

Home Blood Pressure Monitoring: A Call to Action for Pharmacists

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Over the past decade, the pharmacy profession has changed dramatically. More significantly, however, is how the pharmacist within both the community and institutional settings has become a critical interdisciplinary team member.¹ Within integrated health systems, data suggest that when pharmacists are included as members of the health care team, the percentage of patients with hypertension who reach their goal blood pressure (BP) is increased.² Furthermore, drug interactions, patient nonadherence, and overall direct and indirect costs associated with hypertension are also reduced.³

Per the recommendations of the new Healthy People 2010, goals for hypertension warrant a more intensive approach in order to achieve desired BP control rates.⁴ Achieving these goals in the hypertensive population, however, will be difficult without significant assistance by pharmacists.⁵ One way pharmacists can begin impacting the public health problem of hypertension is by becoming educated advocates for home blood pressure monitoring (HBPM).

Emphasis on Home Blood Pressure Monitoring

Many criticisms exist regarding office-based BP measurements, which include observer variability and training, terminal digit bias, and white-coat hypertension.⁶ When making therapeutic decisions, these factors present a dilemma for providers. The Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) recommend HBPM.⁷

The JNC 7 report indicated that HBPM can target the following issues surrounding the pharmacotherapy of hypertension: increase therapy compliance, evaluate the accuracy of diagnosis, validate drug regimen efficacy, reduce treatment costs, and educate patients. Furthermore, HBPM appears ideal to overcome difficulties in interpreting office BP readings. Unfortunately, HBPM is often not routinely used. In fact, patients receive little education from their primary care providers regarding HBPM.⁸⁻¹²

Value for the Patient

Home BP monitors are relatively affordable, especially considering the value of the information they deliver. These devices can provide a visual cue and a positive reinforcement tool for drug adherence, for example. By recording and documenting fluctuations in BP, a home monitor can assist in determining an appropriate drug-dose interval, as well as evaluate the efficacy of therapeutic modifications. This information in turn reinforces to the patient the advantages of good BP control and an overall understanding of the disease itself. Increased awareness may provide better compliance



while potentially decreasing the incidence of the deadly, long-term consequences of uncontrolled hypertension.¹²⁻¹⁴

Pharmacists' Role

Community pharmacists are uniquely positioned to overcome the barriers associated with office-based BP measurement. Home BP monitors are typically sold in community pharmacies. Moreover, patients visit their pharmacy almost monthly to pick up their antihypertensive medication, more frequently than any other health care facility.¹⁵ Furthermore, collaborative relationships are being developed between physicians and community pharmacists to improve hypertension management.¹⁶ The Hypertension Outcomes Through Blood Pressure Monitoring and Evaluation by Pharmacists (HOME) study found that patients who received education regarding their hypertension, as well as instruction regarding use of a home BP monitor from a community pharmacist had a statistically significant lower diastolic BP, compared with those patients who received their BP evaluation solely from their primary care provider.¹⁷

Types of Home Blood Pressure Monitors

The 3 major configurations of BP monitors available for home use include aneroid manometers, semiautomatic digital monitors, and fully automatic digital devices.¹⁸

The gold standard method for measuring BP is the mercury sphygmomanometer, which measures BP with a plastic or glass tubular gauge, a mercury reservoir, and a manually inflated cuff. In order to measure BP this device uses gravity. Thus its readings are considered the most clinically consistent and accurate.¹⁹

The aneroid monitor employs a mechanical bellows and lever sys-

tem that requires frequent calibration to create reliable and accurate readings. The aneroid monitors are the least expensive option for patients, yet they are considered less accurate, compared with mercury sphygmomanometers.

Unlike the aneroid device, the digital monitors come with either a semiautomatic or completely automatic inflatable cuff. These monitors almost entirely use oscillometric measurement in order to determine BP. Small oscillations or changes in cuff inflation obtain the mean systolic and diastolic pressure. These readings are calculated by using a set of percentages that vary depending on the model's manufacturer. The peak amplitude of the oscillations is the mean BP. Systolic pressure is a reference point about 55% prior to this peak, and diastolic pressure is approximately at a point 85% after the peak.^{10,12,14,20}

Comparisons of Monitors

While the mercury sphygmomanometer and aneroid manometer may be less expensive, they do not lend themselves to home use. For both types of devices, the majority of patients do not possess the skills and dexterity required to use them, as a stethoscope, must be used to auscultate the Korotkoff sounds. Furthermore, for the mercury sphygmomanometer, mercury presents a potential health hazard if spilled or if it comes in direct contact with skin.

The digital monitor appears to have all the characteristics that make it an ideal choice for HBPM. The BP reading is displayed on an easily readable digital screen designed with large formats for older adults with poor eyesight. Most monitors will routinely record and store BP and heartbeat readings, with some having the additional capability of downloading the data


to a PC for tracking, printing, and even e-mailing to a health care provider. Studies have shown that these devices demonstrate a high degree of correlation with auscultation readings obtained by a practitioner or by oscillometric devices.¹²


These devices range in cost from about \$40 for a semiautomatic unit to around \$99 for a fully featured automatic monitor. It is important that the home BP monitor pharmacists recommend is appropriately validated as evidenced by published clinical studies in peer reviewed journals. A list of validated monitors is available at www.bhsoc.org/blood_pressure_list.stm.¹⁴

The FDA-Approved Monitor

The first BP devices cleared by the FDA to detect morning hypertension are manufactured by Omron Healthcare. One such device is the Omron HEM-780 with IntelliSense technology. This device is an automated, upper-arm, oscillometric device that measures BP and detects irregular heartbeats. Its memory will automatically store BP and pulse-rate information for 2 individuals for up to 84 sets of measurement values in addition to weekly morning and evening BP averages per individual for 8 weeks.

More Information

The Subcommittee on Professional and Public Education of the American Heart Association Council on High Blood Pressure Research has published guidelines specifically addressing the measurement of BP.¹⁴ These guidelines can be found at www.americanheart.org/presenter.jhtml?identifier=3004579. For more information on morning hypertension, visit www.morningbp.com/pt29 

 For a list of references, go to: www.PharmacyTimes.com.

This handout for pharmacists will be available online at www.PharmacyTimes.com.