

distinguished research career outside coronary interventions, showing that under repeated and chronic ischaemic conditions, heart cells change their phenotypes, accumulating glycogen and losing contractile proteins, and has undertaken stem cell research for acute myocardial infarction and heart failure. The ESC Congress, he maintains, provides the perfect opportunity for interventional cardiologists to network with other colleagues. ‘You gain new insights that help to give you a different appreciation of your work when you get home,’ he says. ‘With

the ever-increasing powerful synergy between device and drug-based therapies, it offers a unique opportunity to learn about the latest progress in pharmacotherapy’.

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Hypertension Guidelines

How the recent 2017 American Guidelines for hypertension in adults differ from the 2013 ESH/ESC Guidelines

At the last meeting of the American Heart Association (AHA) in November 2017, the new 2017 *High Blood Pressure Clinical Practice Guidelines* produced by the American College of Cardiology (ACC) and AHA were presented. They were published simultaneously in *Hypertension* and in the *Journal of the American College of Cardiology*.¹ These new recommendations provide major conceptual changes when compared to JNC7 guidelines or the JNC8 committee report.

In the present analysis, we shall discuss the rather major differences between 2017 ACC/AHA guidelines and those published by the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH) in 2013,² knowing that these two latter societies will provide revised recommendations in 2018.

The major differences concern:

- (1) The changes in blood pressure (BP) classification, which affects the prevalence of hypertension in the population.

- (2) A larger use of out-of-office BP measurements to diagnose hypertension as well as white-coat and masked hypertension and to monitor treatment.
- (3) The greater credit given to non-pharmacological approaches.
- (4) The lower BP levels to start treating hypertension with drugs in cardiovascular (CV) risk patients.
- (5) The lower BP goals for treated hypertensive patients.

Let’s examine these differences point by point:

1. A new classification for hypertension

The biggest change of the 2017 ACC/AHA guidelines is the revision of the BP categories in hypertension. *Figure 1* illustrated these differences.

BP Category	ESH/ESC		BP Category	ACC/AHA 2017	
	Systolic	Diastolic		Systolic	Diastolic
Optimal	<120	and	<80		
Normal	120-129	and/or	80-84	Normal	<120 and <80
High normal	130-139	and/or	85-89	Elevated	120-129 and <80
Grade 1 Hypertension	140-159	and/or	90-99	Stage 1	130-139 or 80-89
Grade 2 Hypertension	160-179	and/or	100-109	Stage 2	≥140 or ≥90
Grade 3 Hypertension	≥180	and/or	≥110		
Isolated systolic hypertension	≥140	and	<90		

Figure 1 Comparison of blood pressure categories according to the European Society of Hypertension/European Society of Cardiology 2013 guidelines and American College of Cardiology/American Heart Association 2017. Values are in mmHg.

In contrast to all previous international guidelines the normal BP is set at <120/80 mmHg and hypertension Stage 1 starts at BP levels above 130/80 mmHg rather than 140/90 mmHg as in actual European guidelines. Of note, in the ACC/AHA classification, there is no Stage 3 and the concept of isolated systolic hypertension, as mostly observed in elderly patients has disappeared. In fact, there is no mention of isolated systolic hypertension across the 2017 ACC/AHA document.

This new classification will have a huge impact on the prevalence of hypertension in populations as well as on the number of patients who may need to receive antihypertensive therapy to normalize their BP. Indeed, when applied to the National Health and Nutrition Examination Survey 2011–14 data, this new classification will increase the crude prevalence of hypertension in the American population by 14–46% of the general population. Above the age of 65, at least 75% of men and women are hypertensive. However, the number of persons to treat with an antihypertensive medication should increase by only 2–3% because most patients with BP below 130/80 mmHg should receive a non-pharmacological treatment as will be discussed below.³

2. Out-of-office BP measurements

Out-of-office BP measurements have been recommended by the ESH/ESC guidelines for many years to confirm the diagnosis of hypertension, to identify the type of hypertension, to detect hypotensive episodes, and to maximize the prediction of CV risk (Level of evidence 2A). These guidelines recommend both home BP monitoring and ambulatory BP monitoring depending on the availability and costs (Level of evidence 2B).

In the 2017ACC/AHA guidelines, there is a much greater emphasis on the use of out-of-office BP measurements with a 1A recommendation. As stated, *Out-of-office BP measurements are recommended to confirm the diagnosis of hypertension and for titration of BP-lowering medication, in conjunction with telehealth counselling or clinical interventions.*

As indicated in European guidelines, BP values obtained in the office or out-of-office cannot be considered as equivalent. Therefore, different cut-off values must be used to define hypertension depending on the method used to measure BP. In the new American guidelines, authors do not propose different cut-offs for the definition of hypertension but rather propose corresponding values for different levels of BP. Interestingly, they consider that the white-coat effect is nearly absent in subjects with an office BP of 130/80 mmHg and below. This may be true but not necessarily always the case. *Figure 2* below shows the corresponding values for the various conditions of BP measurements as defined in the ACC/AHA guidelines and the definitions of hypertension according to the three conditions in the ESH/ESC guidelines 2013.

Both guidelines insist on the detection of white-coat and masked hypertension with these measurements. Masked hypertension is of particular concern, as it is associated with a high risk of CV complications.

3. Non-pharmacological treatments

All international guidelines recommend non-pharmacological approaches in the early stages of hypertension and they insist on maintaining the

Clinic BP	Home BP monitoring	Ambulatory BP monitoring: day
ACC/AHA^a		
120/80	120/80	120/80
130/80	130/80	130/80
140/90	135/85	135/85
160/100	145/90	145/90
ESH/ESC 2013^b		
>140/90	>135/85	>135/85

Figure 2 Comparative clinic, home and daytime ambulatory blood pressures according to the ACC/AHA 2017 and the ESH/ESC 2013 guidelines. All values are mmHg. ^aIndicates comparative values; ^bindicates hypertension definitions with the three methods.

lifestyle changes when drug therapy is initiated. In the context of the new classification proposed by the ACC/AHA 2017 guidelines, these non-pharmacological approaches, which include losing weight, eating the DASH diet (*Figure 3*), reducing salt intake and increasing potassium intake, increasing physical activity and reducing in alcohol intake if necessary, will take an even greater place in today's management of hypertensive patients.

Indeed, the authors are conscious that a large number of previously 'normotensive' subjects will now be considered as having an elevated BP or even Stage 1 hypertension with a low CV risk. For these subjects, they recommend applying non-pharmacological therapy and to reconsider the situation after 3 and 6 months. However, they do not specify the therapeutic attitude if one observed no improvement after 6 months, which is often the case. What should patients do since they are labelled as hypertensive? Should they start a drug therapy even if they have a low CV risk? European Society of Hypertension/European Society of Cardiology guidelines clearly state that these approaches have a relatively low success rate and that many of these lifestyle changes are not maintained over time. Thus, the ACC/AHA might overestimate the impact of lifestyle changes at an early hypertensive stage. Consequently, this may lead to greater percentage of hypertensive patients receiving drug therapies, whatever the CV risk profile.



Figure 3 Healthy food as recommended in the DASH diet.

4. Lower BP levels to start treating hypertension with drugs in CV risk patients

The treatment of hypertension should be based not only on BP values but also according to the level of the patients' CV risk. Thus, the 2013 ESH/ESC guidelines recommend initiating antihypertensive drug treatment in patients with Grade 1 hypertension (140–159/90–99 mmHg) at low to moderate risk, when BP is within this range at several repeated visits or elevated by ambulatory BP criteria, and remains within this range despite a reasonable period of time with lifestyle measures. In patients with Stage 2 and 3 hypertension, which is associated with higher CV risk, a rapid initiation of therapy is proposed, and elderly patients should be treated when their BP is above 160 mmHg systolic or even lower if they are fit. Physicians can start either with a monotherapy in low-risk patients or with a single pill combination in patients with a higher CV risk.

The same concept prevails also in the ACC/AHA 2017 guidelines but at much lower BP values and with a strong recommendation to use non-pharmacological therapies in hypertensive patients with a 10-year CV risk of less than 10% and an elevated or Stage 1 hypertension (BP 130–139/80–89 mmHg). This is supposed to limit the initiation of drug therapy in subjects previously considered as normotensive. With higher BP values and a higher CV risk, prompt initiation of drug therapy with single combination is also recommended.

5. Lower BP goals for treated hypertensive patients

One obvious consequence of changing the classification of hypertension is that targets defining an adequate BP control are changing as well. In the 2013 ESH/ESC guidelines, BP targets are well defined with specific targets taking into account the characteristics of the population. Thus, systolic BP targets are set at <140 mmHg for the general non-elderly hypertensive population, at <150 mmHg in elderly (>80 years) patients but <140 in fit elderly, <140 in patients with diabetes, and <130 mmHg in patients with renal disease and proteinuria. Diastolic BP targets are set at <90 mmHg in all groups except in diabetic where the target is <85 mmHg.

In the new ACC/AHA guidelines, the target BP is <130/80 mmHg for all patients whatever their age and comorbidities. Surprisingly, this uniform BP target is recommended indifferently when evidence

ESH/ESC	Population	Systolic	Diastolic
	General	<140	<90
	Elderly < 80y	<150	<90
	Fit elderly	<140	<90
	Diabetes	<140	<85
	CKD no proteinuria	<140	<90
	CKD +proteinuria	<130	<90
ACC/AHA			
	All populations	<130	<80

Figure 4 Comparative summary of BP targets in hypertension. Numbers area in mmHg. CKD, chronic kidney disease.

supports or does not support this target for example in patients with chronic kidney disease or renal transplantation.

A comparative summary of BP targets in hypertension is presented in Figure 4.

In conclusion, there are some major differences between the last ESH/ESC guidelines and the recent 2017 ACC/AHA guidelines for hypertension in adults.

In the USA, many individuals will suddenly become hypertensive and will need to change or adapt their lifestyle behaviour in order to normalize their BP to less than 120/80 mmHg. Whether this will indeed occur and improve the global health of American people is uncertain and definitely remains to be demonstrated. Whether Europe will follow the same trend will be known at the latest in 2018 when the next ESH/ESC hypertension guidelines will be presented.



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References

References are available as [supplementary material](#) at *European Heart Journal* online.