The 90-Second Intervention: A Patient Compliance Mediated Technique to Improve and Control Hypertension

TANA FISHMAN

Ms. Fishman is a student at the Philadelphia College of Osteopathic Medicine. Her proposal won first place in the 1994 competition for the Secretary's Award for Innovations in Health Promotion and Disease Prevention. It has been edited and revised for publication. The contest is sponsored by the Department of Health and Human Services and administered by the Health Resources and Services Administration of the Public Health Service in cooperation with the Federation of Associations of Schools of the Health Professions. The entry was submitted by Philadelphia College of Osteopathic Medicine, Donna Farrell, DO, Faculty Advisor.

Tearsheet requests to Ms. Fishman, 1911 Spruce St., Philadelphia, PA 19103, tel. 215–546–1833.

Synopsis

Hypertension, a leading risk factor for cardiovascular and renal diseases, occurs in up to 50 million Americans. Despite mounting evidence of the effectiveness of prevention and treatment, physicians are still unable to get their patients to adopt and adhere to treatment protocols. This project presents an innovative approach to compliance which is based on general systems theory and its applications in family therapy.

The "90-Second Intervention" ("90 SI") incorporates the use of family and friends; it utilizes the therapeutic relationship or alliance of the physician-patient; and it embraces the well-established fact that social support plays a key role in promoting health, decreasing susceptibility to disease, and facilitating recovery from illness. The physician asks the patients to identify who in their life loves or cares for them and would help them adhere to the treatment protocol.

To implement the "90 SI," the physician instructs the patient to telephone, in his or her presence, the identified helper(s) who then agree to support the patients' medical regimen. Specifically, the "90 SI" seeks to create a context to support the patients in a regimen of low to moderate intensity exercise, which is proven to be a powerful, cost-effective, and safe treatment. Patients who are identified with new onset or uncontrolled hypertension at three clinics in urban Philadelphia are the target population.

APPROXIMATELY 50 MILLION, or one in four, adults in the United States have high blood pressure (BP) on the basis of observations at a single evaluation (that is, levels at or above systolic BP, 140 millimeter [mm] Hg or diastolic BP, 90 mm Hg) (*1*). It is believed that large numbers of hypertensives are unaware of their diagnosis and that many who are being treated for hypertension probably have suboptimal BP control (*1*).

Primary prevention of hypertension can be accomplished through interventions with the general population (*1*). Emphasis is directed to those persons with one or more lifestyle factors that contribute to age-related increases in BP. These lifestyle factors include high sodium chloride intake, excessive consumption of calories, physical inactivity, excessive alcohol consumption, and deficit intake of potassium.

Studies have shown that regular exercise of low to moderate intensity may benefit patients with hypertension (*1*). When exercise alone is not effective or hypertension is more severe, it is recommended that exercise be used as an adjunct to pharmacologic therapy (*2*).

The question to be asked, as Cassel and Cobb did (*3,4*), is what sort of patient has the disease hypertension? The sort of patient who has the disease is likely to be one who is not immersed in a strong supportive network or one who has recently experienced a disruption in his or her traditional sources of social support (*3,4*). "Whether one looks at marital status and friendship ties or at broader measures of community cohesion and cultural allegiance, . . . " (*5*) " . . . the results tend to confirm a highly visible relationship between the presence or absence of social support and one's health status" (*6*). The Working Group Report on Primary Prevention of Hypertension (*1*) states that persons who are exposed to stressful situations, but lack the decision-making ability to control their exposure and response to environmental stress, may be at special risk for the development of high BP (*7–9*).

Patient noncompliance, which is a well recognized

'Patients will be informed of the diagnosis and given instruction concerning weight control, sodium chloride intake, physical activity, reduced alcohol consumption, and potassium supplementation.'

although poorly understood phenomena, affects patients in all areas of health care. A recent study reports that patient noncompliance with medical therapy is responsible for 125,000 deaths each year, hundreds of thousands of hospitalizations, and millions of lost workdays (*10*). Focusing attention on the determinants of patient compliance is vital; they include increased frequency of outpatient visits, addition of home visits, recruitment of the patient's family to assist in supervision, feeding back to the patient objective evidence of noncompliance, and providing greater continuity of care (*11*).

Ramsey stated " . . . there is considerable evidence from many investigators, in many different settings, using many different illnesses and methods, that demonstrates that the family plays a major role in every step of the process of medical care. Whether the question is paying attention to a symptom, participating in a health promotion activity, or complying with a prescribed regimen, the family is a major player" (*12*).

How can the clinician initiate a treatment regimen that will be cost-effective, efficacious, and followed? How can these conditions be accomplished given the time demands of managed care and medical practices of today? The "90 SI," by transforming the patient's treatment context via the recruitment of significant others, considerably increases the probability of compliance: the physician and the patient's family become partners in the quest for adherence.

Literature Summary

"Non-compliance with medical advice for treatment has been a universal problem. The magnitude of the problem is evident when one considers that 'at least a third of the patients in most studies fail to comply with doctor's orders,' (*13*) and that one-third of the studies done report a non-compliance rate of 50% or more" (*14*). In a 1985 study (*15*), 50 percent of patients did not follow referral advice, 75 percent did not keep followup appointments, and 50 percent suffering from chronic illnesses dropped out of treatment within 1 year.

Many studies have examined patients' demographic characteristics such as age, sex, education, social class, and so forth. Few of these studies have found any association between these factors and compliance (*11*). In addition, associations between disease features and compliance are few, as well as associations between side effects and compliance (*11*). Haynes, however, stated that features of the therapeutic regimen are associated with compliance especially when one feature of the regimen concerns the degree of behavioral change required of the patient. He suggested that the degree of behavioral change required explains the decline in compliance. It is of considerable interest that health professionals are unable to distinguish between noncompliers and compliers among their patients (*11*).

Researchers have investigated the relationship between noncompliance and the severity of illness (*16*). Patients with rheumatic fever, ulcers, arthritis, or cardiac problems were not more compliant than others with less serious illnesses (*16–20*). The variable found to be associated most consistently with compliance has been the patient-physician relationship (*21–23*). Haynes also suggested that what was determined to show a positive association with compliance was degree of supervision and the patient's stated level of satisfaction with the physician and clinic (*11*). The results of studies are consistent and clearcut: good physician-patient relationships foster better results (*24*).

There is mounting evidence that the patient's larger context of family, friends, and social support system offers a significant contribution to compliance and, subsequently, improved health. Earp and coworkers (*25*) studied two social support strategies designed to lower hypertensive patients' blood pressure. She incorporated the use of patients' families and provided practitioner home visits. The results confirm the assertion of Taylor and coworkers (*26*) that attentive concern or sympathetic supervision by influential persons results in improvement in both compliance and blood pressure for hypertensive patients.

It has become increasingly apparent that, through simple communication, role modeling, deliberate pressure, and other avenues of influence, the family's beliefs and behaviors may affect its members' health actions. Heinzelmann and Bagley studied the factors influencing the undertaking and continuance of a fitness exercise program related to coronary heart disease (*27*). They concluded that ". . . the husband's pattern of adherence was directly related to his wife's attitude towards the program."

Hypertension offers a useful illustration of the

problem to adherence: more than 50 percent of hypertensive patients have been found to discontinue therapy within 1 year of starting treatment (*28–30*). Among patients who persist in medical treatment, an estimated 40 percent fail to take enough of their medication to achieve benefits (*31,32*). Doherty and coworkers, in their study on spouse support and health beliefs on medication adherence, found that the men who had highly supportive wives were significantly more likely to adhere to their medication regimen than were men with less supportive wives (*33*).

While the focus of attention in this project is on care of ambulatory nonhospitalized patients, it is important to consider those unusual clinical situations in which the family served to enhance the medical regimens. The New York University Medical Center Cooperative Care Program, opened in 1979, is a model system of delivering acute inpatient hospital care characterized by a family member or friend acting as a "care partner" who stays in the hospital with the patient. This nontraditional acute care has increased patient and family knowledge and satisfaction, adherence to the medical regimen, and appropriate self-management (*34*). It has decreased subsequent rehospitalizations and has decreased average lengths of stay remarkably (*34*).

An early theoretical framework for understanding the relationship between social support and health was elucidated by epidemiologist John Cassel in the mid-1970s. He noted that disrupted social ties affect the body's defense system such that the person becomes more susceptible to disease in general (*4*). A promising line of reasoning suggests that, over time, people's perceived sense of support from others may lead them to a more generalized sense of control (*35*) and serve to explain why social support might be among the factors that are critically related to health.

Project Objectives

The eight objectives of this project are

- to establish an urban-based clinic treatment for the prevention and control of hypertension,
- to establish a technique, the "90 SI," that will increase compliance,
- to establish a monitoring system that will identify noncompliance and facilitate interventions. The system will also serve to identify untoward side effects and provide for interventions,
- to establish a training program for primary care physicians in the area of patient compliance using the patient's social support system,
- to design and implement educational handouts concerning physical activity, sodium chloride intake, weight control, reduction of alcohol consumption, potassium supplementation, and other adjunct supplementation,
- to organize a larger social support network which will include patients and their help partners with a well-defined schedule and meeting format. The project will be named "Walk With a Partner for Health,"
- to introduce the community to the prevention and control of hypertension through the "Walk With a Partner for Health" network,
- to introduce and gain support for the early intervention, prevention, and treatment of hypertension through the health maintenance organizations and other insurance carriers providing coverage to clinic patients.

Methodology

The undertaking requires a project coordinator trained in family systems-family therapy who will manage and supervise. The primary care physicians and fourth year medical students (in clinical clerkships) associated and affiliated with the three urban clinics in Philadelphia will be trained to identify the patients, trained to use the technique of "joining," and trained to initiate the "90 SI."

Patients will be identified and classified with new onset primary hypertension or uncontrolled primary hypertension using the criteria established by the Joint National Committee On Detection, Evaluation, and Treatment of High Blood Pressure (JNC V) and based on the average of two or more readings taken at each of two or more visits following an initial screening (*36*).

The patient's medical history, physical examination, laboratory tests, and diagnostic procedures will be conducted according to the suggestions of the JNC V. Patients will be informed of the diagnosis and given instruction concerning weight control, sodium chloride intake, physical activity, reduced alcohol consumption, and potassium supplementation. They will be asked to identify that person—spouse or significant other—who cares for or loves them.

The physician will initiate the "90 SI" by asking patients to phone these significant persons (or invite these persons into the examining room if present in the office) and recruit their help in the low intensity exercise program. These "health partners" will agree to a brisk walk with patients for the prescribed duration and times—3–5 times per week for 30 minutes (*2*). The partners will confirm their participa-

tion to the physician and agree to a followup phone call to the project manager at the end of 1 week.

The project manager will record weekly reports and arrange a followup appointment in 1 month with the patients and the health partners. At that time, the patient will be examined, BP will be recorded, and the exercise program will be evaluated.

The project manager will identify lack of compliance at any time, and compliance will be reexamined at the next monthly appointment when choice of partner, exercise schedule, and understanding of diagnosis will be reviewed.

The patient will be reexamined monthly for a period of 6 months, and the health partner will make weekly call-ins for 6 months during "call-in time." Failure to telephone will lead the project manager to investigate.

Patients will be reexamined at months 9 and 12. Partners will reduce call-ins from a weekly to monthly schedule at the end of month 6. The project manager will provide reports and data to primary care physicians monthly and quarterly.

The project manager will coordinate the social support network. Groups of patients and partners will meet at the respective clinics on Saturday mornings at 10 a.m. for a 30-minute walk, discussion of relevant topics for 15 minutes, and a brief snack period. (Foods will be consistent with the therapeutic objectives.)

The project manager, clinic directors, and attending physicians will be available to the community to discuss the project, its importance and significance; discussions may be conducted at schools, churches, community centers, hospitals, housing developments, and neighborhood meeting areas.

The patients will be monitored for 1 year; new patients will enter the project for the first 6 months only; the remainder of the time will be devoted to maintenance and monitoring. A 1-year followup will be conducted; a post-test evaluation, brief interview with the patients and help partners, and BP readings will be obtained.

Significance of the Project

Patients will adopt and adhere to an exercise prescription that can improve or control their hypertension. This compliance mediated technique will generalize to other chronic diseases and to lifestyles exerting deleterious effects on patients.

The project demonstrates a 2 for 1 effect! The health partner also becomes a benefactor of the treatment regimen. The project demonstrates extra benefits: weight reduction, improved mood (decreased depression), improved cholesterol levels (increased HDLs), decrease in alcohol consumption, prevention of osteoporosis, and improved strength. This treatment of hypertension does not obligate the person and society to a substantial financial burden; the existing burden may be reduced.

The project offers a treatment modality that would, over time, save countless appointment hours. Findings from the investigation, based on the responses of the patients' significant others, could establish predictive data regarding compliance.

Project Innovations

The "90 SI" is an interactional and dynamic-based technique; physicians and medical students will be able to view the patient interacting with his or her context in the "here and now"; the physician knows immediately whether the patient has support for the regimen. Otherwise, it is left in the domain of hope.

The project invites the practitioner to view the social system as the agent of change and the physician's role as one of diagnostician and health educator. It moves the responsibility for treatment from the physician and redirects it to the patient and his or her social context. It offers a form of treatment that could potentially enhance the quality of the patient's life as well as his or her social context. Because treatment is extended to the partners, there is the potential for a mass effect. The project is kind, thoughtful, and generous to patients and their social context; it provides the much needed respect that serves to enhance any medical treatment.

Summary of Evaluation Methods

A two-part evaluation will be conducted: first, the effectiveness of the "90 SI" and second, the impact of the "90 SI." It has been hypothesized that noncompliance is endemic because physicians' directives are linearly based. When a systemic approach is used (recruitment of significant others), patients will adopt and adhere to medical regimens. Additionally, with increased compliance, hypertension will be prevented or controlled.

Pre- and post-treatment evaluations will include BP, EKG, SMA 12/24, height, and weight; and completing questionnaires about diet, alcohol use, smoking use, sodium chloride intake, vitamin supplementation use, physical activity, and medical history. Patients and their health partners will complete a standardized intake questionnaire with regards to demographic data. An additional questionnaire on their social network will collect data on the

composition of family, ethnicity, significant love relationship status, evaluation of friends, extended family description, and so forth. Finally, information will also be collected on lifestyle changes attempted in the past: type, duration, number of times, explanation of failure.

Exercise regimen data will be collected by self-report (health partner or patient). The medical staff will also record data on missed appointments, attendance at Saturday monthly meetings, change in health partner, change in family composition, change in medication regimens, family conflicts (those that interfere with the specific compliance activities), number of emergency meetings, and BP. Data will be analyzed using the Statistical Package for Social Sciences (SPSS). An informed consent will be signed before the recruitment of the social context.

Brief Budget Estimate and Justification

The cost of conducting the proposed program at three clinics for approximately 80–100 patients over a 1½-year period follows:

Category	*Cost*
Family systems consultant or family therapist (78 weeks × 40 hours)	$52,000
Fringe benefits (0.1389 percent)	7,222
Educational handouts for patients and social network—design and printing of 2,500 copies (5 topics) at $0.12 per copy	300
Training materials for physicians (video tapes, 25 at $25 each; books, 25 at $30 each)	2,125
Snack foods ("Walk With a Partner for Health," Saturday meetings) 60 meetings, on average, $30	1,800
Travel (between clinics) 100 miles per week, 78 weeks, at $0.25 per mile	1,950
Stationery, postage (design and printing, 300 pieces)	280
Software package (data base for organizing and collating information)	250
Evaluation analysis (contracted out)	500
Total	$66,427

References

1. National Heart, Lung, and Blood Institute: Working group report on primary prevention of hypertension. National Institutes of Health, Washington, DC, 1992, pp. i–46.
2. Yeater, R. A., and Ullrich, I. H.: Hypertension and exercise: where do we stand? Hypertension 91: 429–434 (1992).
3. Cassel, I.: An epidemiological perspective of psychosocial factors in disease etiology. Am J Public Health 64: 1040–1043 (1974).
4. Cobb, S.: Social support as a moderator of life stress. Psychosom Med 38: 300–313 (1976).
5. Marmot, M., and Syme, S.: Acculturation and coronary heart disease in Japanese Americans. Am J Epidemiol 164: 225–247 (1976).
6. Minkler, M.: The social component of health. Am J Health Promotion 1: 33–38, fall 1986.
7. Johnson, I. V., and Hall, E. M.: Job strain, workplace social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population. Am J Public Health 78: 1336–1342 (1988).
8. Johnson, I. V., Hall, E. M., and Theorell, T.: Combined effects of job strain and social isolation on cardiovascular disease morbidity and mortality in a random sample of the Swedish male working population. Scand J Work Environ Health 15: 271–279 (1989).
9. Theorell, T., et al.: Changes in job strain in relation to changes in physiological state: a longitudinal study. Scand J Work Environ Health 14: 189–196 (1988).
10. Trick, L. R.: Patient compliance—don't count on it! J Am Optom Assoc 64: 264–270 (1993).
11. Haynes, R. B.: A critical review of the "determinants" of patient compliance with therapeutic regimens. *In* Compliance with therapeutic regimens, D. L. Sackett and R. B. Haynes, editors. Johns Hopkins University Press, Baltimore, MD, 1976, pp. 26–39.
12. Ramsey, C. N., Jr.: The science of family medicine. *In* Family systems in medicine, C. N. Ramsey, Jr., editor. Guilford Press, New York, 1989, pp. 3–17.
13. Davis, M. S.: Variations in patient's compliance with doctor's advice: an empirical analysis of patterns of communication. Am J Public Health 58: 274–288 (1968).
14. Toledo, J. R., Hughes, H., and Sims, I.: Management of non-compliance to medical regimen: a suggested methodological approach. Int J Health Educ 22: 232–241 (1979).
15. Haynes, D.: The teaching of patient education concepts on therapeutic compliance to medical students. Bull NY Acad Med 61: 123–134 (1985).
16. Watts, D. D.: Factors related to the acceptance of modern medicine. Am J Public Health 56: 1205–1212 (1966).
17. Johannsen, W. I., Hellmuth, G. A., and Sorauf, T.: On accepting medical recommendations: experiences with patients in a cardiac work classification unit. Arch Environ Health 12: 63 (1966).
18. MacDonald, M. E., Hagberg, K. O., and Grossman, B. J.: Social factors in relation to participation in follow-up care of rheumatic fever. J Pediatr 62: 503–513 (1963).
19. Parker, L. B., and Bender, L. F.: Problems of home treatment in arthritis. Arch Phys Med Rehabil 38: 392–394 (1957).
20. Roth, H. P., and Berger, D. G.: Studies of patient cooperation in ulcer treatment: observations of actual as compared to prescribed antacid intake on a hospital ward. Gastroenterology 38: 630–633 (1960).
21. Francis, V., Korsch, B. M., and Morris, M. J.: Gaps in doctor-patient communications: patient's response to medical advice. New Eng J Med 280: 535–540, Mar. 6, 1969.
22. Ley, P., and Spelman, M. S.: Communicating with the patient. Staples Press, London, 1967, pp. 45–87.
23. Waitzlkin, H., and Stoeckle, I. D.: The communication of information about illness. Adv Psychosom Med 8: 180–215 (1972).
24. Smith, T. C., and Thompson, T. L., II: The inherent, powerful therapeutic value of a good physician-patient relationship. Psychosomatics 34: 166–170 (1993).
25. Earp, I. L., Ory, M. G., and Strogatz, D. S.: The effects of family involvement and practitioner home visits on the control of hypertension. Am J Public Health 72: 1146–1154 (1982).
26. Taylor, D. W., et al.: Compliance with antihypertensive drug therapy. Ann NY Acad Sci 364: 390–403 (1978).
27. Heinzelmann, F., and Bagley, R. W.: Response to physical activity programs and their effects on health behavior. Public Health Rep 85: 905–911, October 1970.

28. Caldwell, J. R., Cobb, S., Dowling, M. D., and Jongh, D.: The dropout problem in hypertensive therapy. J Chron Dis 22: 579–592 (1970).
29. Wilber, I. A., and Barrow, I. G.: Reducing elevated blood pressure: experience found in a community. MN Med 52: 1303–1306 (1969).
30. Wilber, I. A., and Barrow, J. G.: Hypertension—a community problem. Am J Med 52: 653–663 (1972).
31. McKenney, J. M., et al.: The effect of clinical pharmacy services on patients with essential hypertension. Circulation 48: 1104–1111 (1973).
32. Sackett, D. L., et al.: Randomized clinical trial of strategies for improving medication compliance in primary hypertension. Lancet No. 7918: 1205–1207, May 31, 1975.
33. Doherty, W. J., Schrott, H. G., Metcalf, L., and Iasiello-Vailas, L.: Effect of spouse support and health beliefs on medication adherence. J Fam Pract 17: 837–841 (1983).
34. Grieco, A. J., et al.: New York University Medical Center's Cooperative Care Unit: patient education and family participation during hospitalization—the first ten years. Patient Educ Counsel 15: 3–15 (1990).
35. Satariano, W., and Syme, S.: Life change and disease in elderly populations: coping with change. *In* Biology, behavior and aging, I. McGough, S. Keisler, and I. March, editors. Academic Press, New York, 1981.
36. National Heart, Lung, and Blood Institute: The fifth report of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure (JNC V). National Institutes of Health, Washington, DC, 1992, pp. 1–53.

LETTER TO THE EDITOR

What Incentives are Effective Rewards for 'Hidden Populations' Interviewed as a Part of Research Projects?

The results of a quasi-experimental study of incentives used to increase attendance at AIDS prevention sessions were recently published in *Public Health Reports* (*1*). In days past when principal investigators (PI) wrote grants and said they would recruit "x" number of subjects, much of the methodology in accomplishing this was left to the discretion of the PI. More recently, our grant reviewers, and as Deren et al. suggest, even the National Institutes of Health (NIH) have taken a stronger role and have suggested protocol changes, including changes related to the type of remuneration we offer our study subjects.

Some reviewers believe that incentives should not be given. However, one must balance the risk of "coercing the subjects"—especially vulnerable subjects—with the risk of losing subjects. Collecting data from vulnerable subjects and "hidden" populations for research projects is delicate for several reasons. These reasons become clearer when there is an awareness of who is included in these hidden populations.

Hidden populations are populations whose behavior is illicit and their members may not be known to society. The members of such populations may be persons who engage in behaviors such as crack cocaine use, IV drug use, prostitution; they may be felons, gang members, and burglars. They are also vulnerable populations such as homosexuals, African Americans, Hispanics, Asian Americans, and homeless persons. They are not represented in most studies, and the inclusion of such populations into our studies increases the value of our findings. So, while NIH has made inclusion of females and minorities mandatory, grant reviewers restrict the investigator's ability to recruit these populations into their studies by commenting on the amount of money and the type of renumeration which they allow us to provide to respondents.

Recruiting these persons in studies requires access through indigenous means. This might include canvassing bars, taverns, drug-copping areas, shooting galleries, public parks, prostitution strolls, laundromats, beauty shops, or bus stops. But one thing is certain: incentives make a difference in recruiting members of hidden populations.

During one of our grant reviews several years ago, the reviewers asked that food coupons be substituted for cash. After considerable experience with offering gift certificates from grocery stores, we have concluded that cash payments are preferable for a variety of reasons. Many participants view gift certificates as comparable to food stamps and feel stigmatized in receiving them. Certificates are often inconvenient to use because there is not a store located near the subject. Change over $5 has been permitted only in the form of additional gift certificates; this is time consuming to the user. An added frustration is that, in their ignorance that these certificates are used like cash, some checkers have been known to ask for identification before honoring them, which is an embarrassment for some of our subjects who often don't have any form of identification with them.

Overall, our subjects have indicated that they feel cash to be a more valued, dignified, and convenient form of payment for their time. Because of the considerable length of our interviews (2.5 hours on average), we feel that the extra incentive provided by cash is warranted in both treatment and community samples. We commend the authors for analyzing these data and the Editor of *Public Health Reports* for making the findings of this study known. Perhaps these findings will help applicants in their future grant reviews.

Linda B. Cottler, PhD; Wilson M. Compton, MD; Susan Keating, BSN; Washington University School of Medicine

References

1. Deren, S, et al.: The impact of providing incentives for attendance at AIDS prevention sessions. Public Health Rep 109: 548–553, July-August 1994.