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EDITORIAL

# What are the appropriate pressure values? United States vs. the rest of the world

## ¿Cuáles son los valores de presión adecuados? Estados Unidos vs. el resto del mundo

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The treatment of arterial hypertension (HTN) continues to be a challenge in physicians' daily practice, despite the existence of national treatment guidelines as well as guidelines from other countries and organizations. Their use is complicated by differences regarding the blood pressure (BP) levels considered to be pathological, the severity, the method for evaluating patient risk, when to begin pharmacological treatment and BP goals. The other persistent barrier is their implementation; even six years after the American Heart Association HTN guidelines were published, they are not properly applied even in the United States[1].

One example of the long road traveled in HTN management in the United States is the evolution of the United States Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC) reports from their initial publication in 1977, which recommended pharmacological treatment with a diastolic pressure (DAP) ≥ 105 mmHg, and in which systolic BP (SAP) was not considered[2], up to the 2017 ACC/AHA HTN Guidelines in which BP values ≥ 130/80 are considered HTN and pharmacological treatment is begun in patients with these figures and moderate cardiovascular risk[3].

The publication of the 2017 HTN guidelines in the United States created a global controversy which the 2018 European Society of Cardiology (ESC) guidelines did not entirely quell[4]. The subsequent publication of the World Health Organization (WHO)[5] and International Society of Hypertension (ISH)[6] guidelines, which were similar to the ESC's, thus created two schools of HTN treatment: the United States vs. the rest of the world.

## Differences in blood pressure values for diagnosing high blood pressure

The first concept is the cut-off point for diagnosing HTN. The ESC/ESH, WHO and ISH Guidelines do not change the reference values which were originally established in the United States 30 years ago by JNCs 3, 4, 5 and 6[7]. On the other hand, the ACC/AHA Guidelines drastically changed their cut-off point, arguing that BP values ≥ 130/80 were associated with more vascular events (Table 1).

## Stage 1 HTN (ACC/AHA) vs. high-normal pressure (ESC/ESH): How different are they really?

The BP values covered by these two classifications are similar, but their names sound radically different. A review of the recommended management for these groups of patients shows similarities between the two guidelines (Table 2).

Thus, the most important message is that, for patients with BP values within these categories, cardiovascular risk should be evaluated to determine the initiation of pharmacological treatment; BP levels do not need to be ≥ 140/90 to begin medications.

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**Table 1.** Differences between the ACC/AHA vs. ESC/ESH guidelines in the cut-off points for diagnosing high blood pressure

| Differences | 2017 ACC/AHA Guidelines | | 2018 ESC/ESH Guidelines | |
|---|---|---|---|---|
| Defining BP values of HTN in different settings | SAP and/or DAP in mmHg | | SAP and/or DAP in mmHg | |
| Office | ≥ 130 | ≥ 80 | ≥ 140 | ≥ 90 |
| Daytime average (ABPM) | ≥ 130 | ≥ 80 | ≥ 135 | ≥ 85 |
| Nighttime average (ABPM) | ≥ 110 | ≥ 65 | ≥ 120 | ≥ 70 |
| 24-hour average (ABPM) | ≥ 125 | ≥ 75 | ≥ 130 | ≥ 80 |
| Average SMBP | ≥ 130 | ≥ 80 | ≥ 135 | ≥ 85 |

**Table 2.** Comparison between Stage I HTN vs. high-normal blood pressure

| | 2017 ACC/AHA | 2018 ESC/ESH |
|---|---|---|
| | Stage I HTN | High-normal BP |
| SAP and/or DAP in mmHg | 130-139 80-89 | 130-139 85-89 |
| Lifestyle modification is recommended to reduce cardiovascular risk | Yes | Yes |
| Pharmacological treatment is recommended for all patients | No | No |
| Pharmacological treatment is determined by the patient's level of cardiovascular risk | Yes | Yes |
| Pharmacological treatment for patients with low cardiovascular risk | No | No |
| Pharmacological treatment for patients with moderate cardiovascular risk | Yes | No |
| Pharmacological treatment for patients with high cardiovascular risk | Yes | Yes |
| Risk scale to use | ASCVD | SCORE |

**Table 3.** Comparison between different hypertension guidelines' treatment goals in mmHg

| Context | ACC/AHA 2017 | ESC/ESH 2018 | ISH 2020 | WHO 2021 |
|---|---|---|---|---|
| Age ≥ 65 years | < 130/80 | 130-140/70-79 | < 140/80 | < 140/90 |
| Post-stroke | < 130/80 | < 130/70-79 (or less if tolerated by the patient) | < 130/80 or < 140/80 in the elderly | < 130/80 |
| Diabetes mellitus | < 130/80 | < 130/70-79 (or less if tolerated by the patient) | < 130/80 or < 140/80 in the elderly | < 130/80 |
| Chronic kidney failure (GFR) < 60 ml/min) | < 130/80 | < 130/70-79 | < 130/80 or < 140/80 in the elderly | < 130/80 |
| Coronary disease | < 130/80 | < 130/70-79 (or less if tolerated by the patient) | < 130/80 or < 140/80 in the elderly | < 130/80 |

All the previously mentioned guidelines[3-6] recommend pharmacological treatment in patients with BP ≥ 140/90.

One very interesting document is the harmonization published in 2022 by European and American authors[8], in which they also consider that, in general, there are more points of agreement than disagreement, such as:

– The recommendation to begin treatment with one of four classes of antihypertensive medications: calcium channel blockers, angiotensin converting enzyme

inhibitors, angiotensin receptor blockers and thiazide or thiazide-like diuretics.
– Both guidelines recommend the early use of fixed-dose, single-pill combinations.
– Both guidelines agree that lifestyle changes are the fundamental basis of HTN treatment.

## ACC/AHA (USA) treatment goals vs. ESC/ESH, ISH, WHO (the rest of the world)

There is more agreement than disagreement on this point; the fundamental difference is that the ACC/AHA guidelines have strict goals, while the other guidelines refer to goals as tolerated by the individual patients[3-6] (Table 3).

## Conclusions

In light of the rapprochement between the positions of the United States and European guidelines which is evident in the 2022 harmonization document[8] written by ESC and ACC/AHA authors, it would be ideal to reach a universal definition and classification of HTN, similar to the fourth definition of myocardial infarction[9]. This would establish a common language which would facilitate all the research, education and implementation processes of the HTN treatment guidelines, as the main objective should be to decrease cardiovascular mortality and morbidity worldwide.

## Conflicts of interest

None.

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