Canadian Hypertension Society Guidelines for Ambulatory Blood Pressure Monitoring

Martin G. Myers, R. Brian Haynes, and Simon W. Rabkin

The Canadian Hypertension Society has developed guidelines for the use of ambulatory blood pressure (BP) monitoring in clinical practice. Published articles with the best available levels of evidence were used to support the following recommendations:

• Physicians should only use ambulatory BP monitoring devices that have been validated independently using established protocols.
• A decision to withhold drug therapy based upon the ambulatory BP should take into account normal values for 24-h and awake ambulatory BP.
• Based upon studies on prognosis and a clinical trial based upon BP control as an outcome, ambulatory BP monitoring should be considered for untreated patients whenever an office-induced increase in BP is suspected.
• Ambulatory BP monitoring should be considered for treated patients suspected of having an office-induced increase in BP, including individuals with apparent resistance to drug therapy, symptoms suggestive of hypotension, and fluctuating office BP readings.
• Based upon studies on prognosis, changes in nocturnal BP should be taken into account in any decision to withhold drug therapy based upon the ambulatory BP.
• Further studies are required to determine whether the clinical benefit of antihypertensive therapy is more closely related to ambulatory or office BP. Am J Hypertens 1999;12:1149–1157.

© 1999 American Journal of Hypertension, Ltd.

KEY WORDS: Ambulatory blood pressure, hypertension, blood pressure diagnosis.
acceptance of the initial guidelines was given at the Society’s Consensus Conference in June 1998, with this revised document receiving final approval in late 1998.

METHODS

In preparation for this review, a literature search using MEDLINE was conducted back to 1976 under several headings including blood pressure (BP) diagnosis, ABP, hypertension, and white coat hypertension. In addition, the first author had access to an extensive file on ABP monitoring derived from major hypertension publications and other general medical journals since 1985. Bibliographies of key scientific articles and review articles were also used to identify other relevant papers.

Because of the large volume of publications on various aspects of ABP monitoring during the past decade, the scientific quality was evaluated according to the quality of supporting evidence. Articles with the best available levels of evidence were used to support conclusions. Articles concerning diagnosis and prognosis were evaluated using published criteria and criteria were developed for reproducibility and accuracy (Table 1).

One author (M.G.M.) retrieved and reviewed all relevant studies according to the criteria outlined in Table 1. The other two authors used the same criteria to review any articles with unclear methodology or results and all articles used to support the recommendations. The degree of interobserver agreement was not evaluated. Final recommendations were based upon a grading system that incorporated the best available evidence (Table 2).

ACCURACY OF AMBULATORY BLOOD PRESSURE DEVICES

There have been two protocols recognized for the assessment of ABP devices—The Association for the Advancement of Medical Instrumentation (AAMI) and the British Hypertension Society (BHS). O’Brien et al have recently reviewed the results of various ABP devices using AAMI or BHS criteria. Fourteen devices were evaluated by both protocols; nine were found to meet the necessary requirements (Table 3), including commonly used units such as the SpaceLabs models 902025 and 90207. Conclusion: ABP devices have been validated for accuracy by independent investigators using established protocols compared with standardized mercury sphygmomanometer readings (level I).

REPRODUCIBILITY OF AMBULATORY BLOOD PRESSURE READINGS

Several studies have examined the reproducibility of ABP readings over periods of ≤2 years. In the HAR-

<table>
<thead>
<tr>
<th>TABLE 1. LEVELS OF EVIDENCE FOR RATING STUDIES OF (A) DIAGNOSIS, (B) PROGNOSIS AND (C) REPRODUCIBILITY AND ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Levels of evidence for rating studies of diagnosis</td>
</tr>
<tr>
<td>I. a. Independent interpretation of test procedure (without knowledge of result of diagnostic standard).</td>
</tr>
<tr>
<td>b. Independent interpretation of diagnostic standard (without knowledge of result of test procedure).</td>
</tr>
<tr>
<td>c. Selection of patients or subjects who are suspected but not known to have the disorder of interest.</td>
</tr>
<tr>
<td>d. Reproducible description of both the test and the diagnostic standard.</td>
</tr>
<tr>
<td>e. At least 50 patients with and 50 without the disorder.</td>
</tr>
<tr>
<td>II. Meets four of the criteria in I.</td>
</tr>
<tr>
<td>III. Meets three of the criteria in I.</td>
</tr>
<tr>
<td>IV. Meets two of the criteria in I.</td>
</tr>
<tr>
<td>V. Meets one of the criteria in I.</td>
</tr>
<tr>
<td>VI. Meets none of the criteria in I.</td>
</tr>
<tr>
<td>B. Levels of evidence for rating studies of prognosis</td>
</tr>
<tr>
<td>I. a. Inception cohort.</td>
</tr>
<tr>
<td>b. Reproducible inclusion and exclusion criteria.</td>
</tr>
<tr>
<td>c. Follow-up of at least 80% of subjects.</td>
</tr>
<tr>
<td>d. Statistical adjustment for extraneous prognostic factors (confounders).</td>
</tr>
<tr>
<td>e. Reproducible descriptions of outcome measures.</td>
</tr>
<tr>
<td>II. Inception cohort but meets only three of the other criteria in I.</td>
</tr>
<tr>
<td>III. Inception cohort but meets only two of the other criteria in I.</td>
</tr>
<tr>
<td>IV. Inception cohort but meets only one of the other criteria in I.</td>
</tr>
<tr>
<td>V. Inception cohort but meets none of the other criteria in I.</td>
</tr>
<tr>
<td>VI. Meets none of the criteria in I.</td>
</tr>
<tr>
<td>C. Levels of evidence for reproducibility and accuracy</td>
</tr>
<tr>
<td>I. Independent assessment of ABP versus a diagnostic standard (e.g. mercury sphygmomanometer)</td>
</tr>
<tr>
<td>II. Provision of confidence intervals around estimates of accuracy and reproducibility</td>
</tr>
</tbody>
</table>

VEST Trial, 508 participants had 24-h ABP recordings performed 3 months apart using two devices validated by both AAMI and BHS criteria. ABP was more

<table>
<thead>
<tr>
<th>TABLE 2. GRADING SYSTEM FOR RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. The recommendation is based on one or more studies at level I.</td>
</tr>
<tr>
<td>B. The best evidence available was at level II.</td>
</tr>
<tr>
<td>C. The best evidence available was at level III.</td>
</tr>
<tr>
<td>D. The best evidence available was lower than level III and included expert opinion.</td>
</tr>
</tbody>
</table>
reproducible than the office BP. Mean daytime and nighttime ABP measurements were also similar for recordings taken 3 months apart with a very small difference (−0.4 mm Hg) seen with the mean nighttime diastolic BP ($P = .02$).

Coats et al.\textsuperscript{10} have compared office and mean daytime ABP readings 1 month apart in 100 untreated hypertensive patients receiving placebo therapy. After 1 month, the mean office BP was 2.8 mm Hg lower than baseline, whereas the mean daytime ABP was only 1.1 mm Hg lower. The standard deviation of the difference between readings was 12.6 mm Hg for the office BP versus 6.5 mm Hg for the ABP. The coefficient of correlation was also higher for the ABP ($r = .083$) versus the office BP ($r = .59$).

Asagami et al.\textsuperscript{11} have recorded ABP and casual office BP three times over a 2-year period in 54 individuals with borderline hypertension. Mean (± SEM) 24-h ABP was similar at 1, 2, and 3 years (130 ± 10/78 ± 7, 130 ± 10/79 ± 7, and 130 ± 10/78 ± 7 mm Hg), respectively. Using Bland-Altman analysis\textsuperscript{12} with confidence intervals (CI) and standard deviations (SD) of the difference, Asagami et al.\textsuperscript{11} showed that the 24-h ABP was more reproducible than the clinic BP. Prasad et al.\textsuperscript{13} performed 48-h ABP recordings in 50 hypertensive patients. The ABP during the first 2 h of the recording was higher ($P = .02/.01$) compared to that of h 24 to 26, with the difference for h 1 versus h 25 being 10.0/7.8 mm Hg and for h 2 versus h 26 being 5.9/4.9 mm Hg. The higher values at the start of the first day’s recording were considered to represent a white coat or accommodation effect. This phenomenon has only been noted when two ABP recordings have been performed on consecutive days without interruption. When two ABP recordings were performed with an intervening period, there was no difference between mean hourly readings during the first 2 h of each 24-h period. Conclusion: Mean 24-h, daytime, and nighttime ABP are more reproducible than office or clinic BP taken by manual sphygmonanometry.\textsuperscript{9–11} (level I). Twenty-four-hour ABP is not subject to the regression to the mean phenomenon, as observed with repeated BP measurements taken by mercury sphygmonanometry\textsuperscript{9–11} (level I).

NORMAL VALUES FOR AMBULATORY BLOOD PRESSURE

Numerous studies have compared ABP and office BP in an attempt to establish the “normal range” for ABP. It should be noted that any reference values for a normal ABP are somewhat arbitrary in that BP readings in a population, regardless of office or ambulatory, represent a continuum with no clear separation between normal and abnormal.

The American Society of Hypertension (ASH) Ad Hoc panel\textsuperscript{14} examined the issue of normal values and made recommendations for classifying ABP as probably normal, borderline, and probably abnormal based upon data in the literature. The ASH report,\textsuperscript{14} based upon epidemiologic\textsuperscript{15–17} data, includes separate values for the 24-h, awake, and asleep ABP (Table 4). Estimates of normality for 24-h ABP have recently been validated in a population-based sample, using data on clinical outcomes in 1542 subjects followed for a mean of 5.1 years.\textsuperscript{18} The relative risk of overall mortality and cardiovascular mortality increased with 24-h ABP $\geq$ 134/78 mm Hg. The relative hazard for systolic BP and overall mortality (2.36;95% CI 1.17–4.77) and cardiovascular mortality (4.61;95% CI 1.35–5.66) were statistically significant ($P < .05$) versus the reference BP (the quintile with the lowest mortality). The corresponding relative hazard for diastolic BP was 1.57 (95% CI 0.8–2.91) for overall mortality and 3.39 (95% CI 1.09–10.57) for cardiovascular mortality ($P < .05$).

Verdecchia et al.\textsuperscript{19} have defined white coat hypertension using a clinic-based population with mean office readings $\geq$ 140/90 mm Hg. Based upon data (Table 5) derived from 95% CI, a mean daytime ABP $< 136/87$ mm Hg for men and $< 131/86$ mm Hg for women identified individuals with a high office and

### Table 3. Difference in BP between Standard and Test Device (mmHg)

<table>
<thead>
<tr>
<th>Grade</th>
<th>$\leq 5$</th>
<th>$\leq 10$</th>
<th>$\leq 15$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>B</td>
<td>65</td>
<td>85</td>
<td>95</td>
</tr>
<tr>
<td>C</td>
<td>45</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>D</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

British Hypertension Society Blood Pressure Grading system (Based on Cumulative Percentage of Readings)

* Asterisk indicates worse than grade C.

### Table 4. Upper Limits of Normal of Average ABP as Recommended by Ad Hoc Panel of the American Society of Hypertension (14) Based Upon Observational Data

<table>
<thead>
<tr>
<th>BP Measure</th>
<th>Probably Normal</th>
<th>Borderline</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic average (mmHg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awake</td>
<td>$&lt; 135$</td>
<td>$135–140$</td>
<td>$&gt; 140$</td>
</tr>
<tr>
<td>Asleep</td>
<td>$&lt; 120$</td>
<td>$120–125$</td>
<td>$&gt; 125$</td>
</tr>
<tr>
<td>24 h</td>
<td>$&lt; 130$</td>
<td>$130–135$</td>
<td>$&gt; 135$</td>
</tr>
<tr>
<td>Diastolic average (mmHg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awake</td>
<td>$&lt; 85$</td>
<td>$85–90$</td>
<td>$&gt; 90$</td>
</tr>
<tr>
<td>Asleep</td>
<td>$&lt; 75$</td>
<td>$75–80$</td>
<td>$&gt; 80$</td>
</tr>
<tr>
<td>24 h</td>
<td>$&gt; 80$</td>
<td>$80–85$</td>
<td>$&gt; 85$</td>
</tr>
</tbody>
</table>
normal ABP (white coat hypertension). Conclusion: Normal values for ABP have been defined based upon equivalence to office/clinic BP readings.14 One outcome study18 has identified a mean 24-h ABP = 134/78 mm Hg as being predictive of total and increased cardiovascular mortality (level 1). A second outcome study19 has defined a normal daytime ABP as < 136/87 mm Hg for men and < 131/86 mm Hg for women (level 1).

**AMBULATORY BLOOD PRESSURE AS A PREDICTOR OF TARGET ORGAN DAMAGE**

**Left Ventricular Mass Index** Echocardiographic assessment of left ventricular (LV) mass provides prognostic information beyond that given by traditional risk factors. Based upon longitudinal data from the Framingham Heart Study,20,21 increases in LV mass correlate more significantly with ABP than with office or clinic BP.22

Several studies have reported that ABP is a better predictor of clinical outcomes than the office BP. In an early study using a semiautomated Remler device, Perloff et al25 reported the log albumin excretion rate was significantly correlated with both the 24-h systolic (r = 0.134; P < .0001) and diastolic (r = 0.095; P = .005) ABP. Albumin excretion rate did not correlate with the office systolic BP (r = 0.059) but did correlate (r = 0.086; P < .01) with the office diastolic BP.

### Table 5

<table>
<thead>
<tr>
<th>BP Measure</th>
<th>Reference</th>
<th>Normal value</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 hour ABP (mmHg)</td>
<td>(18)</td>
<td>&lt;134/78</td>
</tr>
<tr>
<td>Awake ABP (mmHg)</td>
<td>(19)</td>
<td>&lt;136/87</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>&lt;134/78</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td>&lt;131/86</td>
</tr>
</tbody>
</table>

### Clinical Cardiovascular Outcomes

Several studies have reported that ABP is a better predictor of clinical outcomes than the office BP. In an early study using a semiautomated Remler device, Perloff et al25 followed 1076 patients with essential hypertension recruited from a clinic-based population over 10 years and compared the office and ambulatory BP as predictors of fatal and nonfatal cardiovascular events. The ABP was a significantly better predictor of outcome for both the diastolic and systolic BP for both fatal and first nonfatal cardiovascular events. Using a population derived from a hospital-based clinic, Verdecchia et al19 have reported a significantly higher cardiovascular morbidity in patients with persistent hypertension compared to normotensives, based upon 24-h ABP recordings. Patients with persistent hypertension on the ABP with a nocturnal fall in BP (dippers) had an event rate of 1.79 per 100 patients-years,
whereas the rate was 4.99 in patients without a nocturnal fall in BP (nondippers). The normotensive subjects derived from hospital and medical staff had a similar cardiovascular event rate (0.47 per 100 patient-years) to patients with “white coat hypertension” (0.49 per 100 patient-years). The ABP also stratified cardiovascular risk independent of the clinic BP.

Using a population-based sample, Ohkubo et al\textsuperscript{18} followed 1542 individuals undergoing an ABP recording for a mean of 5.1 years. The ABP was a better predictor of cardiovascular mortality than office BP, with subjects in the highest quintile for systolic and diastolic ABP being at greatest risk ($P < .05$) for experiencing cardiovascular death. (adjusted relative hazard for mortality for systolic BP 4.61, 95% CI 1.35–5.66; and diastolic BP 3.33, 95% CI 1.09–10.57) Conclusion: ABP is a better predictor of clinical cardiovascular outcomes than office/clinic BP\textsuperscript{18,19} (level I).

**CLINICAL IMPORTANCE OF NOCTURNAL BLOOD PRESSURE**

The majority of patients with uncomplicated essential hypertension exhibit a fall in mean nocturnal BP of $\geq 10$ below the mean awake ABP.\textsuperscript{14,29} These individuals have been termed “dippers” (compared to “nondippers,” who exhibit $< 10\%$ fall in nighttime BP. Certain subgroups tend to be nondippers, including diabetic patients, black patients, older patients, and patients with various forms of secondary hypertension.\textsuperscript{29} Several observational studies have reported an increase in cardiovascular outcomes in nondippers. Verdecchia et al\textsuperscript{19} noted a tenfold increase in cardiovascular outcomes in nondippers versus normotensives and white coat hypertensives in a longitudinal study, with female nondippers having a worse prognosis. Ohkubo et al\textsuperscript{30} have also reported a significant ($P < .02$) increase in cardiovascular mortality (adjusted relative hazard 2.56; 95% CI 1.16–5.63) over a mean 5.1 years in 1542 Japanese subjects whose nocturnal BP did not fall $\geq 10\%$ during sleep. Conclusion: Individuals who fail to show a reduction in nighttime BP of $\geq 10\%$ may be at increased risk for experiencing cardiovascular outcomes. Dipper status should be considered in the clinical interpretation of 24-h ABP recordings\textsuperscript{19,30} (level I).

**OFFICE-INDUCED INCREASES IN BLOOD PRESSURE**

Terminology The original term used to describe the condition in which the office BP exceeded the ABP was “white coat hypertension.””\textsuperscript{31} This term implies an untreated patient with an abnormally high office BP and “normal” ABP. Excluded from this definition are at least three other types of individuals: 1) untreated patients whose office BP exceeds their ABP with both values being higher than normal; 2) untreated patients whose office BP exceeds their ABP with both values being in the normal range; and 3) treated hypertensive patients with office BP higher than ABP.

Recently, the World Health Organization (WHO) proposed the term “isolated clinic hypertension” to describe those patients who have hypertension in the office but a normal ABP.\textsuperscript{32} However, this definition also excludes many patients with differences between office and ambulatory BP and is dependent on specific definitions for “hypertension” and “normal” BP, which have yet to be standardized. If one accepts isolated office hypertension to describe classical patients with white coat hypertension, then there is still a need for a term to describe all other patients having clinically important differences between office BP and ABP. “White coat effect” is one possibility; or, alternatively, “office-induced increase in BP” is another. A clinically important office-induced increase in BP could be said to be present when the office readings exceed the ambulatory by $\geq 20$ mm Hg systolic or 10 mm Hg diastolic, which represents about 2 standard deviations (SD) from the mean of a series of systolic and diastolic ambulatory BP readings.\textsuperscript{33,34}

**CHARACTERISTICS ASSOCIATED WITH THE WHITE COAT EFFECT**

A consistent finding in most series reporting on the prevalence of white coat hypertension or the white coat effect is a preponderance of female subjects having this condition.\textsuperscript{14,35,36} This observation has been noted in both untreated and treated populations of hypertensive subjects. Older patients with hypertension are also more likely to exhibit a greater difference between office and ambulatory BP.\textsuperscript{14} Patients with systolic hypertension may also be more likely to demonstrate a higher office than ambulatory BP.\textsuperscript{36} Patients with predominantly systolic hypertension based upon office readings are also more likely to demonstrate a greater office minus ambulatory BP difference.\textsuperscript{36–38}

**WHITE COAT EFFECT, LEFT VENTRICULAR MASS INDEX, AND CARDIAC FUNCTION**

Normotensive subjects and patients with office-induced increases in BP who have similar 24-h and awake ABP values generally have the same degree of target organ damage and share other clinical characteristics.\textsuperscript{39–45} When LV mass index has been reported to be greater for patients with a white coat effect versus for normotensives,\textsuperscript{9} then the mean ABP for the white coat effect group has generally also been greater than for the normotensive subjects. Glen et al\textsuperscript{41} have even reported lower LV mass index values for patients with a white coat effect compared to normotensive subjects.

Other measures of left ventricular function such as
diastolic dysfunction and indices of myocardial stiffness have been reported to be abnormal in patients with white coat hypertension or the white coat effect. However, findings in the literature are generally inconsistent, and outcome measures have sometimes been determined without blinding and without standardized methodology. The effect of office-induced increases in BP on these parameters remains uncertain.

**AMBULATORY BLOOD PRESSURE IN TREATED HYPERTENSIVE PATIENTS**

Patients receiving long-term antihypertensive therapy may also demonstrate a difference between office and ambulatory BP values. The magnitude of the difference appears to depend on several factors, including the sex of the patient (greater in female patients) and the presence of a higher office systolic BP. In some instances, the office minus ambulatory BP difference can be quite marked and could be important in the management of the individual patient. There is no generally accepted definition of an office-induced increase in BP in treated hypertensive patients. However, a difference of ±20 mm Hg systolic or 10 mm Hg diastolic represents 2 standard deviations for systolic and diastolic ambulatory readings, and also likely represents a “clinically important” difference with implications for individual patient care. The presence of much lower awake ABP values also raises the possibility that some patients with a marked difference between office and ambulatory BP may be overtreated. Assessment of the effectiveness of antihypertensive therapy using office BP readings tends to overestimate the patient’s response to drug therapy by including the “placebo” component of the reduction in BP, which is not seen with ABP.

Staessen et al performed a randomized, controlled trial comparing antihypertensive therapy based upon conventional office versus ambulatory BP in 419 patients. Drug therapy was adjusted based either upon office BP (n = 206) or ABP (n = 213) BP and patients were followed for a mean of 182 days. Both groups of patients had similar ABP and office BP and similar values for LV mass index but the group whose treatment was based upon ABP received less intensive drug therapy. The savings in drug costs were offset by the costs of the ABP recordings. Conclusion: ABP may be useful in selected patients receiving chronic antihypertensive therapy as part of their long-term management (level II).

**RECOMMENDATIONS**

Based on the above data, our recommendations are as follows:

1. Physicians should only use ambulatory BP monitoring devices that have been validated independently using established protocols (grade A).
2. A decision to withhold drug therapy based upon the ambulatory BP should take into account normal values for 24-h and awake ambulatory BP (grade B).
3. Based upon studies on prognosis (grade A) and a clinical trial based upon BP control as an outcome (grade B), ambulatory BP monitoring should be considered for untreated patients whenever an office-induced increase in BP is suspected.
4. Ambulatory BP monitoring should be considered for treated patients suspected of having an office-induced increase in BP, including individuals with apparent resistance to drug therapy, symptoms suggestive of hypotension, and fluctuating office BP readings (grade B).
5. Based upon studies on prognosis (grade A), changes in nocturnal BP should be taken into account in any decision to withhold drug therapy based upon the ABP.
6. Further studies are required to determine whether the clinical benefit of antihypertensive therapy is more closely related to ambulatory or office BP (grade D).

**OTHER RECENT NATIONAL GUIDELINES**

**American Society of Hypertension** These recommendations are consistent with those of the ASH Ad-hoc Panel. The one important difference is the exclusion of self-measurement of BP in the diagnosis of persistent hypertension. A review of studies in self measurement indicates that there are currently insufficient data available upon which to base clinical decisions using these devices.

**US Joint National Committee VI** Although JNC VI did not discuss ABP monitoring in detail, it generally agreed with the recommendations of the ASH panel with the caveat that ABP monitoring should not be used indiscriminately in the routine evaluation of patients with suspected hypertension.

**German Hypertension League Statement on Ambulatory Blood Pressure Monitoring** The German Hypertension League (GHL) recommends ABP monitoring for both the diagnosis and treatment of hypertensive patients. The GHL guidelines focus on patients most likely to exhibit isolated clinic hypertension including those without target organ damage or coexisting conditions. For treated hypertensive patients, the GHL recommends ABP in persons with apparent drug resistance, elevated nocturnal BP readings, failure of regression of target organ damage, and symptoms suggestive of hypotension (eg, dizziness). Otherwise, the GHL views on ABP are similar to the ASH
panel's and also to the recommendations proposed for the CHS.

Other Recommendations Several other national societies have published guidelines for ABP monitoring. The only recent report has come from the Italian Hypertension Society,55 but it was primarily concerned with the more technical aspects of ABP monitoring. All other recommendations have been published before 1995 did not take into account the more recent literature, especially in regard to clinical outcomes. Nonetheless, the French Society of Hypertension,56 the Brazilian Society of Cardiology,57 the American College of Cardiology,58 and the Swiss Hypertension Society59 have all recommended ABP monitoring in a variety of patient populations. Pickering60 has recently summarized these different national guidelines and has concluded that guidelines published since 1994 support the clinical use of ABP monitoring in clinical practice.

IMPLICATIONS FOR CLINICAL PRACTICE

These guidelines have been derived from the best available evidence in the scientific literature. They provide a basis for using ABP monitoring in clinical practice but are not intended to serve as a practice manual for the individual physician. A decision to perform an ABP recording in an individual patient should take into account many considerations, including the presence of coexisting medical conditions (eg, diabetes mellitus), target organ damage, gender, and age. The availability of ABP monitoring and financial considerations may also influence the decision to perform a recording.

REFERENCES

20. Levy D, Garrison RJ, Savage DD, Kannel WB, Castelli


