

British & Irish Hypertension Society (BIHS): Blood Pressure Measurement Working Party

Statement on the diagnosis of hypertension in obese patients with a large or very large arm circumference

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A recent diagnostic accuracy review by Irving and et al in BMJ Open (2016 Nov 3;6(11):e012429) looked at the accuracy of different methods of blood pressure measurement compared against a range of reference standards for the diagnosis of hypertension in obese patients with a large arm circumference. The study found that, compared with the reference test of invasive BP, a correctly fitting upper arm BP cuff had a sensitivity of 0.87 (0.79 to 0.93) and a specificity of 0.85 (0.64 to 0.95). Compared with the reference test of a correctly fitting upper arm cuff, BP measurement at the wrist had a sensitivity of 0.92 (0.64 to 0.99) and a specificity of 0.92 (0.85 to 0.87). Measurement with an incorrectly fitting standard cuff had a sensitivity of 0.73 (0.67 to 0.78) and a specificity of 0.76 (0.69 to 0.82). Measurement at the forearm had a sensitivity of 0.84 (0.71 to 0.92) and a specificity 0.75 of (0.66 to 0.83).

Current BIHS guidance recommends **“contacting manufacturers if a large upper arm cuff does not fit in order to obtain an extra-large cuff”** if the cuff is too small. The review supported this statement. Compared to the reference test of invasive blood pressure, a correctly fitting upper arm blood pressure cuff is sufficiently sensitive and specific for the diagnosis of hypertension in obese patients. This holds true for patients with BMI >35 but it was not possible to undertake a subgroup analysis of those with arm circumference >40 or 50 cm. There was good evidence that an incorrectly fitting standard cuff was not as accurate as a correctly fitting cuff supporting the current BIHS statement that **“The bladder of the cuff should fit around at least 80% of the arm but not more than 100%. A cuff that does not fit properly will not give an accurate reading so it is important to use the right size.”**

No guidance is offered in relation to whether the use of wrist / forearm blood pressure measurement is appropriate. The review found wrist blood pressure measurement to be more accurate than forearm measurement compared to the reference standard of a correctly fitting cuff. Furthermore, the agreement between wrist and upper arm blood pressure measurement with a correctly fitting cuff for both systolic fell within the +/- 3mmHg [BHS standard] and +/- 5mmHg margin of error for clinically relevant difference. On the basis of the findings the BIHS recommends that **“If a correctly fitting cuff cannot be fitted or is unavailable or cannot be applied then wrist blood pressure measurement, with the wrist held at the level of the heart, is the best alternative means of blood pressure measurement”**.