Awareness, Use, and Impact of the 1984 Joint National Committee Consensus Report on High Blood Pressure

MARTHA N. HILL, PHD, DAVID M. LEVINE, MD, AND PAUL K. WHELTON, MD

Abstract: A random sample of Maryland physicians stratified by practice specialty (family, general, internal medicine, cardiology, and nephrology) was surveyed before and one year after dissemination of the 1984 Report of the Third Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure (The JNC III Report). Fourty-four per cent of the total eligible sample responded to both questionnaires. One year after publication, 62 per cent of physicians participating in both parts of the study were aware of the report. Although availability of a copy (58 per cent), familiarity with the recommendations (81 per cent), and the extent to which care was based on the guidelines (65 per cent) were high, use of the report in practice (17 per cent) and the amount of change in practice behavior required to adhere to the guidelines (18 per cent) were low. Prior to publication of the report, more than two-thirds of responding physicians were found to be practicing in a manner congruent with nine of ten treatment recommendations studied. One year after JNC III's release, they reported practice behavior which was not significantly different. It seems that this consensus report codified, rather than changed, practice behavior in this sample. (*Am J Public Health* 1988; 78:1190–1194.)

Introduction

Consensus statements are being developed with increasing frequency by professional associations, voluntary health agencies, and the federal government. Their purpose is to summarize the scientific literature and to promulgate up-to-date guidelines for practice and policy development.[1–3] Yet little is known about how much attention consensus reports receive from physicians or how effective they are in influencing the practice behavior of physicians.[1–4]

Most studies show incomplete and inconsistent adherence to consensus statement guidelines.[5–10] For example, except for cervical cancer screening, physicians tend to perform periodic health examination and/or cancer screening procedures less often than recommended.[11–14] In the two cross-sectional studies previously published comparing practice with recommendations for detection and treatment of high blood pressure, Thompson, *et al*,[2] reported that medical practice was more aggressive, and Cloher and Whelton[10] concluded that it was more conservative than the recommendations at the time their data were collected.

In 1983, the Director of the National Heart, Lung, and Blood Institute (NHLBI) appointed a committee to produce a third Report of the Joint National Committee (JNC) on Detection, Evaluation, and Treatment of High Blood Pressure (JNC III).[15] The committee was charged with updating earlier consensus reports on high blood pressure[16,17] and providing additional guidelines based upon new data published since the preceding report was published in 1980.

The objective of the present study was to examine both the diffusion of the JNC III consensus report and the adoption by physicians of its recommendations for medical practice, guided by the "diffusion of innovations" framework developed by Rogers and others.[18] In this framework, a source (the sponsor, NHLBI) sends a message (information in the JNC III Report) via certain channels (journals, CME meetings, etc.) to the receiving individual (the physician) who decides whether or not to adopt the innovation (the guidelines). We sought answers to the following questions:

- To what extent were physicians aware of the JNC III Report one year after its release?
- From what communication channels did physicians receive their copy of the report?
- To what extent did physicians aware of the JNC III Report one year after publication use it and follow its recommendations?
- To what extent did physician practice behavior differ one year following the issuance of the JNC III Report from that prior to its issuance?
- Was there a difference in the practice behavior of physicians depending upon whether they were aware of the report?

Methods

Sample

A stratified random sample was drawn from five strata of licensed Maryland physicians who were likely to be caring for persons with high blood pressure (family, general, internal medicine, cardiology, and nephrology specialties). Ineligibility for inclusion in the study was determined by death, retirement, out-of-state residence, or not providing patient care (162/787 reviewed). A 50 per cent response rate (N = 312) to the initial (pretest) questionnaire was obtained from the 625 eligible physicians in the six weeks between the initiation of the study and publication of the JNC III Report on May 4, 1984.[18] In May 1985, a second questionnaire (posttest) was mailed to the 625 physicians eligible at the pretest. Thirty additional physicians were ineligible at the time of the posttest, reducing the target population to 595. The response rate (68 per cent) was better than that obtained in the first survey. This was most likely due to the longer follow-up period (12 vs six weeks) for repeated mail and telephone reminders. Overall, 76 per cent of the 595 physicians eligible at the posttest participated in the study constituting the following three response groups; pretest-only 8 per cent (N = 50), posttest-only 24 per cent (N = 142), the panel 44 per cent (N = 262) both the pretest and the posttest.

Procedures

In the first questionnaire (pretest), mailed in March 1984, the physicians were asked to participate in a two-part survey regarding high blood pressure detection and treatment practice patterns and their sources of medical information or advice which may influence their practice.

From the Department of Behavioral Sciences and Health Education, Johns Hopkins School of Hygiene and Public Health, Baltimore, Maryland. Address reprint requests to Martha N. Hill, PhD, RN, Johns Hopkins University, School of Nursing, Houck 375, 600 N. Wolfe Street, Baltimore, MD 21205. This paper, submitted to the Journal August 19, 1987, was revised and accepted for publication February 10, 1988.

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TABLE 1—Physician and Practice Characteristics of Panel (N = 262) by Specialty

	Family and General Practice (N = 81)	Internal Medicine (N = 101)	Cardiology and Nephrology (N = 80)
Physician Characteristics			
Mean Age (SD)	55 (±14)	49 (±12)	47 (±10)
Male (%)	91	91	97
White (%)	86	87	82
Board Certified (%)	56	71	90
Practice Characteristics			
Solo practice (%)	67	51	27
Single specialty group (%)	18	18	35
Other (%)	15	31	38
Urban/suburban location (%)	74	87	89
Great deal or some time per week caring for hypertensive patients (%)	97	87	80

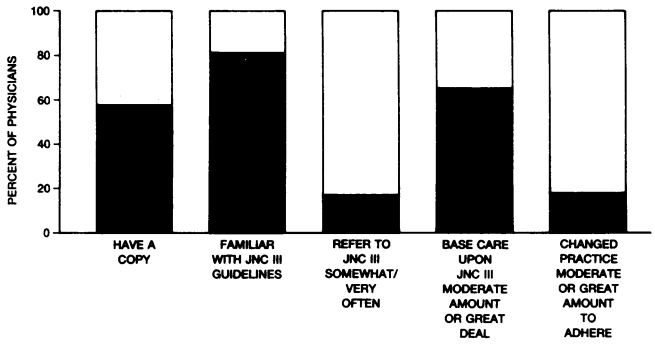

FIGURE 1—Response to the JNC III Report of Physicians Aware of the Report (N = 262) One Year after Publication

The first questionnaire asked about demographic and practice characteristics and sources of medical information. The second questionnaire asked about awareness and use of the JNC III Report. In addition, the pretest and posttest asked identical questions about a series of practice behaviors related to selected treatment recommendations contained in the JNC III Report. Examples are presented in the Appendix.

To determine whether either revisions in recommendations and changes in emphasis of recommendations influenced the behavior of physicians, an independent group of six physicians and health educators reviewed the texts of the 1980 JNC II and the 1984 JNC III Reports. This group judged the newness and emphasis of each JNC III recommendation studied. Ninety per cent agreement among the six reviewers was used to assign revision and emphasis ratings to each JNC III recommendation studied.

To examine the extent to which the self-reported practice behavior of physicians agreed with JNC III recommendations, a second independent group of 20 physicians not involved in the study reviewed each question and its responses (see Appendix) and the related JNC III text. They were asked to select those answers that were congruent or not congruent with the JNC III text. The questions, answers, and congruent responses (as defined by 90–100 per cent of the reviewers) are presented in the Appendix.

Results

Physician and Practice Characteristics

The demographic, professional, and practice arrangement characteristics of physicians in the three groups (pretest-only, the posttest-only, and the panel) were essentially similar when the panel (N = 262) was compared to the pretest- and posttest-only groups (N = 50 and 142). For this reason, and to examine changes within one group of individuals, we chose to analyze more fully only the data obtained from "the panel" of physicians who responded to both questionnaires. Professional, sociodemographic, and practice characteristics of the physician specialty subgroups in the panel are presented in Table 1. Family and general practitioners, who were older, spent more time per week caring for hypertensive patients and were more frequently located in solo practices. Cardiologists, nephrologists, and internists were more likely to be board certified, practice in a group, and be located in urban/suburban areas.

Awareness

Sixty-two per cent of the physicians in the panel reported that they were aware of the existence of the 1984 JNC III Report at the time of our second questionnaire (posttest) and constitute the "aware" group. More cardiologists and nephrologists were aware than family and general practitioners and internists (75 per cent vs 59 per cent and 55 per cent). Of the 162 physicians aware of the JNC III Report, 64 per cent (N = 87) reported receiving one copy; 27 per cent (N = 37) reported receiving two or more copies; only 9 per cent (N = 13) had not received a copy from any source. Of those aware of the report, 23 per cent indicated the source(s) from which they received their copy(ies): pharmaceutical company representative (N = 38), professional journal (N = 37), and professional association mailing (N = 36). A strong association existed between awareness of the report and the number of copies (0–3) received.

Use of Report

Fifty-six per cent of the 162 physicians aware of the JNC III Report specified that they "never" (35 per cent) or "infrequently" (21 per cent) referred to it. Only 6 per cent referred to it "very often". The remainder (26 per cent) reported that they referred to the guidelines "somewhat infrequently". Eighty per cent of aware physicians reported that the extent to which their care of hypertensive patients was based upon JNC III recommendations, was "not at all" (17 per cent), "very little" (19 per cent), or only "a moderate amount" (44 per cent); 76 per cent of those who based their care on JNC III to whatever extent estimated the amount of change required of them in order to adhere to the recommendations as "very little". Although awareness of the report (62 per cent), availability of a copy (58 per cent), familarity with the recommendations (81 per cent), and the extent to which care was based upon the JNC III guidelines (65 per cent) were high, use of the report in practice (17 per cent) and the amount of change in practice behavior required to adhere to JNC III recommendations (18 per cent) were low (Figure 1).

Family and general practitioners more frequently referred to the report and based their care upon the recommendations more often than their counterparts in internal medicine or other specialty practice (data not shown).

TABLE 2—Percentage of Panel Pretest and Posttest Responses Coded as Congruent With JNC III Recommended Practice Behavior by Practice Specialty

Recommended Practice Behavior	Family and General Practice (N = 81)		Internal Medicine (N = 101)		Cardiology and Nephrology (N = 80)		Total Sample (N = 262)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Unrevised, No Increased Emphasis								
Average ≥2 BPs on ≥2 visits to diagnose	71	67	71	73	70	71	70	71
Reduce drug dose if BP controlled ≥6–12 months	90	95	98	96	97	99	95	96
Unrevised, Increased Emphasis								
Use beta-blocker drug as initial therapy	79	73	79	78	77	72	78	75
Revised, No Increased Emphasis								
Prescribe drugs:								
Diuretic alone unless beta-blocker	90	90	96	90	91	85	93	88
Diuretic and one antihypertensive	71	75	77	69	57	67	69	70
Three or more antihypertensives	77	80	69	70	63	65	69	70
Revised, Increased Emphasis								
Recommend or Prescribe:								
Sodium restriction diet	69	67	68	60	74	73	70	70
Calorie reduction diet	89	90	86	78	84	85	87	84
Exercise program	64	70	70	69	64	70	66	73
Behavioral therapy	37	52	23	25	15	21	25	31

Impact on Practice Behavior

None of responses to the questions measuring 10 recommendations differed greatly, and few differences were found when congruency patterns were examined among practice specialties (Table 2) (McNemar Test[19]).

Awareness of the JNC III Report had no effect on each of the 10 recommended practice behaviors studied or on congruent practice behavior when the number of congruent responses was summed for each physician. Furthermore, familiarity with the content of the JNC III Report, although a stronger determinant of congruent practice behavior than awareness, was not found to be a significant determinant of practice behavior.

Discussion

To our knowledge, this is the first study to use a pretest-posttest design in order to examine the awareness of physicians of a nationally promulgated consensus report and to evaluate the behavioral responses of that single group of physicians to the recommendations presented. A limitation to the present study is that only 44 per cent of the eligible sample responded to both parts of the study.

The 62 per cent awareness rate one year after release of the JNC III Report is a measure of the success of the dissemination effort and indicates a high degree of long-term awareness among respondents. Jacoby and Clark[3] studied awareness of a National Institutes of Health (NIH) osteoporosis consensus conference and the resulting statement two months after its release. In a randomly selected group of St. Louis, Missouri specialists (general/family practice, general internal medicine, obstetrics/gynecology, orthopedic surgery, and geriatrics) which received the report by direct mail from NIH, 40 per cent said they were aware of the conference and 54 per cent of these were aware of its conclusions. A subgroup of gerontologists who were on the direct mail list reported 56 per cent awareness of the conference. The control group of similarly selected Cleveland, Ohio, physicians, which was not on the NIH direct mailing list, learned about the report through the dissemination channels common to other consensus conferences, and indicated much lower levels of awareness of the conference (27 per cent) and of conference results among those aware of the conference (31 per cent).

The sources in our study from which the physicians reported receiving their copy(ies) of the report (pharmaceutical company representative, professional journal, and professional association mailing) are similar to the findings of others on sources of new medical information.[20–22] In contrast to Coleman's classic study[23] in which "other physicians" were the primary source of new information, we found "other physicians" to be an infrequent source of the JNC III Report. However, since 77 per cent of physicians did not mention the source of their copy of the report, our finding must be viewed with caution. Jacoby and Clark[3] found that 22 per cent of their direct mailing group could correctly identify the source of their copy of a consensus report several months after its publication.

In our study, awareness of the JNC III Report and familiarity with its content did not appear to change practice behavior. Indeed, the responses of physicians in this study suggest that utilization of the JNC III Report is minimal. Although the majority of physicians aware of the report were generally familiar with its content and 65 per cent reported basing their care upon it "a moderate amount" or more, few (18 per cent) reported referring to it "somewhat or very often" and most (82 per cent) indicated that there had been "very little" if any change in their practice behavior.

On the whole, when pretest and the posttest data were compared, the percentage of responses congruent with recommendations was high. Where the percentages of congruency were large, e.g., in the prescription of diuretics as single drug therapy, the recommendation had been widely known for a long time, and it was essentially unchanged from the earlier JNC report.[17] Where the percentages of congruent responses were smaller, e.g., recommendation of behavioral

therapies (relaxation, biofeedback, etc.), studies and communications strongly supporting the recommendation were fewer, the treatments were newer and more complex to implement in practice, and long-term blood pressure control was achieved less often.

A major finding is the extent to which self-reported practice was congruent with many of the recommendations contained in the consensus report *prior* to its publication. Two possible explanations are that physicians had already changed their practice in response to information they had received[24,25] and/or that the language of the guidelines is so broad and general that the responses of physicians fell within "congruent" categories.

New information about high blood pressure seems to have diffused into the physician community independently of the JNC III Report through a wide variety of channels. Thus, physician practice had largely changed in advance of the dissemination of updated JNC III national consensus recommendations. Our results may differ from those for a consensus report about another topic with less well developed state of knowledge and practice patterns. They seem to suggest that this particular revised consensus report codified rather than altered physician practice with respect to treatment. It is difficult to show change when there are already high levels of congruence. Evidence here and elsewhere[2,11] indicates that physicians have made major changes in the care of the hypertensive patient in the past 15 years. An additional important issue is the fundamental principal that patient care should be individualized. Thus, often the wording of recommendations is conditional and permissive and the methods with which adherence to recommendations is evaluated are imprecise. Additionally, the JNC III Committee had representation from diverse, broad-based organizations which were in the forefront of high blood pressure control efforts. A committee with differnt composition might have produced a document less clearly related to the current state of practice.

It is possible that several types of bias may have influenced the interpretation of our results and conclusions. Our response rates were less than optimal for survey interpretation, although they met or exceeded the assumption of our sampling design and resemble those seen in similar physician mail surveys.[26,27] It is possible that the physicians who chose to participate in both parts of the study differed from those who did not. Howver, the sex, race, years in the profession or practice, county, and specialty of participants in the panel were quite similar to those of respondents to the pretest or posttest and to nonrespondents. Furthermore, additional sociodemographic and practice characteristics and practice behavior did not differ among the panel and respondents to the pretest and posttest. Thus, we have no evidence that the physicians included in this analysis differ from other Maryland physicians in these practice specialties.

Further investigation is needed to systematically address: the development, dissemination, and effect of consensus reports, which have as a primary intent changing practice behavior; and topics about which consensus has not yet been reached.

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APPENDIX
Selected Questions and Responses*

Which one of the following most closely resembles the method by which you usually determine the level of blood pressure (BP) to diagnose or confirm a diagnosis of hypertension?

One BP determination	1
The average of two or more BP determinations on a single visit	2
One BP determination on each of two or more visits	3
The average of two or more BP determinations on two or more visits	4
Other (please specify)	5

For approximately how many of your hypertensive patients do you recommend or prescribe the following? (Circle one in each row)

	All	Most	Some	Few	None
Nonpharmacologic Therapy					
Sodium restriction	5	4	3	2	1
Calorie reduction diet	5	4	3	2	1
Exercise program	5	4	3	2	1
Behavioral therapy (relaxation, biofeedback, etc)	5	4	3	2	1
Pharmacologic Therapy					
Diuretic alone	5	4	3	2	1
Diuretic and one other antihypertensive drug	5	4	3	2	1
Three or more antihypertensive drugs	5	4	3	2	1

During the past year how often have you reduced ("stepped down") drug dosages in patients whose blood pressures have been controlled?
Always; Very often; Usually; Rarely; Never

During the past year how often have you used beta-blocker drugs alone as initial therapy for treating hypertensive patients?
Always; Very often; Usually; Rarely; Never

*Responses coded as congruent with JNC III recommendations are underlined.

REFERENCES

1. Perry S: The NIH consensus development program. N Engl J Med 1987; 317:485–488.
2. Thompson GE, Alderman MH, Wasserteil-Smoller S, *et al:* High blood pressure diagnosis and treatment. Am J Public Health 1981; 71:413–416.
3. Jacoby I, Clark SM: Direct mailing as a means of disseminating NIH consensus statements. JAMA 1986; 255:1328–1330.
4. Kessler DM: Diffusion of new medical information. Am J Public Health 1981; 71:367–368.
5. Gleicher N: Cesarean section rates in the United States: The short-term failure of the National Consensus Development Conference in 1980. JAMA 1984; 252:3273–3276.
6. Brooks SL: Survey of compliance with American Heart Association guidelines for prevention of bacterial endocarditis. J Am Dent Assoc 1980; 101:41–43.
7. Jordan HS, Burke JF, Fineberg H, *et al:* Diffusion of innovations in burn care: Selected findings. Burns Incl Therm Inj 1983; 9:271–279.
8. Sadowsky D, Kunzel C: Clinician compliance and the prevention of bacterial endocarditis. J Am Dent Assoc 1984; 109:425–428.
9. Retchin SM, Fletcher RH, Buescher PC, *et al:* The application of policy: Prophylaxis recommendations for patients with mitral valve prolapse. Med Care 1985; 23:1156–1162.
10. Cloher TP, Whelton PK: Physician approach to the recognition and initial management of hypertension: Results of a statewide survey of Maryland physicians. Arch Intern Med 1986; 146:529–533.
11. Weisman CS, Celantano DC, Hill MN, *et al:* Pap testing: Opinion and practice among young obstetrician-gynecologists. Prev Med 1986; 15:342–351.
12. Romm FJ, Fletcher SW, Hulka BS: The periodic health examination: Comparison of recommendations and internists' performance. South Med J 1981; 74:265–271.
13. Cohen DI, Littenberg B, Wetzel C, *et al:* Improving physician compliance with preventive medicine guidelines. Med Care 1982; 20:1040–1045.
14. Woo B, Woo B, Cook EF, *et al:* Screening procedures in the asymptomatic adult: Comparison of physicians' recommendations, patients' desires, published guidelines, and actual practice. JAMA 1985; 254:1480–1484.
15. The 1984 Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure: The 1984 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood

Pressure. Arch Intern Med 1984; 144:1045–1057.
16. The Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure: Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure. JAMA 1977; 237:255–261.
17. The Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure: The 1980 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure. Arch Intern Med 1980; 140:1280–1285.
18. Rogers EM: Diffusion of Innovations, 3rd Ed. New York: Free Press, 1983.
19. Siegel S: Nonparametric Statistics. New York: McGraw-Hill, 1956.
20. Stross JK, Harlan WR: The dissemination of new medical information. JAMA 1979; 241:2622–2624.
21. Stinson ER, Mueller DA: Survey of health professionals' information habits and needs. JAMA 1980; 243:140–143.
22. Stross JK, Harlan WR: Dissemination of relevant information on hypertension. JAMA 1981; 246:360–362.
23. Coleman J, Menzel H, Katz E: Social process in physicians' adoption of a new drug. J Chronic Dis 1959; 9:1–19.
24. Eddy DM: Clinical policies and the qualtiy of a clinical practice. N Engl J Med 1982; 307:343–347.
25. Young DA: Communication linking clinical research and clinical practice. *In:* Roberts EB, Levy RI (eds): Biomedical Innovation. Cambridge, MA: MIT Press, 1981; 177–199.
26. Grim RH, Leupker RV, Blackburn H, Arkin RM: Cardiovascular disease prevention: Attitudes and practice habits of community physicians [Abstract]. Circulation 1983; 68:III–160.
27. Liberati A, Patterson BW, Biener L, McNeil BJ: The impact of early breast cancer randomized clinical trials on the practice of medicine [Abstract]. Controlled Clin Trials 1985; 6:231.
28. Battista RN: Adult cancer prevention in primary care: Patterns of practice in Quebec. Am J Public Health 1983; 73:1036–1039.
29. Curry J, Putnam RW: Accuracy of physician's self-reported practice profiles. Annu Conf Res Med Educ 1981; 20:29–33.

Nurses Oppose AMA Proposal for 'Registered Care Technologists'

The American Nurses' Association (ANA) has expressed outrage at a recent move by the American Medical Association (AMA) to create a new category of health care provider—called the "Registered Care Technologist"—to solve the current nursing shortage. ANA's response followed a June 29 action by the AMA House of Delegates to establish pilot programs to train RCTs despite objections raised by ANA and 45 other national nursing organizations.

According to the AMA plan, RCTs would be high school graduates trained on an "earn while you learn" basis in a hospital setting. The RCTs would have two months, nine months, or 18 months of training, would execute physicians' orders at the bedside, would be accountable to physicians, and be extended the right to practice by state medical boards.

ANA President Lucille A. Joel, EdD, RN, called the AMA plan "short-sighted and ill-conceived," saying that it does not address the nursing shortage and its causes. Noting that there are now more working nurses than ever before, and more in direct patient care, Joel said, "We have a nursing shortage because of the increased demand for nurses in a health care system in which patterns of delivery are changing."

According to ANA, adequate compensation, improved working conditions, and a voice in decisions that affect patients will help retain nurses and also attract new people into the profession. ANA feels that organized medicine could help nurse recruiting efforts by visibly supporting the need for higher wages. In 1986, physician income increased by 10 per cent, with average annual MD earnings at $112,790. By comparison, the average maximum salary for hospital-employed RNs was $27,744, in 1986 and $29,088 in 1987, a 4.8 per cent increase.

The nursing profession is urging the public and the medical profession to help maximize the efficiency of existing RNs and LPNs through the use of existing support staff such as nurses aides, clerical help, dietary aides and transport personnel. Conversely, "The introduction of minimally-trained personnel at the bedside, operating rooms and intensive care units will jeopardize patient safety and increase the malpractice exposure of individual physicians," said Joel. "Nurses will have no part in jeopardizing the quality of patient care or in escalating the cost of care in this manner."

Training, certification, and compensation for RCTs would be paid for by health care consumers who are already supporting an over-burdened, expensive health care system, the ANA news release stated, adding that state governments will be required to support the system to register RCTs through state medical boards, which are public agencies. Joel said, "The AMA's action is but the latest attempt, literally at the expense of the public, to continue to exercise control over the health care system. In addition to diluting the quality of care delivered to consumers, one of the primary effects of the proposal will be to enhance the monopoly power of physicians in the health care marketplace. Nursing will not let this happen. We intend to do whatever it takes to resolve the nursing shortage and to continue to assure that consumers have access to and are provided with quality, cost-effective nursing care," said Joel.

The American Nurses' Association is the national professional organization representing the nation's two million registered nurses, with headquarters at 2420 Pershing Road, Kansas City, MO 64108. Tel: 816/474-5720.