

**Final Report**  
**Pharmacy Based Activity to Reverse and Manage Disease (PHARMD):**  
**The Hypertension Project, Nova Southeastern University**  
**June 18, 2004**

## **Introduction**

Cardiovascular disease is a substantial public health problem in the U.S. population, particularly among minorities in the southeastern region.<sup>1,2</sup> The prevalence of hypertension is 24% among all adults, but is much higher in African-Americans (32%).<sup>3</sup> Hypertension is also higher in Caucasian men (25%) as compared to women of the same race (21%). In the U.S., only 59% of Americans with hypertension are currently being treated, and of those, only 34% have an optimal blood pressure.<sup>2</sup> Treatment of *men* under the age of 50 is substantially lower than average among African-Americans (34%), Mexican-Americans (17%) and Non-Hispanic Whites (33%).<sup>3</sup> To address these issues and others, the goals of the PHARMD Hypertension Project were to:

1. Provide greater access to accurate hypertension screening, referral, and follow-up to minority populations, specifically African-Americans.
2. Produce individualized cardiac risk assessments based on personal and family history.
3. Educate pharmacy consumers on the warning signs of heart attack and stroke.
4. Determine whether or not an effective screening program could be maintained in a busy community pharmacy.

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<sup>1</sup> Hall WD, Ferrario CM, Moore MA et al. Hypertension-related morbidity and mortality in the southeastern United States. *Am J Med Sci* 1997;313:195-206

<sup>2</sup> The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension* 2003;42:1206-1252

<sup>3</sup> Burt VL, Whelton P, Roccella EJ et al. Prevalence of Hypertension in the US Adult Population: Results From the Third National Health and Nutrition Examination Survey, 1988-1991. *Hypertension* 1995 25(3):305-313

## **Approach**

Screening operations were conducted in two Walgreen's pharmacies with large minority populations around the city of West Palm Beach, FL from August 2003 to April 2004. These pharmacies provided cardiac-related screening and counseling services, at no charge, at all times the pharmacy was open including nights, weekends, and holidays. Screening services included blood pressure measurement, weight and height measurement (BMI), and cardiac risk surveying. Monitoring of blood pressure and BMI was available for those with diagnosed hypertension. Adults were recruited for screening via an in-store promotional campaign including, bag stuffers, register flyers, and signs. Additionally, adult patients currently prescribed anti-hypertensive medication were invited to participate by the pharmacy staff. Informed consent was obtained.

Pharmacy staff (both technicians and pharmacists) from both stores completed training on screening methods, using both electronic and manual blood pressure measurement devices. Additionally, pharmacy students taking an elective course were assigned to each of the stores on a weekly basis to conduct blood pressure screening. All patients with a high blood pressure reading received a recommendation to see their physicians or got a referral to a physician if they had no regular doctor. Patients without insurance were given appointments at a free health clinic in the area. Patients with high blood pressure were also advised to return to the pharmacy for further screening (cholesterol and glucose) and all received educational material on ways to lower their blood pressure and the warning signs of a heart attack.

## **Results**

### Screening Effectiveness

There were a total of **569** people screened for high blood pressure from August 2003 through March 2004 at the two pharmacies. The total number of encounters during the same period was 735, which includes people with multiple blood pressure measurements. The original goal was to have 2,500 encounters in this time period. This goal was not met for a variety of reasons. However, access was improved in a measurable way as the program reached 1.5% of the adults in the zip codes surrounding the pharmacies involved (note: approximately 40,000 adults were eligible). Also, the program was successful in screening people in high-risk groups for cardiovascular disease including African-Americans (50% of those screened) and males (48% of those screened).

### **Characteristics of the Screened Population**

#### Blood Pressure Level and Treatment Rate

The rate of high blood pressure among this population was as expected with 30% of the total population having at least one actual **measurement** at the Stage I hypertension level (140 mmHg or higher systolic or 90 mmHg or higher diastolic blood pressure). In a predominantly African-American population, the expected prevalence of high blood pressure would be approximately 30%. The average blood pressure for persons with at least one high measurement was 151 mmHg SBP and 98 mmHg DBP. This included people currently receiving medication to treat high blood pressure. Lack of BP control places many in this population at substantial risk for a cardiovascular event. For perspective, every increase of 20 mmHg SBP over the optimal of 115mmHg or 10 mmHg DBP over 75 mmHg doubles the patient's risk of a cardiovascular event.<sup>2</sup> The

distribution of blood pressure in the population is shown in Table 1 below. The term pre-hypertension is new and designates a group at high risk for developing hypertension in the future.

**Table One: Blood Pressure Distribution (N=388\*)**

Stage	SBP mmHg	Patients	DBP mmHg	Patients
Optimal	<120	174	<80	288
Pre-hypertension	120-139	224	80-89	165
One	140-159	117	90-99	76
Two	160-179	37	100-109	31
Three	≥ 180	17	≥ 110	9

\* first measurement only

About 40% of patients reported having a diagnosis of hypertension. Of these patients, just over 69% reported receiving medication for it, which is a higher than the expected rate (54%). Of those self-reporting hypertension and receipt of medication, the average systolic blood pressure was still high at 141 mmHg and the average diastolic blood pressure was 85 mmHg. Of those patients self-reporting hypertension currently not taking medication, average blood pressure was in the pre-hypertensive state at 133 mmHg systolic and 86 mmHg diastolic. There were 52 or 9% of patients reporting that they did not have a diagnosis of hypertension who did have a first measurement exceeding 140 mmHg or 90 mmHg. The average blood pressure reading for this group was 152/96 mmHg

#### Cardiovascular Disease Risk Factors

The rate of smoking among the screened population was lower than average, most likely due to the older age of the participants. The rate of diabetes was higher than expected, possibly again due to age and higher body mass index (BMI). The average

participant was overweight with a BMI of 29. More than half of the patients who were screened are considered to be obese. Blood pressure was in the pre-hypertensive state, on average, for all patients with self-reported risk factors for cardiovascular disease. Neither kidney disease nor diabetic patients were meeting a goal pressure of less than 130/80. For comparison, persons screened who did not report any risk factors had an average blood pressure of 127/79 mmHg.

**Table Two: Self-Reported Risk Factors for Cardiovascular Disease**

Risk Factor (Total Responses)	Number Responding	Percentage	Average SBP	Average DBP
Current Smoker	547	21%	129	81
Diabetic	557	15%	138	82
Has Kidney Disease	554	7%	138	83
Has High Cholesterol	531	22%	139	83
No Physical Activity	551	39%	130	80
BMI (Obese, 30 or higher)	171	62%	135	85
Previous heart attack/angina	521	14%	135	83
None of the above risks	569	17%	127	79

Cholesterol and Glucose Screening

Most patients did not want to have their cholesterol or glucose screened.

Recruitment was low because an 8 hour fast was required prior to testing and many people were unable to come to the pharmacy early in the morning. A total of 39 patients had their fasting total cholesterol measured. The average level of total cholesterol in this group was 179, with a range of 54 to 236. Total levels over 200 are considered too high. Of the eight patients with a total cholesterol of 200 or more, five indicated a prior diagnosis of hypercholesterolemia. A total of 37 patients had their fasting glucose measured. The average level of fasting glucose in this group was 95 with a range of 53 to

204. Fasting glucose levels over 126 are considered too high. Of the four patients with levels over 126, two did not report having a prior diagnosis of diabetes.

#### Operational Assessment

The project was planned for two stores, however, due to construction delays operations in one of the stores didn't start until late September 2003. The space required was minimal including room for a weight scale, small table and two chairs. Privacy was maintained by locating the equipment in the corner of a small room next to the pharmacy itself. The equipment could be operated with either batteries or an electrical plug. We experienced no equipment failures and validation of the accuracy of the electronic cuffs was obtained with direct comparison using a manual cuff.

Staff training was completed quickly and there was good attendance by store personnel. Initial participation in the program was good from everyone, especially from the pharmacists. However, over time the enthusiasm wore off, especially among those pharmacists who did not normally work (dispense) at the store where the screening was conducted. The pharmacists were not paid for the extra time and after a few weeks of participation, many dropped out of the program. Part of the loss of enthusiasm may also have occurred because the demand for cholesterol and glucose screening was minimal at the beginning of the study. Additionally, staff turnover at one store was 100% among both the pharmacists and technicians. Store personnel were happy to accommodate screening whenever the pharmacy wasn't busy; however, none of the managers would agree to dedication of a technician to screening (i.e., excusing them from dispensing duties). Staff participants expressed satisfaction with the training they received and the

operation of the program. They said that patients appreciated the service and they felt gratified in giving it to them.

## **Conclusions**

To be cost-effective (aiming for a cost per screening of under \$5 per person), the screening throughput needs to be higher. This requires a more aggressive marketing campaign. This also requires that there be a champion for the program that actually works in the store (can't be imposed from outside). Loss of store champions due to turnover had a negative impact on the screening rate. Additionally, dedicated staff is essential so that personal relationships can be established and maintained. Use of pharmacy students is helpful with initial throughput but long term monitoring would work best with dedicated personnel. There was success in increasing access to blood pressure screening to high risk groups and the program was well received by patrons in both stores. The main clinical observation is that treatment needs to be more aggressive particularly in those with multiple risk cardiovascular disease factors. Many of the patients seen with Stage 2 or higher blood pressure were being treated with a single agent and would have benefited from combination drug therapy. Finally, the large number of people in the pre-hypertensive state indicates that the problem of high blood pressure and resultant heart disease and stroke will be much higher in the future.

## **Future Goals**

A manuscript based on this research is in preparation and is expected to be submitted in October 2004. The manuscript will include analysis of the patient knowledge surveys as well as the information presented above.