Using Review of Medical Clinic Charts To Teach Occupational Health

Rosemary K. Sokas, M.D., Lucia Orellana, and Susan C. Day, M.D.

Abstract—The authors evaluated the effectiveness of chart audit with written feedback as a tool for encouraging second- and third-year residents to obtain and record occupational information during history-taking. Baseline information was obtained by reviewing the charts of 20 residents of patients who presented for complete history-taking and physical examination and scoring for various aspects of occupational history-taking. Intervention was directed at 10 of the residents; the other 10 served as controls. Between five and 12 charts were reviewed for each of the 10 residents in the intervention group; the scoring sheet, scoring criteria, results, and a brief discussion of potentially relevant occupational concerns for the given patient were returned to the resident, along with copies of the relevant pages of the patient's record. Chart review showed no difference in total scores for occupational history-taking between the two groups before intervention. The postintervention scores improved insignificantly for the intervention group; however, the scores deteriorated significantly for the control group (1.38 to 0.92, $.05 > p > .025$).

Although historically occupational health has been neglected in the practice of clinical medicine, recognition of its importance in the delivery of primary health care has become widespread over the past decade (1–3). As of 1985, slightly more than half of the U.S. medical schools required occupational health instruction (median required time = 4 hours [4]), and family practice residencies required formal occupational medicine curricula. In September 1984 the American College of Physicians (ACP) issued a position paper titled "Role of Internist in Occupational Medicine." It stated that:

> 1. Physicians, especially primary care internists, must address the occupational health care needs of their patients. Physician responsibilities in providing care to patients of working age include identification of occupational and other environmental health risks, treatment of disease and injury, and patient counseling about preventive behavior.
> 2. Physicians have a responsibility to improve the health of the population by working to prevent occupational and other environmental risks that cause injuries and diseases.

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Dr. Sokas and Dr. Day are assistant professors of medicine, University of Pennsylvania School of Medicine, Philadelphia, and Ms. Orellana is a research assistant, Hospital of the University of Pennsylvania, Philadelphia.

Primary care physician performance in occupational medicine, however, remains poor. In a chart review conducted in one family practice residency, the faculty members and residents obtained some information on employment status for 24 percent of the patients; for only 2 percent of the patients was the occupational history considered to be complete (5).

In the study reported here, the authors investigated the use of a record audit and written feedback as a method for improving internal medicine residents' incorporation of occupational health information into the outpatient medical record.

Methods

In the summer of 1984, 20 internal medicine residents at the Hospital of the University of Pennsylvania were randomly selected for the study. Half were in postgraduate-year two (PGY-2), and half were in PGY-3. Ten of the residents had spent varying amounts of time on a block ambulatory rotation as part of a primary care internal medicine residency program. The other 10 had spent no time in ambulatory care beyond the usual internal medicine clinic. The primary care program residents were the intervention group, and the regular internal medicine program residents were the control group.

A baseline chart audit was conducted to determine whether differences existed between the collection of occupational history by the primary care residents and by the regular internal medicine residents. For each resident, four records of new patient encounters at the general medicine clinic were selected, two male and two female patients under age 70. The patients were new to the resident but not necessarily to the general medicine clinic. The patients' age, sex, and employment status (employed or unemployed) were also recorded.

The chart audit gave equal credit for information relating to either employment or unemployment. An open-ended score was generated by giving each piece of occupational information one point. For example, the notation that a patient was a retired janitor with no known asbestos exposure would generate three points: one each for employment status, job title, and presence or absence of an occupational exposure. Occupational information was rated regardless of whether it was obtained by the resident at the initial evaluation or by other clinic providers at any time previously. Information obtained by clerical personnel for billing purposes was not included.

Coded sample records were independently scored by all three of the investigators with a high degree of initial concordance that was further developed through discussion into a consensus on the final score for each chart. Review of the remaining study records was conducted by a single investigator, and questionable records were rescored by the other investigators, neither of whom had knowledge of the first scoring, so that a consensus score could be developed. The results of the baseline audit were not given to the residents.

All 20 house staff members then received a copy of the ACP position paper, "Role of Internist in Occupational Health," and a cover letter from the director of the primary care program and the coordinator of the Occupational Health Working Group of the hospital's Section of General Medicine. This cover letter emphasized the importance of obtaining occupational histories for the routine management of common outpatient problems, such as diabetes and hypertension, and for detecting more strictly defined occupational disease and explicitly requested the house staff to obtain infor-

mation regarding employment status, job description, and known hazards for every patient.

Intervention was then begun. The 10 primary care residents in the intervention group had charts from routine patient visits to the medical clinic audited over the subsequent four to 12 months. Between five and 12 charts were audited per resident (mean = 8.6). Following each chart audit, the resident received the scoring sheet, with the criteria for coding explicitly stated, and written comments pointing out occupational and/or environmental factors with the potential for initiating or exacerbating the more common general medicine problems (such as osteoarthritis, hypertension, chronic obstructive lung disease). The resident also received photocopies of the relevant pages of the record. The residents in the control group received no audits or feedback.

Following intervention, four new patient records were again evaluated, and the occupational information reported was compared with baseline performance for each resident. One house officer from the intervention group and one from the control group left the internal medicine residency program, but the evaluation was completed for the remaining 18 residents. Because the residents saw fewer new patients toward the end of their residency, it was not possible to require even numbers of male and female patients or to exclude patients over age 70 for the postintervention review. However, the results of the comparisons with baseline evaluation indicated that the scores did not differ significantly by age or sex of patient. Only three eligible records were available for one resident. The postintervention audit was performed approximately one or two years after the baseline audit, in the spring of 1985 for the residents who were in PGY-3 at the beginning of the study and in the spring of 1986 for the residents who were in PGY-2 at the beginning of the study. Because feedback to the latter group extended through early 1986, postintervention audit for both PGY groups occurred within two months of cessation of intervention.

The residents' performances before and after intervention were compared using a paired *t*-test. The baseline records for the two residents who left the program were not included in this part of the analysis.

Results

There were no baseline differences between amount or type of occupational information obtained by the primary care and nonprimary care internal medicine residents. Nearly half of all the charts in the baseline audit had no indication of employment status recorded by any health care provider. The overall mean for occupational information for the charts sampled was 1.3 pieces of information. There were no significant differences in the information recorded based on the patient's sex, race, or age (over 65 versus under 65) of patient, although there was a nonsignificant trend for men patients to have more occupational information recorded than the women (1.46 pieces of information versus 1.3).

Seventy-one charts were evaluated for postintervention comparison (30 men and 41 women patients). Again, there was a nonsignificant trend of higher scores on occupational information for the men than women (1.30 versus 1.07). The charts of the seven white patients in this group received lower scores for occupational information than the charts of the 55 black patients (0.42 versus 1.38, $.05 > p > .025$). (The remaining patients were Asian, Hispanic, or not specified in the record.) The charts of the 13 patients over age 65 had lower scores than those under

65 (0.76 versus 1.26), but this difference was not significant. The intervention and control groups of students had patients of approximately similar age, sex, and race. The overall score for occupational information for the intervention group improved insignificantly (1.25 to 1.44). However, the score for the control group declined significantly (1.38 to 0.92, $.05 > p > .025$) (Figure 1).

Employment status (that is, employed or not employed) was recorded for 79 (52 percent) of the 151 charts evaluated in the study (both baseline and postintervention, including baseline charts for the two residents who left the program). Overall, the same amount of information was reported for employed and unemployed patients.

Discussion

The internal medicine residents in the study recorded little or no occupational information in their assessment of ambulatory patients. There were no baseline differences in recording occupational information between the residents in primary care internal medicine and those in regular internal medicine. It was remarkable to the authors that performance deteriorated in the control group, although this finding is consistent with studies (6, 7) that have shown that defects in trainees' interviewing skills fail to improve over the course of clinical training. These defects include failure to ascertain the patient's emotional response to illness and failure to obtain adequate social (including occupational) histories, both of which reflect a depersonalization of the patient. It has been suggested (7, 8) that the interview process be restructured so that the physician obtains an understanding of the patient's life-style and current concerns prior to obtaining the history of present illness.

Deterioration in obtaining occupational information appears to have been prevented in the present sample by the intervention, although significant improvement of the unsatisfactory baseline performance was not demonstrated. It is possible that other differences in primary care training or in the attitudes of residents interested in ambulatory care prevented deterioration of performance in this group, although at baseline there were no differences between residents in the two groups. At baseline both the primary care and regular internal medicine PGY-2 residents tended to do slightly better than the PGY-3 residents.

A number of factors may have prevented the demonstration of a significant improvement in scores with intervention. First, by crediting all information obtained in the patient record by any health care provider, the scoring system minimized the effect of changes in any individual's performance and produced a bias toward nonsignificant differences. Second, the sample size was quite small, lessening the likelihood that differences found would be statistically significant. On the other hand, although chart audit intervention appears to have at least succeeded in maintaining performance, it may have done so simply because the primary care residents were aware of the audit by virtue of repeated feedback rather than because the intervention increased the residents' motivation.

Cope and colleagues (8) reported success in improving patient satisfaction with physicians by pointing out areas of deficiencies to the individual resident and providing individual counseling. Limitations of applying Cope's method of feedback to occupational health are the lack of general internal medicine faculty members with training in occupational history-taking and a misperception among the majority of the other faculty members that occupational health represents a nar-

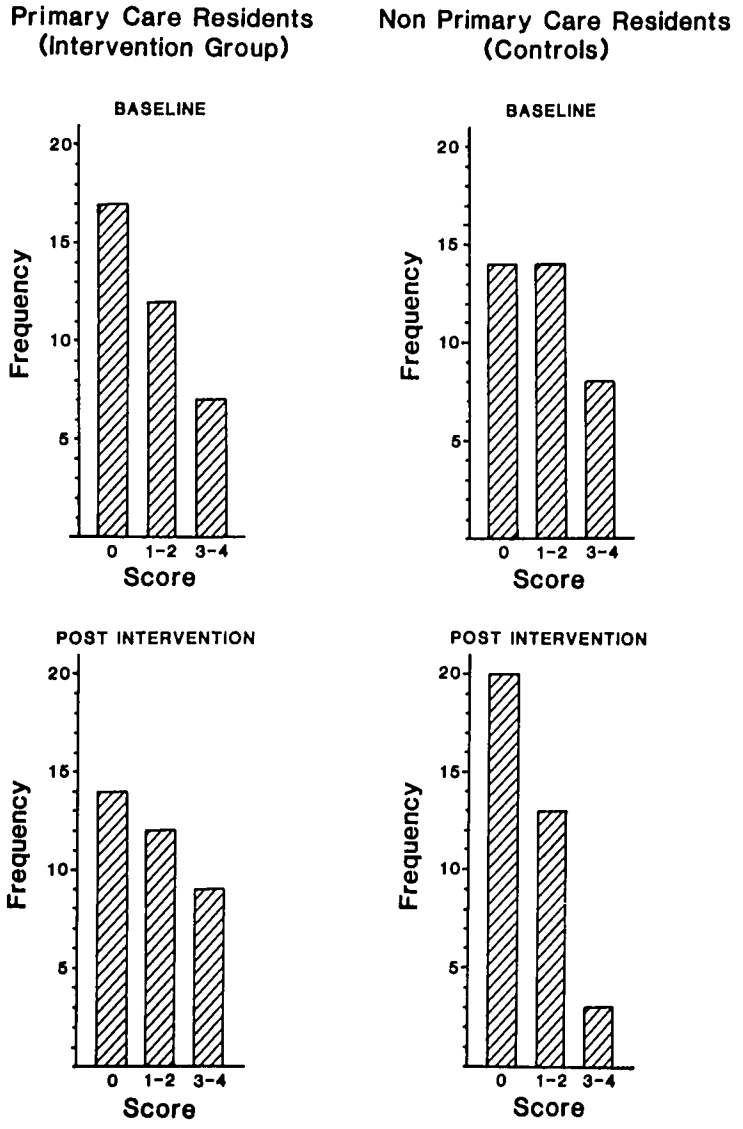

FIGURE 1

Numbers of charts in baseline and postintervention audits for occupational information scored as low (no information), medium (1–2 pieces of information), and high (3–4 pieces of information) for 10 regular internal medicine residents (the control group) and 10 primary care internal medicine residents (who received chart audits and feedback on recording occupational medicine), Hospital of the University of Pennsylvania, 1984–1985.

row subspecialty or that occupational information is unnecessary psychosocial data to be discarded as the resident matures and gains experience in writing up a history. In the course of Cope's study, medical students' write-ups were encountered in a number of the charts audited. These write-ups were more detailed and

thorough than the residents' write-ups, and they invariably contained more useful occupational information. A separate study being conducted by two of the authors (S.D., L.O.) has revealed that medical students' write-ups can be characterized as having more humanistic qualities than residents' write-ups. The deterioration of performance with level of training raises the concern that medical training, in some ways, has a negative effect on residents' development of interviewing skills in general and occupational history-taking in particular.

In his studies of the interviewing process, Platt (9) concluded that "as physicians mature through residency training they tend to listen less and less well, as if a major, if unwitting, function of our internal medicine residencies may be to train physicians so they can be perceived as cold and non-supportive." This deterioration in ability to communicate is perceived by residents themselves (10). A similar decline in the importance attributed to occupational health occurs in that faculty members consider it less important than house staff members, who in turn rate it as less important than do students (11).

Occupational history-taking provides not only useful information regarding adverse health exposures but also insight into how treatment for nonoccupational conditions will fit into the patient's lifestyle. Furthermore, inquiry into current, past, or future work helps to establish an adult, respectful relationship between patient and physician and may serve as a first step in eliciting concerns about health and functional ability.

Other methods which might improve the recording of the occupational history should also be investigated. These could include:

1. Structured interventions such as self-completed patient histories or prompts located within the charts themselves.
2. The development of problem-oriented learning tools that require active participation by the residents.
3. Faculty development programs aimed at those who teach internal medicine.

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