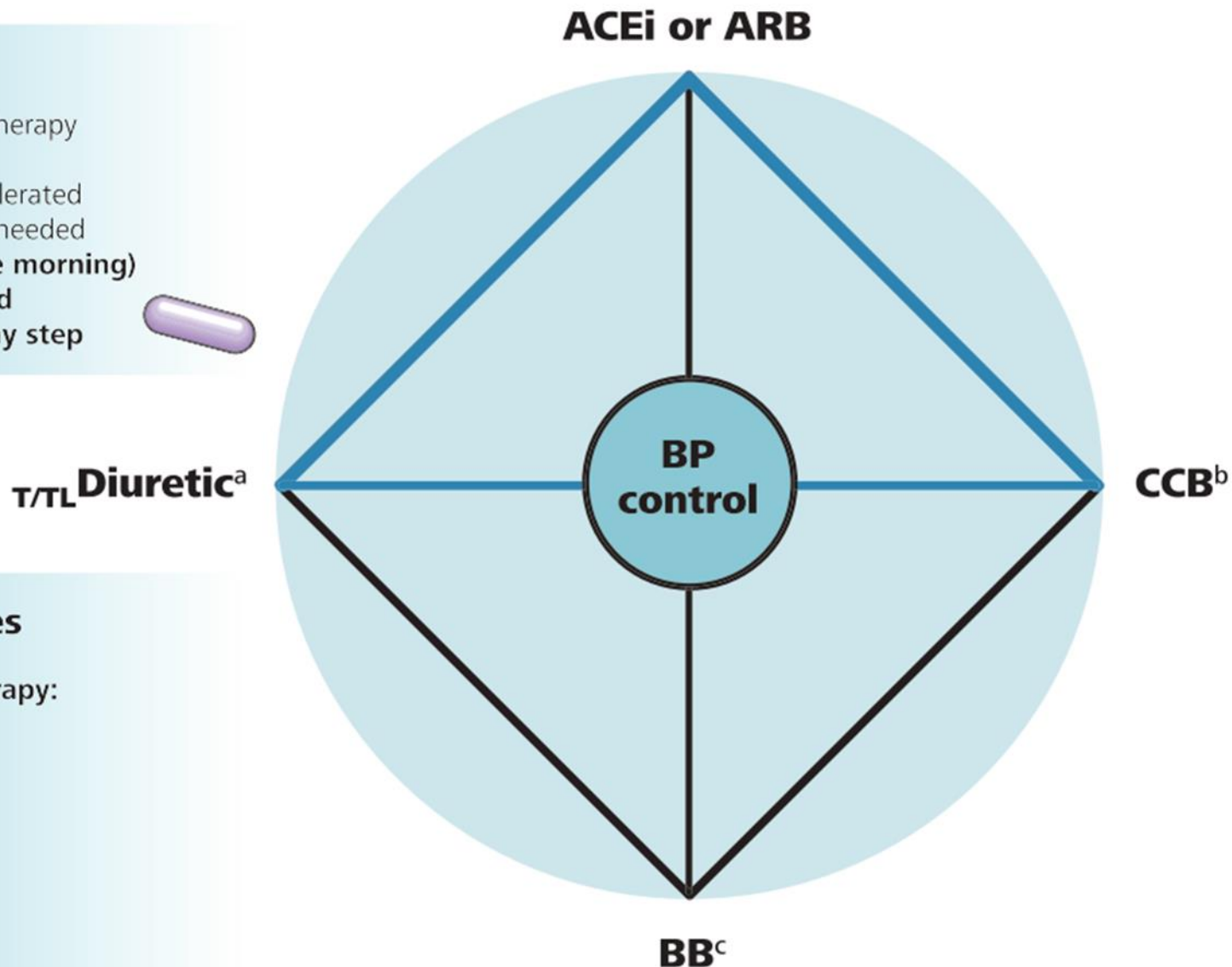


FIGURE 11 Drug classes for BP-lowering therapy. (a) Use of Diuretics: Consider transition to Loop Diuretic if eGFR is between 30 to 45 ml/min/1.73 m². If eGFR <30 ml/min/1.73 m² use Loop Diuretic. (b) Non-DHP CCB should not be combined with BB. (c) BB should be used as guideline directed medical therapy in respective indications or considered in several other conditions (Table 16). Start with dual combination therapy including a RAS-blocker (either ACEi or ARB) plus a T/TL Diuretic or a CCB is recommended (thick blue lines). Triple therapy includes a combination of the three classes as indicated by the blue lines.

Blood pressure changes with glucose-lowering agents

Trials testing [GLP-1 RAs](#) have shown a BP decrease with these drugs, [partly due to weight loss](#).

A sustained decrease in BP was observed with [semaglutide](#) therapy (SBP dose dependent: -1.3 to -2.6 mmHg) with a slight increase in heart rate (+2 to 2.5 bpm).

[SGLT2 inhibitors](#) induced a larger BP decrease than did GLP-1 RAs without changing heart rate.

SGLT2 inhibitors were associated with an average reduction of 3.6/1.7 mmHg (systolic/diastolic) in 24h ambulatory BP, which is comparable with efficacy of low-dose hydrochlorothiazide.

GLP-1 Receptor Agonists

Exenatide	Byetta
Exenatide, Extended Release	Bydureon, Bydureon BCise
Liraglutide	Victoza
Semaglutide	Ozempic
Dulaglutide	Trulicity
Lixisenatide	Adlyxin

Drug	Administration
Dapagliflozin	Once daily
Canagliflozin	Once daily
Empagliflozin	Once daily

Anti-hypertensive drug treatment is recommended for people with diabetes when office BP is $\geq 140/90$ mmHg. ^{196,202,234,235}	I	A
It is recommended to initiate treatment with a combination of a RAS inhibitor and a CCB or thiazide/thiazide-like diuretic. ^{196,213–216,218,241}	I	A
Home BP self-monitoring should be considered in patients with diabetes on anti-hypertensive treatments to check that BP is appropriately controlled. ²⁴²	IIa	B
24 h ambulatory blood pressure monitoring should be considered to assess abnormal 24 h BP patterns, including nocturnal hypertension and reduced or reversed nocturnal BP dipping, and to adjust anti-hypertensive treatment. ²⁴³	IIa	B

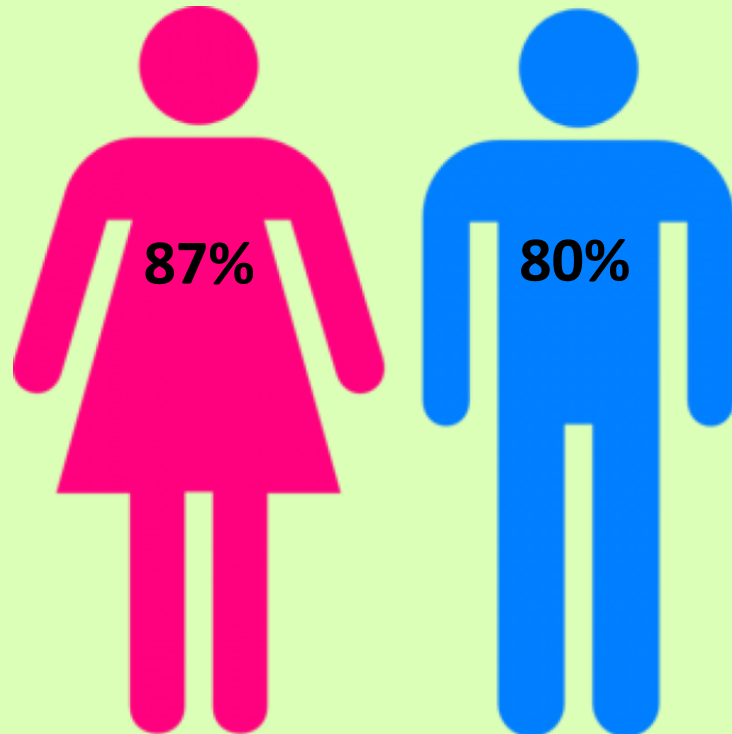
Sex-specific aspects

- Women usually show greater differences in BP and higher proportions of hypertension than men already at diagnosis of T2DM compared with women and men without T2DM, and worse BP control thereafter.
- Child-bearing potential or during pregnancy, when some drugs, such as RAS blockers, can have adverse effects on the fetus, especially in early gestation.

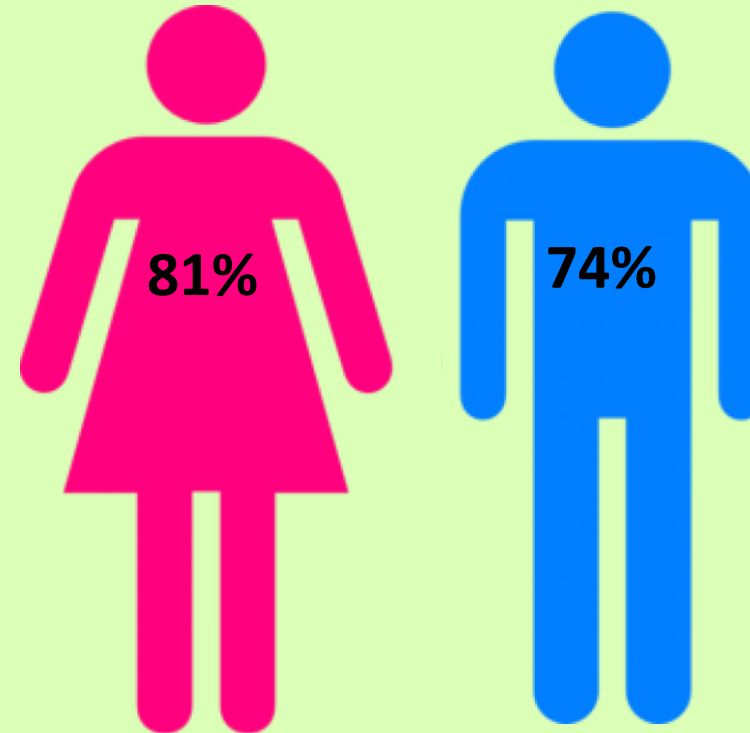
There is some evidence from RCTs that BP targets during pregnancy should range from 110 to 135 mmHg for SBP and 80 to 85 mmHg for DBP. This is also supported by the recent CHAP (Chronic Hypertension and Pregnancy) study of mild chronic hypertension in pregnancy, where 16% of the pregnant women had diabetes.

ESC/EUR Observational Research Programme (EORP) EUROASPIRE surveys

History of DM



**Newly diagnosed
with DM**



Our patient was recommended to:

- 1. Lose weight with one of the standard diets and regular exercise**
- 2. Single-pill combination anti-hypertensive medication was prescribed for her with a combination of valsartan 80mg/amlodipine 5mg**
- 3. Empagliflozin 10mg daily was also added to her medication for better control of blood glucose and also BP (based on blood sugar data)**
- 4. She was recommended to turn back for the next visit 2 weeks later with a chart of home BP monitoring**

Thank You for Your Attention

