

9-1976

A screening, referral, and follow-up program for high blood pressure at Henry Ford Hospital: Part II. Results of referral and follow-up

John C. Erfurt

Andrea Foote

John R. Caldwell

Follow this and additional works at: <https://scholarlycommons.henryford.com/hfhmedjournal>



Part of the [Life Sciences Commons](#), [Medical Specialties Commons](#), and the [Public Health Commons](#)

Recommended Citation

Erfurt, John C.; Foote, Andrea; and Caldwell, John R. (1976) "A screening, referral, and follow-up program for high blood pressure at Henry Ford Hospital: Part II. Results of referral and follow-up," *Henry Ford Hospital Medical Journal* : Vol. 24 : No. 3 , 131-146.
Available at: <https://scholarlycommons.henryford.com/hfhmedjournal/vol24/iss3/3>

This Article is brought to you for free and open access by Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Henry Ford Hospital Medical Journal by an authorized editor of Henry Ford Health System Scholarly Commons.

A screening, referral, and follow-up program for high blood pressure at Henry Ford Hospital: Part II. Results of referral and follow-up

John C Erfurt, BA,* Andrea Foote, PhD,**
and John R. Caldwell, MD***

This is the second of two articles on the Henry Ford Hospital screening, referral, and follow-up program for high blood pressure. The first reported on the screening results of the program, along with associated epidemiological findings. This article presents the results of referral and follow-up. During the period of March 27 through December 11, 1975, 808 people were screened; 196 (24%) were found to have uncontrolled high blood pressure and were referred to physicians for diagnosis and possible treatment for hypertension. The program is currently following up with these people and their physicians to insure successful referral and maintenance of treatment. This paper outlines the overall procedures used for screening, referral, and long-range follow-up. It also presents an evaluation of these procedures, along with outcome data after an average duration of ten months of follow-up. As of June, 1976, the success rates recorded by the program include the following: (a) of all people referred for high blood pressure, 86% were successfully referred (had visited a physician for this condition); (b) of the group successfully referred, 90% had entered (or re-entered) treatment for hypertension; and (c) of those under treatment, 67% were showing successful treatment (blood pressure below 140/90) or progressing toward successful treatment (blood pressure below the screening levels of 160/96).

* Associate Research Scientist and Co-Director, Worker Health Program, Institute of Labor and Industrial Relations, The University of Michigan.

** Assistant Research Scientist and Co-Director, Worker Health Program, Institute of Labor and Industrial Relations, The University of Michigan.

*** Chief, Section on Hypertension, Henry Ford Hospital.

This is the second of two articles on this program. The first article presented an epidemiological analysis of the screening results.

Address reprint requests to Dr. Caldwell at Henry Ford Hospital, 2799 West Grand Boulevard, Detroit MI 48202

HYPERTENSION is one of the most serious diseases in the United States today. It affects fifteen percent or more of all adults, and it is strongly related to cardiovascular diseases.^{1, 2} The data in Figure 1, from 26 life insurance companies, indicate large increases in the risk of mortality with relatively small increments in blood pressure, both systolic and diastolic.³

Many medications are now available for treating hypertension, and the effectiveness of such treatment for reducing the incidence of cardiovascular events has been demonstrated by the Veterans Administration studies.^{4, 5}

Yet despite the availability and efficacy of treatment, it has become clear that many patients drop out of treatment, and a great many other people with elevated blood pressure are not being diagnosed. A 1968-69 survey of Detroit area residents (25-60 years of age), conducted by The University of Michigan's Program for Urban Health Research, estimated that there are 240,000 adults with high blood pressure in the city of Detroit.⁶ Data from this study indicated that only 9% of the residents with high blood pressure were under adequate treatment for it (with BP readings below 140/90 mm Hg). Furthermore, over half (51%) of the people with high blood pressure were not even aware of having it. The remaining proportion of people with high blood pressure (40%) had been diagnosed as having this disease, but were either under no treatment for it at the time, or under inadequate treatment. These latter data indicate that large numbers of diagnosed hypertensives had either dropped out of treatment altogether, or were not effectively following their treatment regimens.

The results of this survey are very similar to those of many other studies conducted throughout the country. The evidence is overwhelming in supporting the following conclusions: (a) large numbers of people with high blood pressure have never been

diagnosed as having hypertension, and thus are not aware of their condition; (b) awareness alone is not enough, in that merely informing people that they have high blood pressure does not insure that they will actually visit a physician for diagnosis and prescribed treatment; and (c) successful referral and diagnosis is still not enough, in that making certain that people with high blood pressure actually visit a physician for diagnosis and prescribed treatment does not insure their long-term maintenance of treatment.

These barriers to effective hypertension control result from the asymptomatic nature of the disease. Because of this, the adequate control of hypertension will require additional health service delivery procedures to identify the masses of people with high blood pressure, and insure that they begin and maintain appropriate treatment. In the absence of such procedures, we must expect that hypertension will remain as poorly controlled as it is now, and that death rates due to related cardiovascular diseases will not be significantly reduced.

In response to this problem, Henry Ford Hospital began a program in March, 1975, to screen people for high blood pressure, refer those with high readings to sources of medical care, and follow up with these people and their physicians to insure successful referral and maintenance of treatment. The program was begun in cooperation with the Hypertension Coordinating and Planning Council of Southeastern Michigan, also known as BLOOD PRESSURE CONTROL, and was based on the premise that *follow-up*, rather than screening, would be the most significant factor in improving hypertension control among hospital visitors.

This paper describes the program's procedures, and reports on the results of the referral and follow-up activities. A previous paper, published in this journal, presented the screening results of the program, along with associated epidemiological findings.⁷

Screening, referral, and follow-up program for high blood pressure

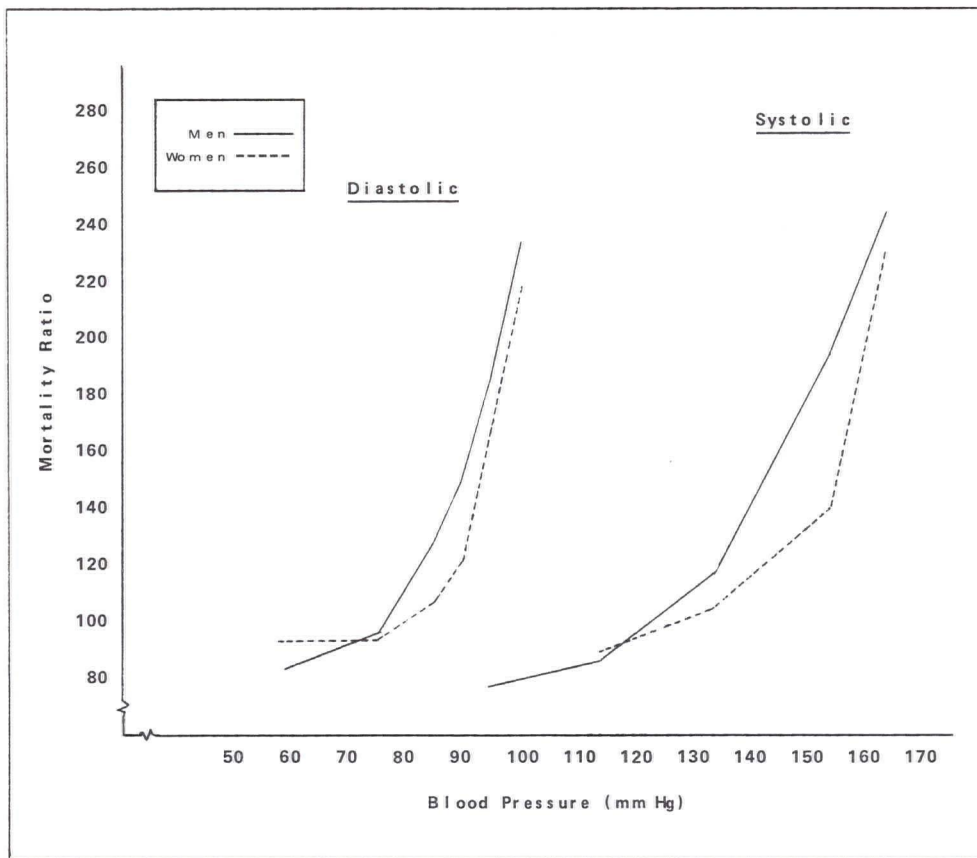


Figure 1

Mortality by blood pressure levels. Mortality ratio is the ratio of actual to expected mortality (mortality ratio among standard risks=100). Data are based on a study of 26 large life insurance companies, covering some four million policies issued to men and women from 1935 to 1953.³ Data presented by permission.

Screening and referral procedures

The blood pressure screening and referral procedures are carried out in the Henry Ford Hospital lobby, and the service is offered to anyone coming through the lobby (eg, Hospital employees, outpatients, visitors). Screening and referral are carried out by volunteer nurses recruited by the Hospital, using the forms and procedures developed by The University of Michigan's Worker

Health Program.⁸ These procedures are summarized in Table 1. Initial screening requires an average of ten minutes per person screened (client). This includes the time to: (a) gather pertinent demographic and health information about the client, (b) take three blood pressure readings, (c) explain the readings to the client and answer his/her questions, and (d) carry out the necessary referral procedures for those clients with high readings.

Table I
OVERVIEW OF SCREENING AND REFERRAL PROCEDURES

Phase of BP screening	Clients involved in each phase	Classification of client's BP readings*	Action taken as a result of client's BP classification	
Initial screening/ referral procedures	For all clients in the target population (3 BP readings taken during screening interview)	Normal BP readings --138/88 or lower	Client is informed of his/her BP readings and told what they mean	
		Borderline BP readings --140/90 to 158/94	Client is asked to return in a few days for secondary BP screening**	
		High BP readings --160/96 or higher	Client is referred to the physician of his/her choice for further evaluation**	
Secondary screening/ referral procedures	For each client who was borderline at initial screening (3 BP readings are taken) and:	On treatment for HBP, or age 40 or younger →	Low risk-level BP --148/88 or lower	Client is informed of his/her BP readings and told what they mean
			High risk-level BP --150/90 or higher	Client is referred to the physician of his/her choice for further evaluation**
		Older than age 40, and not on treatment for HBP →	Low risk-level BP --158/94 or lower	Client is informed of his/her BP readings and told what they mean
			High risk-level BP --160/96 or higher	Client is referred to the physician of his/her choice for further evaluation**

* Two out of three readings determine the overall BP classification, ie, if at least two of the three readings are normal, the client is classified as having normal blood pressure, and so on.

** The client is always informed of his/her BP readings and told what they mean.

Screening, referral, and follow-up program for high blood pressure

The system does not require secondary screening of people whose initial readings are high (ie, who have at least two out of three readings in the high range—a systolic of 160 mm Hg or higher, and/or a diastolic of 96 or higher). Evidence from demonstration projects carried out in other community sites indicates that an immediate referral to a physician can be made for these people with relatively small chance of referring a false positive.⁹ Clients are referred to their personal physician, or to a doctor of their choice from a list of cooperating physicians.

Clients with initial readings in the borderline range are requested to return for a secondary screen, at which time three blood pressure readings are again taken. During secondary screening, clients who are already receiving treatment for hypertension, or are 40 years of age or younger, are referred to their physicians if two of the three readings are 150/90 or higher. For clients who are older than age 40, and not being treated for hypertension, a referral is made if two of the three readings are 160/96 or higher.

All clients who are referred to physicians for elevated blood pressure (either at initial or secondary screening) are asked to sign a medical authorization form which allows the program to (a) release information concerning the client's blood pressure and health history to his/her attending physician, and (b) gather information from the attending physician regarding the client's condition, including blood pressure readings, diagnosis, prescribed treatment, and subsequently any further developments.

Results of screening and referral

The following figures regarding the results of screening and referral activities cover the period March 27 through December 11, 1975. During that period, 808 people were screened and the results of initial screening

were as follows:

- 365 people (45%) were found to have normal blood pressure.
- 128 (16%) had borderline blood pressure, and were asked to return for a secondary screen.
- 315 (39%) were found to have high blood pressure; these include:
 - 144 people with normal or borderline blood pressure readings who had been previously diagnosed as hypertensive and were under treatment; those with borderline readings were asked to return for secondary screening.
 - 171 people with observed high blood pressure readings, who were immediately referred to physicians for further evaluation.

During this same period, 81 people who had initial borderline blood pressure readings returned for secondary screening. Of those returning, 25 people were found to have elevated readings, and were referred to physicians for further evaluation.

Thus, of the 808 people screened by the program during this period, a total of 196 (24%) was referred to physicians for *uncontrolled* high blood pressure. Of these 196 referrals:

- 110 people (56%) were not under any kind of treatment for high blood pressure, representing a potential of 110 *new* hypertensive patients.
- 100 of the 196 people (51%) were referred to physicians at Henry Ford Hospital. Of these people, 47 were potential *new* hypertensive patients and 53 were referred back into treatment for hypertension.

The program is currently following up with these 196 people (clients) and their

physicians to insure successful referral and maintenance of treatment for those people placed on antihypertensive therapy. The remainder of this paper will describe the follow-up procedures and their results.

Follow-up rationale

This component of the program is aimed at *long-term* follow-up of referred clients, in cooperation with their physicians, that is, for as long as the client is hypertensive and in the target population. The operational objective of follow-up is twofold: (1) to gain information about the client's treatment status, and (2) to provide the client with the necessary support, information, encouragement, or assistance in order to insure successful referral and maintenance of antihypertensive treatment.

The evidence for a long-term follow-up commitment on the part of the program is persuasive. The classic study in Baldwin County, Georgia, demonstrated both (a) the efficacy of follow-up, in that the adequacy of control in the hypertensive population rose to 80% during the program, and (b) the futility of short-term follow-up, in that two years after the follow-up was discontinued, the adequacy of control had dropped to 29%.¹⁰

However, it appears that early follow-up (during the first year or two) is the most difficult, the most important, and the most time-consuming. An earlier study found indication that the longer a person has been aware of being hypertensive, the more likely he/she is to be under treatment.¹¹ This was attributed to the gradual process of adapting behavior to the situation, especially as a learned response to negative outcomes (eg, hypertensive emergencies resulting from uncontrolled high blood pressure).

In addition, however, it is hypothesized that early, intensive follow-up may help people establish proper therapy as a part of

their routine daily behavior, reducing the amount of follow-up required in later years. This hypothesis has not yet been tested, due to the fact that demonstration programs using long-range follow-up procedures have been in existence for less than two years.

It seems clear that the twofold objective of follow-up (gaining information and providing assistance) is necessary for an effective program. Caldwell et al found a 74% dropout rate from a hypertension clinic after a five-year period.¹¹ When patients with a hypertensive emergency who had once been on antihypertensive therapy were asked why they had dropped out, the majority of responses reflected insufficient information about the disease and its treatment. Only 7% indicated problems with side effects of drugs, and about one-third mentioned financial problems.

It seems apparent that information about the consequences of hypertension must be reiterated and reinforced a number of times. Patients seldom "hear" everything their physician tells them, and tend to be reluctant to query the doctor about points they do not understand. An effective follow-up program therefore must be prepared to clarify, interpret, and reinforce any instructions given by the physician. In many programs, follow-up personnel are better able to handle this task than is the physician; the client is often more at ease with nurses or paraprofessionals. And in the case of prescribed antihypertensive diets, dietitians or specially trained nurses are often better trained to help inform patients in how to follow the diets.

The program follows up with both clients and their attending physicians; the experience of successful programs demonstrates the necessity for doing this. As noted above, follow-up has two objectives, gaining information and providing assistance. Especially at the beginning, the best information is available only from physicians. Clients seldom know what their blood pressure was at the physician's office, and often do not know the diagnosis or even the prescribed therapy.

Screening, referral, and follow-up program for high blood pressure

If the program is to help the client, it must get the correct information from the physician. As the length of follow-up progresses, clients often become better able to provide the necessary information to the program.

Follow-up procedures

Up until June 30, 1976, the follow-up component of the program was carried out by the staff of the Hypertension Coordinating and Planning Council of Southeastern Michigan, using the forms and procedures developed by The University of Michigan's Worker Health Program.⁸ Follow-up procedures are now being carried out by the Henry Ford Hospital program staff.

The procedures used to follow up with referred clients and their physicians rely primarily on mail and telephone contacts. Table II presents a summary of the procedures used, along with the cumulative response rates for both clients and physicians. The initial wave of follow-up requires a letter and follow-up form mailed to the client about two weeks after referral. The letter reiterates the information given to the client by the nurse at screening, and serves as a reminder to make an appointment with the physician, in case the client has forgotten.

After a visit to the physician, the client is asked to fill out the follow-up form and mail it back to the program. This one-page form calls for the following information: (a) the date of the client's visit to the physician, (b) blood pressure readings during the visit, (c) the physician's evaluation, including any prescribed treatment for hypertension, (d) the extent to which the client is following this treatment, and (e) the date of the client's next appointment with the physician. About one-third (34%) of the clients in the follow-up caseload mailed back their completed follow-up forms without any additional inducement by the program.

Approximately four weeks after referral, a cover letter, follow-up form, and medical authorization form signed by the client are mailed to the client's physician. The cover letter explains the nature of the program, indicates the date(s) the client was screened, and shows what the client's blood pressure readings were during screening. The physician is asked to complete the follow-up form and mail it back to the program. This one-page form asks for the following information: (a) whether or not the client is currently a hypertensive patient, (b) the date(s) the physician has seen the client since referral, (c) the client's blood pressure readings on visit date(s), (d) the physician's diagnosis of the client's condition, (e) any prescribed treatment for hypertension, and (f) the date of the client's next appointment with the physician. About one-half (51%) of these physicians returned their completed follow-up forms without any additional inducement.

As noted previously, over half of the clients in the follow-up caseload were referred to physicians at Henry Ford Hospital. This is not surprising since many of these clients were screened during visits to the Hospital's various outpatient clinics. Thus, the program coordinator is often able to retrieve the required information from the Hospital's medical records. This type of information retrieval is included in the initial response rate among physicians, shown in Table II.

In the second step of follow-up, telephone calls are instituted for all clients and physicians who did not return the follow-up form, as well as for clients who have not yet seen the physician or who for some other reason need to be contacted. A telephone follow-up protocol is used in making these phone calls, which asks for the same basic information as that requested on the follow-up forms. As noted above, these phone calls have the purpose not only of gathering information but also of inducing the client to see the physician as required, and to follow the prescribed therapy.

Table II

PROCEDURAL STEPS FOR FOLLOW-UP OF CLIENTS REFERRED TO PHYSICIANS FOR HIGH BLOOD PRESSURE

	<u>Step #1</u>	<u>Step #2</u>	<u>Step #3</u>	<u>Step #4</u>
	Initial mailing of follow-up forms	Initial follow-up telephone calls	Mailing of duplicate follow-up forms to physicians	Subsequent follow-up contacts (by mail and/or phone)
Target of follow-up procedure	To all referred clients and their attending physicians (2 and 4 weeks after date of referral, respectively)	To those clients and physicians who fail to return follow-up forms*	To those physicians who prefer not giving information over the telephone	To all clients placed on treatment for HBP and their physicians (about 6 months after successful referral)
Cumulative response rate among clients	34%	90%	---	98%
Cumulative response rate among physicians	51%	73%	96%	97%

* Phone calls are also made to clients when it is indicated that they have not yet seen their physicians a month or so after the date of referral.

Screening, referral, and follow-up program for high blood pressure

Also, from time to time, there are some referred clients who return to the screening site to have their blood pressure taken by the program nurses. These face-to-face visits are treated as follow-up contacts, and three blood pressure readings are taken during the course of each of these contacts.

Nearly all of the clients contacted by phone are cooperative and willing to supply the program with follow-up information. Thus, with the combination of successful mail and phone contacts, the cumulative response rate among clients was 90% during the initial wave of follow-up. Only a very few clients (4%) refused to participate in the program, and there were a few (6%) who could not be reached by mail or telephone.

About half of the physicians contacted by telephone were willing to give out follow-up information over the phone. This brought the cumulative response rate for physicians up to 73% at step two. The other half of the physicians contacted in this way either (a) agreed to return the follow-up forms that they had received, or (b) informed the program that they did not receive the initial forms and requested that duplicate forms be sent in the mail. In some cases, physicians will request that the program provide special services, such as helping them work with their hypertensive patients on problems of compliance with return appointments or in following prescribed treatment.

Step three of the follow-up procedures involves the mailing of duplicate follow-up forms to those physicians making such requests. The response rate from these duplicate mailings was very good, bringing the cumulative response rate among physicians to 96%. Only 1% of the physicians have outrightly refused to participate in the program, and 3% have failed to respond to repeated mailings.

Step four in Table II, "Subsequent follow-up contacts," indicates the second wave of follow-up contacts, carried out with clients

and physicians about six months after successful referral. As stated above, the program is committed to *long-term* follow-up, and thus these subsequent contacts should be repeated every six months for each diagnosed hypertensive in the follow-up caseload. The response rates for these subsequent contacts were very high for both clients (98%) and physicians (97%). Thus, in terms of being able to contact clients and physicians, Table II demonstrates that almost all are cooperative with the aims of the program, and will provide information through the mails or over the telephone. As with other demonstration programs using the same techniques, there have been no serious difficulties in carrying out follow-up in this manner.⁹

Results of follow-up

The data regarding the results of the program's follow-up activities are again for those clients referred during the period March 27 through December 11, 1975. These results are based on follow-up with these clients through June, 1976, with the average duration of follow-up being about ten months. Of the original 196 clients referred by the program, 13 were dropped from the follow-up caseload for various reasons,* leaving a total of 183 clients included in the data presented in Table III.

The table shows a summary of the overall effectiveness of the program's procedures as of June, 1976. Of the total group of referred clients, 86% were successfully referred (had seen a physician for high blood pressure); of the group successfully referred 90% had

* Of these 13 clients, 4 had moved out of the southeastern Michigan area, 1 was already in the follow-up caseload of another blood pressure control program, 4 had died (2 from heart attacks), and 4 were suffering from advanced stages of cancer.

been placed on treatment for hypertension (or had re-entered treatment); and of those placed on treatment, 67% were under successful treatment (blood pressure below 140/90) or were progressing toward successful treatment (blood pressure had dropped significantly below screening levels). Each of these figures should become somewhat higher with continued follow-up activities.

Table III
OVERALL EFFECTIVENESS OF BLOOD PRESSURE CONTROL PROCEDURES, AS OF JUNE 1976

<i>Number of clients referred to physicians for high BP</i>	183
Percent of referred clients who saw a physician for high BP	86%
Percent of successful referrals who began treatment for hypertension	90%
Percent of clients under treatment showing success or progress toward success*	67%

* Blood pressure readings below 140/90 or significantly reduced since previous readings.

The above data are shown in more detail in Tables IV and V. Table IV shows data pertaining to the effectiveness of screening and referral. It can be seen that 5% of the people referred either refused to participate in the program or could not be contacted by program staff. For these clients, follow-up with their physicians was equally impossible because their attending physicians (if they had any) could not be identified. Nine percent of the referred clients were unsuccessfully referred, ie, had not seen their physician as of June, 1976. The 86% successful referral rate for an average ten months of follow-up is similar to those of other demonstration programs using the same methods; success rates in these other programs have ranged from 82% to 93%.⁹

Table IV
EFFECTIVENESS OF SCREENING AND REFERRAL

Referral status of all clients, as of June 1976:	<i>Number</i>	<i>Percent</i>
Refusal to participate or unable to contact	9	5%
Unsuccessful referral*	16	9
Successful referral	158	86
	<hr/> 183	<hr/> 100%
Status of successfully referred clients, as of June 1976:		
False positive**	9	6%
High BP, but not placed on treatment***	5	3
Physician's diagnosis incomplete	2	1
Entered into treatment for hypertension	142	90
	<hr/> 158	<hr/> 100%

* Have not seen a physician for high BP since referral.

** Normal or borderline readings when seen by a physician.

*** BP readings reported by physician are high by program's screening standards ($\geq 160/96$).

Table IV also shows the status of those clients who were successfully referred. The false positive rate among this group was 6%, ie, 6% of these people were found by the physician to have normal or borderline blood pressure (below 160/96), and were not diagnosed as hypertensive. As noted above, the program did refer some people with borderline readings on subsequent screening dates, and many physicians did diagnose hypertension for people with sustained borderline readings.

It was felt that a false positive rate of 6% was well within tolerance levels, and that this rate supports the screening and referral procedures used. Had the false positive rate been above ten percent, the referral guidelines would have been adjusted to require a secondary screening for all people with high readings on the initial screening.

Screening, referral, and follow-up program for high blood pressure

The next category, "High BP, but not placed on treatment," includes people who were not diagnosed as hypertensive by the physician, but whose readings in the physician's office were 160/96 or higher. This figure allows an evaluation of the degree to which physicians in the community agree with the program's referral guidelines. Only 3% of the clients were referred to physicians who did not place them on treatment despite high readings, indicating a high degree of agreement among area physicians that sustained blood pressure of 160/96 or higher indicates hypertension. Similar findings have been reported by other demonstration programs using the same referral guidelines.⁹

In 1% of the cases, the physician had not yet completed a diagnosis of the client's condition as of June 1976, and further follow-up investigation is required to ascertain decision on treatment. The final piece of information in Table IV, evaluating the effectiveness of screening and referral, is the proportion of people successfully referred who entered into treatment for hypertension. As of June 1976, 90% of these clients were being treated for hypertension. These include people who had entered treatment for the first time, and those who had re-entered treatment after having dropped out. Again, this figure is similar to those of other demonstration programs in the area.⁹

Table V provides data on the effectiveness of follow-up and treatment for those clients under antihypertensive therapy. The first category, "Treatment just begun, or dropouts back into treatment," includes people who have not been in treatment long enough to show reductions in blood pressure. This 15% figure represents those clients who required a considerable amount of inducement to see their physician and begin (or re-enter) treatment.

Unsuccessful treatment due to non-compliant behavior on the part of the client was found to be a relatively small item. Only

Table V
EFFECTIVENESS OF
FOLLOW-UP AND TREATMENT

Status of clients under treatment for hypertension, as of June 1976:	Number	Percent
Treatment just begun, or dropouts back into treatment	21	15%
Unsuccessful treatment due to non-compliance re return appointments with the physician	6	4
Unsuccessful treatment due to non-compliance with prescribed therapy	9	6
Unsuccessful treatment, don't know why	5	4
Treatment changed, information pending re success of new therapy	6	4
Successful treatment or progress toward successful treatment*	95	67
	<u>142</u>	<u>100%</u>

* Blood pressure readings below 140/90 or significantly reduced since previous readings.

ten percent of the clients under treatment fell into this category — 4% were reported to be noncompliant in honoring return appointments with the physician, and 6% were not complying with their treatment regimens.

Other demonstration programs also report overall noncompliance rates of less than ten percent among their client caseloads.⁹ This lends support to one of the hypotheses developed during the course of these programs — that noncompliance is a relatively minor problem when effective follow-up procedures are employed. Throughout the follow-up activities, it was found that most of the problems experienced by clients that could or did lead to discontinuation from treatment, or "noncompliance" with treatment, were problems of misinformation or insufficient information. These people did not have to be "motivated to comply"; rather, they had to be given adequate information about their condition and about the prescribed treatment.

The fact that people do not comprehend or remember everything their doctor tells them is well known; people do not remem-

ber everything that anyone else tells them, either. But patients tend to be a little on edge in the doctor's office, anxious to get back to their other affairs, sometimes concerned about taking too much of the doctor's time, and often unable to frame their questions in time to ask them. It is not surprising, then, to find that many people discontinue medication because they do not know that they should refill the prescription; or because the doctor tells them on a subsequent visit that they are doing fine, and they think they are cured; or because they believe the drugs cause impotence; or because they have not understood the seriousness of high blood pressure. The follow-up activities allow these issues to be voiced and discussed in a less urgent atmosphere than that which sometimes exists in the clinic or doctor's office, and they provide the opportunity to clarify, interpret, and reinforce any instructions given to the client by the physician.

The fourth category in Table V, "Unsuccessful treatment, don't know why," includes 4% of the clients. These are people for whom the currently prescribed treatment is inappropriate or insufficient, along with people who are not complying with the treatment, but for whom there is no specific evidence to that effect. In three of these five cases, the physician reported that the client's blood pressure is "resistant to therapy," suggesting the need for changing or tailoring medication to the needs of the individual patient.

The next category, "Treatment changed . . .," includes people whose treatment has been recently changed by the physician, because of inadequate response to previous therapy. Of the clients under treatment, 4% were in this category.

Finally, the largest category in Table V, "Successful treatment or progress toward successful treatment," includes people whose blood pressure has dropped significantly since screening, and is below 160/96. Two-thirds (67%) of all clients under treatment were, happily, in this cate-

gory, as of June, 1976. This success rate, after an average duration of ten months of follow-up, is consistent with the success rates of other demonstration programs in south-eastern Michigan.⁹ However, none of these programs has continued long enough to provide any information about long-term maintenance of treatment.

The figures shown in Tables III—V represent information that few ongoing blood pressure screening programs can produce, either because (a) they do not do any follow-up, (b) they do not continue follow-up long enough to gather the information, or (c) they have no data system that allows them to compile and update the information. The development of a data management system that facilitates the storage and retrieval of information was essential to the success of the program. Moreover, the system had to be useful for service delivery purposes (eg, identifying those clients for whom a new follow-up action is appropriate; summarizing the blood pressure history of each client being followed), as well as for program evaluation purposes (eg, summarizing the current status of the entire client load; computing the number and type of contacts with each client and physician).

The core of the system used by the Henry Ford Hospital program is a coding system that allows the date, type, and outcome of each follow-up action to be coded, entered into the client's record, and updated in the caseload summary.⁸ The system is adaptable to computerization for quick storage and retrieval, but has been successfully managed as a paper system up to this time. This has allowed the program both to identify clients needing further follow-up actions, and to summarize the status of the entire caseload, producing the tables shown in this report.

Summary and conclusions

Our nation's health care delivery system is not organized to handle asymptomatic dis-

Screening, referral, and follow-up program for high blood pressure

eases. Health care is triggered primarily when a person feels sick and visits a physician. As a result, while hypertension is now largely controllable, it remains largely uncontrolled.

The successful control of widespread chronic diseases, especially asymptomatic diseases like hypertension, therefore seems to require a new set of service delivery activities for which our current system is unprepared and ill-equipped.^{12, 13} It requires procedures for (a) widespread screening for detection of people with the disease; (b) referral of those people to sources of medical care; and (c) routine, long-term follow-up to insure maintenance of appropriate treatment.¹⁴⁻¹⁹ The Henry Ford Hospital program represents an *auxiliary health service delivery system* to handle these problems of detection, referral, and long-term follow-up for people with hypertension. In the absence of such systems, we must expect that hypertension will remain as poorly controlled as it is today.

The blood pressure screening, referral, and follow-up program instituted by Henry Ford Hospital was developed as one such system. The program screened 808 people during the period of March 27 through December 11, 1975, and found 196 (24%) to have *uncontrolled* high blood pressure. These people were referred to a physician for further examination and evaluation, and the program is currently following up with these people (clients) and their physicians (as well as clients referred since that date) to insure successful referral and maintenance of treatment for those clients placed on antihypertensive therapy.

The program is committed to *long-term* follow-up with *both* the referred clients and their attending physicians (ie, for as long as the client is hypertensive and in the target population). The operational objectives of follow-up are (1) to gain information about the client's treatment status, and (2) to provide the client with the necessary support, information, encouragement, or assist-

ance in order to insure successful referral and maintenance of prescribed treatment.

The program's follow-up procedures rely primarily on mail and telephone contacts. During the initial wave of follow-up, the first interaction is through the mails—mailing a letter and follow-up form to each client and his/her physician. The second step is initiation of telephone calls to those clients and physicians who did not return the follow-up forms, and to those whose follow-up forms were incomplete, contradictory, or indicated unsuccessful referral. With the combination of mail and phone contacts during the initial wave of follow-up, the cumulative response rates were 90% among clients and 96% among physicians.

Subsequent follow-up contacts (by mail and/or phone) were carried out with clients and physicians about six months after successful referral, and are repeated about every six months for each diagnosed hypertensive in the client caseload. The response rate for these subsequent contacts has been very high among both clients and physicians (over 95%). Thus, in terms of being able to contact clients and physicians, the program's experience indicates that almost all will cooperate with the aims of follow-up, and will provide the necessary information by mail and/or phone.

Results of the program's follow-up activities with clients referred during March 27 through December 11, 1975, were evaluated through June, 1976. After an average duration of ten months of follow-up among the clients in this caseload, the following success rates have been recorded:

1. Of all referred clients, 86% were successfully referred (had visited a physician for high blood pressure after referral by the program);
2. Of the group successfully referred, 90% had been placed on treatment for hypertension, or had re-entered treatment after having dropped out; and

3. Of those under treatment for hypertension, 67% were showing successful treatment (blood pressure below 140/90) or were progressing toward successful treatment (blood pressure had dropped significantly since screening, below 160/96).

Additional investigation of referred clients shows a false positive rate of only 6% — low enough to support the program's screening and referral procedures. Furthermore, only 3% of the referred clients were not diagnosed as hypertensive even though their blood pressure readings were found to be 160/96 or higher by the attending physician. This low figure, along with similar findings of other programs in the community, indicates a high degree of agreement among area physicians that sustained blood pressure of 160/96 or higher indicates hypertension.⁹

Among those clients placed on antihypertensive therapy, noncompliance with the treatment regimen was found to be a relatively minor problem. Only 10% of these clients showed inadequate blood pressure control due to problems in honoring return visits to the physician or in complying with their prescribed treatment.

Throughout the follow-up activities, it was found that most of the problems experienced by clients that could lead to discontinuation from treatment, or "noncompliance" with treatment, were problems of misinformation or insufficient information. Patients seldom understand and remember *everything* their physician tells them, and tend to be reluctant to query the doctor about points they do not understand. It seems apparent that this kind of information has to be reiterated and reinforced a number of times, and the follow-up contacts provide this opportunity.

The high success rates experienced by the Henry Ford Hospital program are very similar to those reported by other programs using the same overall procedures.⁹ We feel that the program's success can be attributed to (a)

effective screening techniques, which emphasize consumer education about high blood pressure; (b) adequate referral guidelines, which are generally acceptable to medical practitioners in the area; and most importantly (c) supportive long-range follow-up procedures with both clients and their attending physicians.

The act of follow-up itself has a major effect on successful referral and maintenance of treatment. We call this a "program effect," and it works on physicians as well as clients. Regarding physicians, experience suggests that people referred by a screening and follow-up program are more likely to be diagnosed as hypertensive and placed on therapy than people coming to the physician for other reasons. This may be partly because the client is coming specifically about his/her blood pressure, and thus the physician pays special attention to it. And it may be partly because the physician receives a letter from the program which outlines the referral criteria, and provides some impetus for the physician to treat people with blood pressure readings above those criteria.

From the client's point of view, the act of follow-up itself serves to remind the client about his/her blood pressure condition; this is important in that an asymptomatic disease like hypertension is easy to forget about. Beyond the mere reminding, follow-up reinforces that the disease is serious enough for someone to spend the time and resources on a blood pressure control program. Finally, the fact that someone is concerned enough about *them* is, for some people, instrumental in inducing them to see a physician and to begin and maintain treatment.

In conclusion, the evidence indicates that the Henry Ford Hospital program has been quite successful at assisting hypertensive people to achieve adequate blood pressure control. The system used by the Henry Ford Hospital program has also been used in a number of other settings with similar success (eg, industrial sites, service organizations,

Screening, referral, and follow-up program for high blood pressure

drug stores).⁹ The principal advantage of the hospital setting is the immediate availability of treatment facilities.

This is not so much an advantage in terms of referral (except in communities where there are few practicing physicians), but more in terms of ease of follow-up. The cost of follow-up can be reduced if the follow-up staff has access to the patient records of a large proportion of the client load, as was the case at Henry Ford Hospital. Over 50% of the client load had chosen to be treated by physicians at the Hospital. (It should be reiterated, however, that access to the records did require a signed authorization by the patient/client. No patient record was requested without such an authorization.)

For this reason, people interested in instituting such a blood pressure control program may wish to consider doing so in a hospital setting, or in conjunction with a hospital. In addition to the public service aspects, there are more concrete benefits that may accrue to the hospital, including (a) an increase in its outpatient load by taking on *new* hypertensive patients and by experiencing a return of previous *dropouts* back into treatment, and (b) a future reduction in treatment dropouts among its hypertensive patients. This should result in increased revenues for the hospital, which can offset or help to offset the cost of the program.

It may also be noted that this type of follow-up program can be instituted in a private practice setting. The problem of dropouts from anti-hypertensive therapy would be greatly alleviated if more physicians instituted a procedure of follow-up with their patients, so that those who do not return for follow-up appointments are contacted and encouraged to do so. Of course, some patients may indicate, on being contacted, that they are seeing a different physician. But in most cases such a contact can serve to help clarify the problems and treatment of hypertension for the patients, and can encourage patients to express any diffi-

culties they are having with treatment, or misconceptions they might have about their situation. The use of nurses or trained paraprofessionals to do this follow-up work in a private practice probably would prove to be cost-beneficial to the practice, and certainly should improve the effectiveness of blood pressure control for patients with hypertension.

Acknowledgements

We wish to express our thanks to the volunteer nurses who make this program possible by giving freely of their time to screen hospital visitors and employees. These include the following nurses: Marilyn Bakirci, Wanda Beaver, Julia Caldwell, Mary Freeman Callahan, Patricia Dienst, Loretta Driesbach, Dorothy Dumke, Mary Hodgkinson, Betty Kelly, Dolly Peress, Lorene Perry, Mary Kay Thomas, and Akiko Yanari.

The program is coordinated by Velma Theisen, R.N., M.S.N., Health Nurse Clinician in Hypertension at Henry Ford Hospital, who now supervises the program's screening and follow-up activities; and Betty Vander Roest, who is in charge of the volunteer program at Henry Ford Hospital, assisted by Ann Tittingyung.

The Shared Health Education Program, under the direction of Harry Dalsey, M.P.H., offered staff assistance to this program.

This program would not have been possible without the assistance and support of the Hypertension Coordinating and Planning Council of Southeastern Michigan (HCPC), also known as BLOOD PRESSURE CONTROL. The forms and procedures for all program activities were initially provided by HCPC. From the inception of the program in March, 1975, through June, 1976, HCPC staff took the responsibility for carrying on follow-up activities with all people found to have elevated blood pressure readings when screened. In particular, we wish to thank

Erfurt, Foote, and Caldwell

Jean Schwan, R.N., who as a HCPC staff member was the first screening coordinator before that task was taken over by Velma Theisen; and Helen Barron, who acted as follow-up coordinator throughout that time.

Finally, we wish to acknowledge the work of the staff of The University of Michigan's

Worker Health Program in developing the hypertension control procedures discussed in this article; and in particular, we wish to thank Revera Munce, R.N., the Program's Nurse Supervisor; Patricia A. Strauch, Assistant Program Director; and Carol Kent, Program Secretary.

References

1. Kannel WB, Castelli WP, McNamara PM, McKee PA, and Feinleib M: Role of blood pressure in the development of congestive heart failure. *N Engl J Med*: **287**:781, 1972
2. Kannel WB, Wolf PA, Verter J, and McNamara PM: Epidemiologic assessment of the role of blood pressure in stroke. *JAMA*: **214**:301, 1970
3. Lew EA: High Blood Pressure, Other Risk Factors, and Longevity: The Insurance Viewpoint. *Am J Med*: **55**:284, 1973
4. Veterans Administration Cooperative Study Group on Antihypertensive Agents: Effects of treatment on morbidity in hypertension—Results in patients with diastolic blood pressures averaging 115 through 129 mm Hg. *JAMA*: **202**:1028, 1967
5. Veterans Administration Cooperative Study Group on Antihypertensive Agents: Effects of treatment on morbidity in hypertension. II. Results in patients with diastolic blood pressure averaging 90 through 114 mm Hg. *JAMA*: **213**:1143, 1970
6. Foote A, and Erfurt JC: *Development and Dissemination of Model Systems for Hypertension Control in Organizational Settings*. Institute of Labor and Industrial Relations, The University of Michigan—Wayne State University, Ann Arbor, 1974, p 8
7. Foote A, Erfurt JC, and Caldwell JR: A screening, referral, and follow-up program for high blood pressure at Henry Ford Hospital: Part I. Results of screening. *Henry Ford Hosp Med J* **24**:69-80, 1976
8. Erfurt JC, and Foote A: *BLOOD PRESSURE CONTROL: A Manual of Procedures for Screening, Referral, and Long-Range Follow-Up*. Institute of Labor and Industrial Relations, The University of Michigan—Wayne State University, Ann Arbor, 1976
9. Foote A, and Erfurt JC: Controlling hypertension: A cost-effective model. Submitted for publication to *Preventive Med*
10. Wilber JA, and Barrow JG: Reducing elevated blood pressure—Experience found in a community. *Minn Med*: **52**:1303-5, 1969
11. Caldwell JR, Cobb S, Dowling MD, and De Jongh D: The dropout problem in antihypertensive treatment. *J Chron Dis*: **22**:579-92, 1970
12. McKenney JM, Slining JM, Henderson HR, Devins D, and Barr M: The effect of clinical pharmacy services on patients with essential hypertension. *Circulation*: **48**:1104-11, 1973
13. Robinson AM: The R.N.'s goal: Under 90 mm. Hg. diastolic. *RN Magazine*: pp 43-49, May 1974
14. Charman RC: Hypertension management program in an industrial community. *JAMA*: **227**:287-91, 1974
15. Finnerty FA Jr.: New techniques for improving patient compliance. *The Hypertension Handbook*. West Point, PA, Merck & Co, Inc, 1974, pp 117-24
16. Freidman GJ: Critical issues seminar program. A presentation at the national management-labor conference on heart disease prevention in industry, January 24, 1972. *J Occupational Med*: **15**:60-1, 1973
17. Freis ED: Hypertension—A challenge in preventive cardiology. *Circulation*: **47**:1-2, 1973
18. Inter-Society Commission for Heart Disease Resources: Guidelines for the detection, diagnosis and management of hypertensive populations. *Circulation*: **44**:A263-72, 1971
19. Wilber J, and Barrow JG: Hypertension—A community problem. *Am J Med*: **52**:653-63, 1972.