# BHS Classification of BP Levels

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic BP (mmHg)</th>
<th>Diastolic BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal BP</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Normal BP</td>
<td>&lt;130</td>
<td>&lt;85</td>
</tr>
<tr>
<td>High Normal BP</td>
<td>130-139</td>
<td>85-89</td>
</tr>
<tr>
<td>Grade 1 Hypertension (mild)</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Subgroup: Borderline</td>
<td>140-149</td>
<td>90-94</td>
</tr>
<tr>
<td>Grade 2 Hypertension (moderate)</td>
<td>160-179</td>
<td>100-109</td>
</tr>
<tr>
<td>Grade 3 Hypertension (severe)</td>
<td>≥180</td>
<td>≥110</td>
</tr>
<tr>
<td>Isolated Systolic Hypertension</td>
<td>≥140</td>
<td>&lt;90</td>
</tr>
<tr>
<td>Subgroup: Borderline</td>
<td>140-149</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>

This classification equates with that of the WHO/ISH (2) and is based on clinical BP values. If SBP and DBP fall into different categories the higher value should be taken for classification.
Blood pressure measurement by standard mercury sphygmomanometer or semi-automated device

- Follow BHS guidelines on technique (15)
- Use device with validated accuracy, that is properly maintained and calibrated
- Measure sitting BP routinely: standing BP in elderly or diabetic patients
- Remove tight clothing, support arm at heart level, ensure hand relaxed
- Use cuff of appropriate size
- Lower mercury column slowly, by 2mm per second
- Read BP to the nearest 2 mmHg
- Measure diastolic as disappearance of sounds (phase V)
- Take the mean of at least two readings, more recordings are needed if marked differences between initial measurements are found
- Use the average for several visits when estimating cardiovascular risk in mild hypertension
# BP cuff sizes for mercury sphygmomanometer, semi-automatic and ambulatory monitors

<table>
<thead>
<tr>
<th>Indication</th>
<th>Bladder width x length (cm)</th>
<th>Arm Circumference (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Adult/Child</td>
<td>12 x 18</td>
<td>&lt;23</td>
</tr>
<tr>
<td>Standard Adult</td>
<td>12 x 26</td>
<td>&lt;33</td>
</tr>
<tr>
<td>Large Adult</td>
<td>12 x 40</td>
<td>&lt;50</td>
</tr>
<tr>
<td>Adult Thigh Cuff</td>
<td>20 x 42</td>
<td>&lt;53</td>
</tr>
</tbody>
</table>

Standard cuffs are sometimes recommended (size 12 x 35cm) but can result in problems with overcuffing. The BHS recommends cuff size is selected on arm circumference.
Threshold levels of BP for the diagnosis of Hypertension according to measurement method

<table>
<thead>
<tr>
<th></th>
<th>SBP (mmHg)</th>
<th>DBP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>≥140</td>
<td>≥90</td>
</tr>
<tr>
<td>Self/home BP Monitoring</td>
<td>&gt;135</td>
<td>&gt;85</td>
</tr>
<tr>
<td>Ambulatory BP Monitoring Day</td>
<td>&gt;135</td>
<td>&gt;85</td>
</tr>
<tr>
<td>Ambulatory BP Monitoring Night</td>
<td>&gt;120</td>
<td>&gt;75</td>
</tr>
<tr>
<td>Ambulatory 24 hr BP Monitoring</td>
<td>&gt;130</td>
<td>&gt;80</td>
</tr>
</tbody>
</table>

1. These figures do not necessarily equate with the need for antihypertensive drug treatment to be started and therapy must be based on overall CV risk as well as absolute BP levels. Antihypertensive treatment should however, be initiated in people with sustained office SBP ≥160mmHg or sustained DBP ≥100mmHg irrespective of other risk factors.

2. Lower levels of BP to initiate drug therapy may be considered in some instances eg post-stroke, diabetes

3. The highest value of SBP or DBP should be used for classification, whichever method measurement method is used
Potential indications for Ambulatory Blood Pressure Monitoring

• When BP shows unusual variability
• In excluding white coat hypertension
• In helping with the assessment of patients with borderline hypertension
• In identifying nocturnal hypertension
• In assessing patients whose hypertension has been resistant to drug therapy (defined as BP >150/90mmHg on 3 or more antihypertensive drugs)
• As a guide to determining the efficacy of drug treatment over 24 hours
• In diagnosing and treating hypertension in pregnancy
• In diagnosing hypotension and postural hypotension
Suggested target blood pressures during antihypertensive treatment

Systolic and diastolic should both be attained eg <140/85 mmHg means less than 140 mmHg systolic and less than 85 mmHg diastolic

<table>
<thead>
<tr>
<th>Clinic BP (mmHg)</th>
<th>Mean day-time ABPM or home BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Diabetes</td>
</tr>
<tr>
<td>Optimal BP</td>
<td>&lt;140/85</td>
</tr>
<tr>
<td>Audit Standard</td>
<td>&lt;150/90</td>
</tr>
</tbody>
</table>

Audit standard reflects the minimum recommended levels of BP control

Despite best practice, the Audit Standard will not be achievable in all treated hypertensives
White Coat Hypertension

Definition
- Blood pressure $\geq 149/90$ mmHg when measured in office
- Normal daytime ambulatory pressure $<135/85$ mmHg

Prevalence of white coat hypertension
- 10-30% of general population
- Common in elderly people and pregnant women

Risks
- Less than from sustained hypertension
- Probably small risk when compared with people with normal blood pressure
- Possibly a precursor to hypertension

Clinical Implications
- No clinical characteristics assist in diagnosis
- Must be considered in people newly diagnosed with hypertension
- Should be considered before drug treatment is prescribed (could lead to fewer drugs being prescribed)
- Must be placed in context of the overall risk profile
- Should reassure patients, employers and insurers that risk from white coat hypertension is low or absent
- Patients need follow up re-monitoring
Considerations for anti-hypertensive treatment in older people

- Absolute benefit from treatment is greater in the elderly than younger age groups
- Ages 65-79 years treat if SBP ≥160mmHg and/or DBP is ≥100mmHg or if BP >140 and/or 90mmHg and CV risk is >2.0% per annum or TOD present
- Ages ≥80 years newly diagnosed with TOD and/or other risk factors – treatment probably of benefit
- Ages ≥80 years newly diagnosed without TOD/risk factors – benefit of treatment unknown
- Ages ≥80 years on treatment with TOD/risk factors – treatment should probably be continued
- Ages ≥80 years on treatment without TOD or other risk factors – benefits of treatment unknown
Controlling CV risk in the elderly

• Level of BP reduction is more important than specific drug used in older hypertensives whether diabetic or non-diabetic. BP targets for those aged ≤80 years are similar to those for younger patients.

• Other CV risk factors must be addressed and aspirin considered for primary and secondary CV risk prevention.

• Non-pharmacological measures should be considered in all patients and used in conjunction with anti-hypertensive drugs.

• Thiazide diuretics remain first line agents of choice in this age group though for those with ISH or are diuretic intolerant, CCB’s are a good alternative. α- and β-blockers are unproven as effective initial agents in most older people.

• Two or more anti-hypertensive drug classes will be needed in the majority of patients, fixed dose combinations may improve compliance.
Cerebrovascular Disease

• Increasing BP levels are a significant risk factor for primary stroke and recurrence even in the very elderly

• Following acute stroke BP levels are frequently raised and fall spontaneously over the next few days. Both high and low BP levels immediately post-stroke are associated with an adverse prognosis

• There is no evidence yet as to whether anti-hypertensive drugs should be started immediately after stroke or if current medication should be continued in the acute post-ictal phase

• Diuretics and/or ACEIs reduce the risk of stroke recurrence and major CV events by about 20-30% in those with a history of stroke or TIA whether normotensive or hypertensive at follow-up

• To realise the full potential in both primary and secondary stroke prevention, other risk factors must be treated