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.\textsuperscript{1,2} The prevalence of hypertension is 24% among all adults, but is much higher in African-Americans (32%).\textsuperscript{3} 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.\textsuperscript{2} 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%).\textsuperscript{3} 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.


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 115 mmHg or 10 mmHg DBP over 75 mmHg doubles the patient’s risk of a cardiovascular event.² 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>
<thead>
<tr>
<th>Table One: Blood Pressure Distribution (N=388*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Optimal</td>
</tr>
<tr>
<td>Pre-hypertension</td>
</tr>
<tr>
<td>One</td>
</tr>
<tr>
<td>Two</td>
</tr>
<tr>
<td>Three</td>
</tr>
</tbody>
</table>

* 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 that 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>
<thead>
<tr>
<th>Table Two: Self-Reported Risk Factors for Cardiovascular Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Factor (Total Responses)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Number Responding</td>
</tr>
<tr>
<td>Current Smoker</td>
</tr>
<tr>
<td>Diabetic</td>
</tr>
<tr>
<td>Has Kidney Disease</td>
</tr>
<tr>
<td>Has High Cholesterol</td>
</tr>
<tr>
<td>No Physical Activity</td>
</tr>
<tr>
<td>BMI (Obese, 30 or higher)</td>
</tr>
<tr>
<td>Previous heart attack/angina</td>
</tr>
<tr>
<td>None of the above risks</td>
</tr>
</tbody>
</table>

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.