Physicians' Decisions to Prescribe Benzodiazepines for Nervousness and Insomnia

Richard L. Brown, MD, MPH, Roger L. Brown, PhD, Laura A. Saunders, MSSW, Carrie A. Castelaz, BS, Orestis Papasouliotis, MS

OBJECTIVE: To assess the effects of particular clinical cues on decisions about prescribing benzodiazepines.

DESIGN: A factorial survey based on social judgment theory.

SETTING: A midwestern U.S. medical school.

PARTICIPANTS: Physicians ($n = 115$) recruited from the staff by invitation and interview.

MEASUREMENTS AND MAIN RESULTS: Physicians indicated their level of agreement with prescribing a benzodiazepine for 24 hypothetical cases of nervousness and insomnia. The cases stemmed from the same scenario but varied systematically with regard to psychiatric diagnosis, recent ability to work, and long-term social stability. A fourth cue, called "health status," covertly depicted the presence or absence of three common alcohol-related medical problems. One fourth of the physicians agreed with prescribing for 15 or more cases, and 15% disagreed for all of them. Agreement was cumulative and least common for major depression, more common for adjustment disorder, and most common for generalized anxiety. Agreement with prescribing for cases with alcohol-related medical problems was 14% less than that for cases without them. Over half the physicians agreed with prescribing for 4 or more of the 12 cases with alcohol-related medical problems.

CONCLUSIONS: Prescribing decisions varied widely. Some physicians avoided benzodiazepines unnecessarily for some cases, while others agreed with prescribing for patients with a high probability of alcohol abuse. Blanket calls for more or less prescribing are overly simplistic; physicians should be able to recognize substance use disorders among anxious patients and make prescribing decisions based on relevant literature and clinical cues.

KEY WORDS: benzodiazepines; physicians' practice patterns; anxiety disorders; depression; alcoholism.

J GEN INTERN MED 1997;12:44-52.

The medical literature provides incomplete guidance on decisions to prescribe benzodiazepines as anxiolytics and soporifics. Some clinicians and regulators decry the overuse of benzodiazepines, citing the volume of benzodiazepine prescriptions, the prevalence of benzodi-

azepine abuse and dependence in substance abuse treatment populations,¹ and the potential for drug diversion, substance abuse, substance dependence, cognitive dysfunction, oversedation, and injuries. Others lament excessive regulatory oversight, exaggerated reports of adverse effects, and patients who suffer unnecessarily from readily treatable disorders.²⁻⁵ Limited data from controlled, prospective studies are available to resolve the controversy.²

In the face of such controversy, it would be useful to understand how physicians decide to prescribe benzodiazepines, particularly physicians who model prescribing behaviors to trainees. Because symptoms, such as nervousness and insomnia, that may be treated with benzodiazepines can arise from substance abuse or dependence, it would be useful to determine whether physicians might prescribe benzodiazepines for patients with many signs and symptoms of these disorders.

This study used a factorial survey design based on social judgment theory,⁶ as have other studies on medical decision making,⁷⁻¹⁰ to assess the effect of particular clinical cues on prescribing decisions by a medical faculty. Four factors were varied in the cases to test particular hypotheses: psychiatric diagnosis, recent functional status, long-term social stability, and the presence or absence of a triad of medical disorders that are commonly associated with alcohol abuse. Prescribing was expected to be more frequent for generalized anxiety disorder than for adjustment disorder and major depressive disorder, more frequent for patients who exhibited severe rather than minimal dysfunction related to their psychiatric disorder, more frequent for patients who exhibited long-term social stability rather than instability, and less frequent for patients who exhibited medical disorders that suggested alcohol abuse.

METHODS

Subjects

We identified 226 prospective subjects from the medical staff directory of a midwestern U.S. medical school. Members of the sections of allergy, cardiology, endocrinology, gastroenterology, general internal medicine, hematology, infectious disease, nephrology, oncology, pulmonology, and rheumatology, and members of the departments of family medicine, neurology, psychiatry and rehabilitation medicine were invited to participate. Surgical specialists were not included because they responded in low numbers to a previous questionnaire study.⁷ Initial recruitment consisted of at least two written invitations to schedule interviews. Prospective subjects were told that the study's pur-

Received from the Department of Family Medicine, University of Wisconsin-Madison Medical School.

Supported by the Research Division, Department of Family Medicine, University of Wisconsin-Madison Medical School.

Address correspondence and reprint requests to Dr. Brown: 777 South Mills St., Madison, WI 53715.

pose was to examine their clinical decisions in an area of some controversy; the exact focus of the study was not revealed. Nonresponders were sent a written form of the survey. One hundred and two subjects completed structured interviews, and 13 returned identically structured written questionnaires. Prescribing judgments did not differ between subjects who completed interviews and subjects who completed written questionnaires.

Measures

The subjects were presented with 24 cases that share the same basic scenario:

A 43-year-old man with a history of hypertension comes to see his regular physician for nervousness and inability to fall asleep. The patient saw this physician three weeks ago for similar symptoms. The physician found that the patient was under increased stress at work. He was working as an independent insurance agent, and business had been very slow. He was feeling very pressured to increase his sales. His blood pressure at that visit was 150/95. A physical exam revealed no other abnormalities. The physician ordered some blood work, prescribed alprazolam 0.5 mg tid prn, 40 tablets, no refills, and referred the patient for psychological assessment and treatment. The patient reports today that the psychologist was not helpful, and he refuses additional counseling. He states that the medication was very helpful, and he requests more. The patient has been married for sixteen years and has three children. He smokes one pack of cigarettes per day despite previous advice by his physician to quit. He states that he drinks only 'socially.' He takes enalapril 10 mg daily for his blood pressure. He takes no other medications or drugs. He denies suicidal ideation. His blood pressure today is 140/95.

The 24 cases varied systematically with regard to four cues—psychiatric diagnosis, health status, long-term stability of job and marriage, and short term ability to work—such that each case represented a unique combination of the cues:

- ◆ Each patient was reported to have a diagnosis of either generalized anxiety disorder, adjustment disorder, or major depressive episode. The subjects were given a brief written synopsis of the DSM-III-R criteria for these disorders.
- ◆ Each patient was reported to have either “a stable job and marriage” or “an unstable job and marriage.” “A stable job and marriage” was defined as “the patient’s business has done well over the years, and his marriage has been stable.” “An unstable job and marriage” was defined as “the patient’s business has had many ups and downs; he is separated for the second time and anticipates divorce.”
- ◆ Each patient was described as being “able to work” despite his symptoms, or “unable to work” (“seriously impeded [in] his ability over the past week to meet with clients and complete paperwork”).
- ◆ Each patient was described as having either “stable health” or “health problems.” “Stable health” was de-

defined as “hypertension usually well controlled” and normal results from blood tests performed 3 weeks ago. “Health problems” were defined as “labile blood pressure, mildly elevated gamma-glutamyl transferase and aspartate aminotransferase (AST or SGOT), and intermittent epigastric pain and esophageal reflux that respond to H2 blockers.” These conditions were chosen because they are commonly linked to alcohol abuse.^{11,12} The presence of these conditions plus the complaints of nervousness and insomnia would be highly suggestive of alcohol abuse. Thus the health status cue covertly depicted a lower versus higher likelihood of alcohol abuse.

For the subjects who were interviewed, each case was presented on a separate card, and the cards were shuffled before each interview. For the subjects who responded by questionnaire, the cases appeared in different random orders as generated by a computer program. For each case, the subjects were asked to indicate the extent to which they would agree or disagree with continued prescribing of alprazolam or another benzodiazepine by the patient’s regular physician. They did so using an integer scale of −5 (strongly disagree) to +5 (strongly agree). Zero was omitted from the scale to force a decision.

To assess test-retest reliability, 3 of the first 12 cases for each subject were randomly selected to be readministered as the last 3 of a total of 27 cases. The correlation between the responses of the 345 pairs of repeated cases was 0.75. In 308 (89%) of the pairs, the subjects’ categorical decisions to prescribe were in accord.

The subjects also responded to questions on demographics, training, clinical activity, and clinical interest.

Analysis

Physicians’ decisions to provide or not provide benzodiazepines were analyzed using factorial survey methods.^{7,13} These methods provide for the application of experimental design to survey research. They are used primarily to study participant responses to hypothetical situations such as manipulated case vignettes. A single-level analysis^{14,15} and a separate-level, two-stage analysis^{16,17} were considered but rejected because their assumptions are violated by factorial survey designs.¹³ Instead, a hierarchical linear modeling approach was used. This model poses two regression models simultaneously, one modeling the vignette effects within the respondents, and one modeling the respondent effects between respondents. This approach allows the partitioning of the total dispersion in the estimated regression parameters into sampling variance and a residual variance. Thus, the hierarchical approach simultaneously uses specific respondent information together with information from all other respondents at the same time to arrive at more accurate estimates of parameters than do other methods.^{13,18}

For this study, we used the equation convention sug-

gested by Rabash, Prosser, and Goldstein.¹⁸ The hierarchical model was specified in two sets of equations, one within groups and one between groups. Because our outcome measure of prescribing versus not prescribing benzodiazepines was dichotomous, the data were analyzed with a logit model.¹⁹ The logistic regression approach modeled information about the vignettes and the physicians simultaneously.

The structure of the model was as follows: y_{ij} denoted the value of the response variable (0 represented disagreement with prescribing, 1 represented agreement) for the i th vignette for the j th physician. The fixed part of the model was denoted by f_{ij} . In this analysis, fixed variables were considered at all levels. Because the model had two levels, random variables were denoted at the physician level (r_j).

With π_{ij} representing the probability of prescribing benzodiazepines, the two-level logistic model was defined as

$$\text{logit } \pi_{ij} \equiv \ln \left(\frac{\pi_{ij}}{1 - \pi_{ij}} \right) = f_{ij} + r_j, \quad (1)$$

where f_{ij} represents vignette conditions and physician characteristics, and r_j represents the random terms per vignette condition. This can also be written

$$\pi_{ij} = \frac{\exp(f_{ij} + r_j)}{1 + \exp(f_{ij} + r_j)}. \quad (2)$$

The full model was written as

$$y_{ij} = \pi_{ij} + e_{ij} = \frac{\exp(f_{ij} + r_j)}{1 + \exp(f_{ij} + r_j)} + e_{ij}, \quad (3)$$

where e_{ij} was the overall model residual term.

The four vignette conditions of psychiatric diagnosis, alcohol-related medical problems (ARMPs), recent ability to work, and long-term social stability were initially modeled as five variables (two dummy variables for diagnosis), plus two variables representing the interaction between ARMPs and diagnosis. For the dummy variables, generalized anxiety was used as the reference condition. The physician-level variables that were modeled were year of medical school graduation, physician gender, percentage of time in patient care, specialty, particular interest in psychiatry (assumed to be present for psychiatrists), and particular interest in substance abuse. Three categories of specialties were indicated by two dummy variables—internal medicine and psychiatry—with family medicine serving as the reference condition.

Each of the vignette conditions was initially modeled as random across physicians. Subsequently, vignette variability was modeled as a function of physician interest in substance abuse. This nested model consisted of two parameters per vignette condition, one for interest in substance abuse and a constant. In an attempt to explain vignette condition variability across physicians, this model was extended by simultaneously modeling the slopes of the vignette conditions. Only the physician characteristic of interest in substance abuse was used to predict the variability in the vignette conditions across physicians.

The primary results were obtained as estimated parameters and standard errors of these estimates for fixed effects and random effects of the physician-level and vignette-level variables. However, for this report, estimated odds ratios, along with confidence intervals, were used to indicate the effects of these variables on prescribing decisions. For further details regarding the analytic methods, see Brown et al.⁷

In the standard formulation of model 3, the e_{ij} are assumed to have a binomial distribution. However, it has been shown that this distribution can display variation less than 1.0.^{20,21} This so-called extra-binomial distribution was also tested. If an extra-binomial term is discovered, then one can conclude that there are other vignette-level explanatory variables within physicians. This study used the MLn program by Rabash, Prosser, and Goldstein to obtain the estimates.²²

For the analysis of a cumulative diagnosis-related scale of prescribing decisions, standard Guttman scaling techniques were followed.²³ A coefficient of reproducibility higher than 0.9 and a coefficient of scalability greater than 0.7 were taken to indicate a valid, unidimensional, cumulative scale.

RESULTS

Of the 226 physicians recruited, 115 (51%) participated. The specialty breakdown of the participants is shown in Table 1. The physicians graduated from medical school between 1949 and 1990 (mean 1976). Twenty-one (18%) of the participants were women. The physicians reported spending an average of 50% of their professional time in patient care, with a range of 10% to 95%. One fourth of the subjects who were not psychiatrists reported a special interest in psychiatry.

Of the 111 nonparticipating physicians, 13 (12%) were women. The gender breakdown was similar between the participants and nonparticipants (χ^2 , $p > .1$). Year of medical school graduation was available for 90 of the 111 nonparticipants. The average year of graduation was 1968. The participants graduated more recently than the nonparticipants (Student's t test, $p < .05$).

Figure 1 shows the distribution of the total number of the 24 cases for which the physicians agreed with prescribing a benzodiazepine. The distribution ranged from 0 to 24 cases, with a median of 9, a mean of 9.3, and a standard deviation of 6.3. The 25th percentile was 4 cases; the 75th percentile was 15 cases. Nearly 15% of the subjects disagreed with prescribing for all 24 cases.

Table 2 shows the proportion of physicians who agreed with prescribing a benzodiazepine for each of the cases. It is evident that prescribing varied substantially by diagnosis, with the highest number prescribing for generalized anxiety disorder, fewer for adjustment disorder, and fewest for major depressive episode.

Table 3 shows that prescribing by diagnosis occurred

Table 1. Specialty Distribution of Participants and Specialty-Specific Participation Rates

Specialty	Number of Specialists Who Participated	Number of Specialists Who Were Recruited	Percentage of Participation
Allergy	2	5	40
Cardiology	7	24	29
Endocrinology	7	16	44
Family practice	20	25	80
Gastroenterology	5	13	38
General internal medicine	13	30	43
Hematology	3	11	27
Infectious disease	4	9	44
Nephrology	3	11	27
Neurology	9	13	69
Oncology	11	18	61
Psychiatry	15	22	68
Pulmonology	7	15	46
Rehabilitation medicine	3	5	60
Rheumatology	6	9	66
Total	115	226	51

largely in a stepwise, cumulative pattern. With three possible diagnoses, there was a total of 2^3 , or 8, combinations of diagnoses for which the physicians could have agreed with prescribing for at least one case. All but 3.5% of the physicians exhibited agreement with four of the eight possible combinations of diagnoses: none; generalized anxiety disorder only; generalized anxiety disorder and adjustment disorder; or all three psychiatric diagnoses. One of the physicians agreed with prescribing only for adjustment disorder, and one agreed with prescribing only for a major depressive episode. Every physician who agreed with prescribing for adjustment disorder and major depressive disorder also agreed with prescribing for generalized anxiety disorder. The coefficient of reproducibility was 0.977, and the coefficient of scalability was 0.912, suggesting a highly valid Guttman scale.²³

Figure 2 allows a closer look at prescribing by the presence or absence of ARMPs. From 60% to 67% of sub-

jects agreed with prescribing a benzodiazepine for each case of generalized anxiety disorder without ARMPs, and 51% to 57% agreed for each case of generalized anxiety disorder with ARMPs. For the cases of adjustment disorder, the corresponding figures were 47% to 50%, and 36% to 42%; for major depressive disorder, 12% to 16%, and 12% to 13%.

More than three fourths (77%) of the subjects agreed with prescribing a benzodiazepine for at least one case with ARMPs, 55% agreed for four or more cases, and 26% agreed for eight or more such cases. The subjects agreed with prescribing for 497 (36.0%) of the 1,380 total cases with ARMPs administered across all subjects (12 cases per subject $\times$ 115 subjects = 1,380 cases), and for 578 (41.9%) of the 1,380 cases without ARMPs. With agreement for the cases without ARMPs considered as a reference point, the presence of ARMPs reduced agreement with prescribing by 14.0%.

FIGURE 1. Frequency distribution of the number of cases for which the physicians agreed with continued prescription of benzodiazepines.

Table 2. Proportion of Subjects Who Agreed with Prescribing for at Least One Case of Each Diagnosis, by Groupings of Diagnoses

Groupings of Diagnoses*	Percentage Who Agreed with Prescribing for at Least One Case of Each Diagnosis
Common groupings	
None	14.8
GAD only	13.9
GAD + ADJ only	39.1
GAD + ADJ + MDE	28.7
Subtotal	96.5
Uncommon groupings	
MDE only	0.9
ADJ only	0.9
MDE + ADJ only	0.0
GAD + MDE only	1.7
Subtotal	3.5

*GAD indicates generalized anxiety disorder; ADJ, adjustment disorder; MDE, major depressive episode.

Figure 2 allows the opportunity to visualize the possible effects of the other vignette variables on prescribing. To assess the effect of long-term social stability on prescribing decisions, compare the heights of the bars in columns 1 versus 3, 2 versus 4, 5 versus 7, and 6 versus 8. To assess the effect of recent ability to work, compare the heights of the bars in columns 1 versus 2, 3 versus 4, 5 versus 6, and 7 versus 8. Visually, it is difficult to detect consistent

effects of long-term social stability and recent function on prescribing decisions across the three diagnoses.

The results of the multilevel logistic regression model are presented in Table 3. The results of the start model indicated that only the vignette condition of diagnosis and ARMPs were significant predictors of benzodiazepine prescribing decisions. The interaction effects of diagnoses and ARMPs were not considered significant predictors. Furthermore, the vignette conditions of diagnosis and ARMPs varied significantly across physicians in predicting prescribing decisions. The variability could not be attributed to any physician-level variables, including specialty. Grouping general internists with family physicians rather than internal medicine subspecialties produced the same results.

The model was reduced to the most parsimonious structure, which is shown in Table 3 as the "Final Model." This reduction improved the overall fit of the model in reducing the likelihood of the start model from $-2 \times \log(\text{lh}) = 3,142.36$ to $-2 \times \log(\text{lh}) = 3,004.54$ with $df = 19$, $p < .05$, with the final model explaining approximately 67% of the variability in physician prescribing. The extra-binomial variance, estimated at 0.0636, $SE = 0.0021$, $p < .05$, was lower than a binomial model would imply. This low extra-binomial variance suggests that there was a source of variation at the vignette level that was not incorporated in the model.

For the vignettes studied, only three conditions had significant overall influence on physicians' prescribing decisions. Physicians agreed with prescribing significantly less frequently for patients with, rather than without,

Table 3. Results of the Hierarchical Linear Models for Benzodiazepine Prescribing Decisions

Variables	Start Model		Final Model	
	Estimated Odds Ratio	95% Confidence Interval	Estimated Odds Ratio	95% Confidence Interval
Physician-level variables				
Year of graduation	0.998	0.960–1.03		
Time in patient care	1.003	0.988–1.019		
Gender	0.940	0.359–2.456		
Interest in substance abuse	1.420	0.538–3.747		
Interest in psychiatry	2.295	0.941–5.600		
Internist*	0.600	0.237–1.520		
Psychiatrist*	8.872	0.665–118.2		
Vignette-level variables†				
MDE‡§	0.090	0.050–0.161	0.087	0.053–0.143
ADJ‡§	0.500	0.355–0.703	0.526	0.396–0.698
Long-term social stability	1.291	0.581–2.868		
Recent function	1.069	0.846–1.349		
ARMP§	1.352	1.053–1.74	1.369	1.13–1.67
ARMP × MDE	0.866	0.574–1.31		
ARMP × ADJ	1.043	0.758–1.435		

*Family physician served as the reference condition for this dummy variable.

†MDE indicates major depressive episode; ADJ, adjustment disorder; ARMP, alcohol-related medical problem.

‡Generalized anxiety disorder served as the reference condition for this dummy variable.

§ $p < .05$.

FIGURE 2. Percentage of subjects who agreed with continued prescription of benzodiazepines for each case. ADJ indicates adjustment disorder; ARMPs, alcohol-related medical problems; GAD, generalized anxiety disorder; MDE, major depressive disorder. For ARMPs, "+" indicates "present," and "-" indicates "absent." For social stability, "+" indicates "stable job and marriage," and "-" indicates "unstable job and marriage." For recent function, "+" indicates "able to work despite symptoms," and "-" indicates "unable to work."

ARMPs, and less frequently for patients with major depressive episode and adjustment disorder, as compared with patients with generalized anxiety disorder.

The model estimated the variability in the probability of prescribing at 2.820 (SE = 0.4226, $p < .05$), indicating significant variability in prescribing decisions across the study. Other significant random effects terms of the model indicate that significant variability occurred with regard to all of the vignette conditions. This indicates that the physicians varied among themselves in the importance they attributed to each vignette condition, but only the vignette conditions of ARMPs and psychiatric diagnoses were influential enough to affect decision making for the physicians as a group. It was also noted that the ARMPs-adjustment disorder interaction in the vignette had a marginally significant effect on the variability in physicians' decisions to prescribe.

DISCUSSION

This study showed extensive differences in prescribing decisions among the subjects. The variety was manifested in the wide distribution of total numbers of cases for which the subjects agreed with prescribing, ranging from none to all of the cases.

Psychiatric diagnosis was a major determinant of prescribing decisions; agreement with prescribing was most common for generalized anxiety, slightly less common for adjustment disorder, and least common for a major depressive episode. In addition, prescribing decisions were cumulative and stepped, in the same order.

The presence of several ARMPs significantly blunted agreement with prescribing, but only by 14%. Agreement with prescribing was common despite the presence of ARMPs, with more than three fourths of the subjects agreeing with prescribing for at least one case with ARMPs and more than half agreeing for at least four cases. Other clinical cues such as the patient's long-term

social stability and current ability to function had little effect on physicians' prescribing decisions.

To investigate physicians' decisions to prescribe benzodiazepines, this study invoked a decision analytic technique that carries some strengths and limitations. The major strength of the technique is the ability to assess decisions for identical cases across many subjects and to vary or hold constant particular clinical cues.

Two potential limitations of the technique are the artificiality and the narrow spectrum of the clinical scenarios. One cannot know whether the physicians would have responded differently had patients seen them in actual practice settings. Further, it is unclear whether the physicians would have responded differently had the questionnaires portrayed patients of different ages, genders, occupations, and other demographic attributes.

One also cannot know the extent to which social desirability influenced the subjects' responses. In this study, there may have been at least two competing perceptions of social desirability. One might have been the desirability of not initiating a drug problem by prescribing a benzodiazepine. Another might have been the desirability of avoiding undertreatment of psychiatric disorders. It cannot be determined which of these or other perceptions regarding social desirability might have affected the subjects' responses.

It would clearly be preferable if clinical decision making could be studied rigorously in vivo. One way to do so would be to send standardized, simulated patients to physicians' offices, though the costs would be great. A retrospective analysis of clinical behavior would undoubtedly be impeded by difficulty in identifying cases in important clinical subpopulations that are sufficiently similar across the physicians' practices.⁸

Another potential limitation of the study concerns the sampling. The participants were trained more recently than the nonparticipants. Although the year of medical graduation was not found to be significantly associated with prescribing decisions, it is possible that the nonparticipants

would have responded differently than the participants. Generalizability may also be a limitation. It is unknown whether other groups of medical faculties or community physicians would have responded as did the participants.

The model explained a substantial amount of the overall variability and the variability in prescribing decisions across the patients. The low extra-binomial variance suggested that there were other, unmeasured, vignette-level variables that varied among the vignettes within physicians and were associated with the probability of prescribing. It is possible, for example, that the card shuffling did not result in random sequences of cases, and that the sequence affected prescribing decisions. The lack of explanation for much of the variance in prescribing decisions may have resulted from a lack of reliability, from possible interactions between variables and a lack of linearity that could not be assessed, and from the lack of measures of other factors that may be responsible for differences in decision making.

Even if the case sequences had been random, there might be other explanations for the imperfect test-retest reliability. The subjects may have learned and modified their decision policies as they gained experience in responding to the scenarios. Fatigue and time pressure may also have hindered their concentration on later scenarios. Although the correlation between numerical responses to the repeated scenarios was only 0.75, the concordance among categorical decisions to prescribe was 89%. Some confidence can be taken from the use of categorical decisions, rather than the numerical ratings, as the dependent variable.

It is interesting to compare the subjects' prescribing decisions with empirical data and published opinion on prescribing benzodiazepines. As a group, the subjects reflected that generalized anxiety disorder is a well-accepted indication for benzodiazepine use,^{2,24} that benzodiazepines are commonly prescribed for adjustment disorder despite the lack of studies on this indication,^{25,26} and that the role of benzodiazepines in the treatment of depression is limited.²⁴ Although long-term prescribing of benzodiazepines is not uncommon,^{27,28} data are sparse on the use of benzodiazepines for more than 1 month. Thus, the current study addresses an aspect of medical decision making that is informed by little data.

In this study, the subjects often agreed with prescribing benzodiazepines for nervousness and insomnia that could have resulted from alcohol abuse. The possibility that physicians are frequently prescribing benzodiazepines for patients with alcohol abuse is of concern, as such patients could be subjected to risk of polysubstance abuse and dependence. In actual practice, prescribing benzodiazepines for symptoms of substance use disorders may be common, because: substance use disorders are common among patients in general medical and mental health settings²⁹⁻³⁴; anxiety, agitation, panic, insomnia, and dysphoria are common symptoms of substance use

disorders; substance use disorders and other psychiatric disorders (dual diagnoses) commonly coexist³⁴⁻³⁷; and because physicians often do not recognize patients with substance use disorders.^{32,38,39} Although the prevalence of "nonmedical use" of benzodiazepines is low,⁴⁰ this statistic does not reflect patients who may be taking benzodiazepines as prescribed unwittingly for relief of symptoms caused by the abuse of, or dependence on, other substances. Experts recommend that patients who may have dual diagnoses—a substance use disorder and another psychiatric disorder—avoid substance use for at least several weeks, if possible, before decisions are made regarding psychotropic medications, as psychiatric symptoms will often abate with abstinence.⁴¹⁻⁴³ Thus, physicians who would prescribe benzodiazepines should be able and willing to assess patients for substance use disorders. A previous study suggests that physicians often do not do so.⁴⁴

An initial hypothesis was that there would be more agreement with prescribing for patients who were unable to work because of their symptoms. Actually, recent function was not associated with prescribing decisions. This is a surprising finding, as greater dysfunction often indicates a disorder of more severity and greater need for treatment.¹ There are at least a few possible explanations for this finding. One is that the subjects do not believe that benzodiazepines can restore function for patients who are debilitated by feelings of nervousness and insomnia. Another is that the subjects believe that less-functional patients are at higher risk of substance use disorders and suicide by overdose. A third possible explanation is that the subjects are not sympathetic to patients who allow stress and fatigue to interfere with their work, perhaps because physicians are socialized to the opposite.

An initial hypothesis was that there would be more prescribing for patients with long-term social stability. The rationale for this hypothesis was that stability in job and marriage would be interpreted to indicate less risk that benzodiazepines would be used for a suicide attempt or otherwise abused. This hypothesis was not supported by the data.

A minority of the physicians (14.8%) did not agree with prescribing for any of the cases. For at least one case, with generalized anxiety, no ARMPs, long-term social stability, and recent inability to work, it is difficult to rationalize why benzodiazepines should not be prescribed. The term "opiophobia" has been used to describe physicians' apparent reluctance to prescribe opioids for pain.⁴⁵ This study provides some evidence for "benzophobia." Some of the physicians who did not prescribe benzodiazepines stated to the interviewer that they would automatically refer the patient to a psychiatrist. In an ideal world, this decision policy might provide for adequate care for most patients who would benefit from benzodiazepines. However, stigma and restricted access often hinder patients' receipt of specialized mental health

care.⁴⁶ Thus, some patients who might benefit from benzodiazepines may not receive them unless they are prescribed by nonpsychiatrist physicians.

The foregoing attempts to explain the physicians' prescribing patterns must be regarded as speculative. Such explanations would serve well as hypotheses for a subsequent study that questions the subjects about the rationale for their responses.

In summary, this study suggests that physicians vary substantially in their perceptions of the indications for benzodiazepines. For the three diagnoses assessed, agreement with prescribing was strongest for generalized anxiety disorder, less strong for adjustment disorder, and weakest for major depressive episode, though there was substantial divergence of opinion for each diagnosis. One may not have expected unanimity among the subjects, as guidelines on prescribing benzodiazepines, and the empirical data to support such guidelines, are lacking. However, many of the subjects' prescribing decisions contradicted recommendations that are supported by published studies or accepted by most authors. Specifically, some of the physicians would apparently avoid benzodiazepines altogether for generalized anxiety disorder; some would apparently avoid benzodiazepines for the dysfunctional patient with generalized anxiety disorder who might benefit most; and many might prescribe benzodiazepines unwittingly to patients with active alcohol problems.

Further research is needed to identify the individuals for whom benzodiazepines would be safe and effective, particularly over the long term. Until such research is completed, blanket suggestions that physicians either curtail or liberalize their prescribing of benzodiazepines miss the mark. For some groups of patients, some physicians should prescribe more cautiously; for other patients, some physicians should prescribe more liberally. As for other clinical decisions, physicians should be encouraged to weigh the relevant clinical cues and base prescribing decisions on the available data and recommendations by experts.

REFERENCES

- Jensen C, Cowley D, Walker R. Drug preferences of alcoholic poly-drug abusers with and without panic. *J Clin Psychiatry*. 1990;51:189-91.
- Shader RI, Greenblatt DJ. Use of benzodiazepines in anxiety disorders. *N Engl J Med*. 1993;328:1398-1405.
- Linden M, Gothe H. Benzodiazepine substitution in medical practice; analysis of pharmacoepidemiologic data based on expert interviews. *Pharmacopsychiatry*. 1993;26:107-13.
- Talley JH. But what if a patient gets hooked? Fallacies about long-term use of benzodiazepines. *Postgrad Med*. 1990;87:187-204.
- Rifkin A. Benzodiazepines for anxiety disorders. *Postgrad Med*. 1990;87(1):209-19.
- Brunswick E. *The Conceptual Framework of Psychology*. Chicago, Ill: University of Chicago Press, 1952.
- Brown RL, Brown RL, Edwards JA, Nutz JF. Variation in a medical faculty's decisions to transfuse: implications for modifying blood product utilization. *Med Care*. 1992;30:1083-6.
- Holmes MH, Rovner DR, Rother ML, et al. Methods of analyzing physician practice patterns in hypertension. *Med Care*. 1989;27:59-68.
- LaDuca A, Engel JD, Chovan JD. An exploratory study of physicians' clinical judgment; an application of social judgment theory. *Eval Health Prof*. 1988;11:178-99.
- Wigton RS. Applications of judgment analysis and cognitive feedback to medicine. In: Brehmer B, Joyce CRB, eds. *Human Judgment: The SJT View*. New York, NY: North-Holland/Elsevier Science Publishers; 1988:227.
- Goodwin DW. Alcohol: clinical aspects. In: Lowinson JH, Ruiz P, Millman RB, Langrod J, eds. *Substance Abuse: A Comprehensive Textbook*. Baltimore, Md: Williams and Wilkins; 1992:144-51.
- Sikkink J, Fleming M. Adverse health effects and medical complications of alcohol, nicotine, and drug use. In: Fleming MF, Barry KL. *Addictive Disorders*. St. Louis, Mo: Mosby-Year Book; 1992:145-68.
- Hox J, Kreft L, Hermkens P. The analysis of factorial surveys. *Soc Methods Res*. 1991;19(4):493-510.
- Rossi P, Anderson A. The factorial survey approach: an introduction. In: Rossi P, Nock S, eds. *Measuring Social Judgments*. Beverly Hills, Calif: Sage Publications; 1982.
- Shepelak N, Alwin D. Beliefs about inequality and perceptions of distributive justice. *Am Soc Rev*. 1985;51:30-46.
- Burstein L, Linn L, Capell F. Analyzing multilevel data in the presence of heterogeneous within-class regression. *J Educ Stat*. 1978;3:347-83.
- De Leeuw J, Kraft I. Random coefficient models for multilevel analysis. *J Educ Stat*. 1985;11:57-86.
- Rabash J, Prosser R, Goldstein H. *Data analysis with ML2*. London, UK: Institute of Education, University of London; 1990.
- Hosmer D, Lemeshow S. *Applied Logistic Regression*. New York, NY: John Wiley and Sons; 1989.
- Aitkin M, Anderson D, Francis B, Hinde J. *Statistical Modeling in Glim*. New York, NY: Oxford University Press; 1989.
- Goldstein H. Non-linear multilevel models, with application to discrete response data. *Biometrika*. 1991;78:45-51.
- Rabash J, Prosser R, Goldstein H. *Data Analysis with MLn*. London, UK: Institute of Education, University of London; 1995.
- Nie NH, Hull CH, Jenkins JG, Steinbrenner K, Bent DH. *SPSS*. 2nd ed. New York, NY: McGraw-Hill; 1975:528-39.
- Jonas JM, Cohon MS. A comparison of the safety and efficacy of alprazolam versus other agents in the treatment of anxiety, panic, and depression: a review of the literature. *J Clin Psychiatry*. 1993;54(10 suppl):25-45.
- Rickels K, Schweizer E. Anxiolytics: indications, benefits, and risks of short- and long-term benzodiazepine therapy: current research data. *NIDA Res Monogr*. 1993;131:51-67.
- Sussman N. How to manage anxious patients who are depressed. *J Clin Psychiatry*. 1993;54(5 suppl):8-16.
- Rodrigo E, King M, Williams P. Health of long term benzodiazepine users. *BMJ*. 1988;296:603-6.
- Simpson R, Power K, Wallace L, Butcher M, Swanson V, Simpson E. Controlled comparison of the characteristics of long-term benzodiazepine users in general practice. *Br J Gen Pract*. 1990;40: 22-6.
- Coulehan JL, Zettleer-Segal M, Block M, McClelland M, Schulberg HC. Recognition of alcoholism and substance abuse in primary care patients. *Arch Intern Med*. 1987;147:349-52.
- Cyr MG, Wartman SA. The effectiveness of routine screening questions in the detection of alcoholism. *JAMA*. 1988;259:51-4.
- McNaghy SE, Parker RM. High prevalence of recent cocaine use and the unreliability of patient self-report in an inner-city walk-in clinic. *JAMA*. 1992;267:1106-8.
- Moore RD, Bone LR, Geller G, Mamon JA, Stokes E, Levine D. Prevalence, detection, and treatment of alcoholism in hospitalized patients. *JAMA*. 1989;261:403-7.
- Weiser C, Schmidt L. Alcohol and drug problems among diverse health and social service populations. *Am J Public Health*. 1993; 83:824-9.

34. Speer DC, Bates K. Comorbid mental and substance disorders among older psychiatric patients. *J Am Geriatr Soc.* 1992;40:886-90.
35. Helzer JE, Pryzbeck TR. The co-occurrence of alcoholism with other psychiatric disorders in the general population and its impact on treatment. *J Stud Alcohol.* 1988;49:219-24.
36. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Arch Gen Psychiatry.* 1994;51:8-19.
37. Kiesler CA, Simpkins CG, Morton TL. Prevalence of dual diagnoses of mental and substance abuse disorders in general hospitals. *Hosp Commun Psychiatry.* 1991;42:400-3.
38. Moore RD, Malitz FE. Underdiagnosis of alcoholism by resident in an ambulatory medical practice. *J Med Educ.* 1986;61:46-52.
39. Brown RL, Carter WB, Gordon MJ. Diagnosis of alcoholism in a simulated patient encounter by primary care physicians. *J Family Pract.* 1987;25:259-64.
40. National Household Survey on Drug Abuse: Main Findings 1991. Rockville, Md: Substance Abuse and Mental Health Administration; 1993. Dept. of Health and Human Services publication (SMA) 93-1980.
41. Frances RJ, Borg L. The treatment of anxiety in patients with alcoholism. *Clin J Psychiatry.* 1993;54(5 suppl):37-43.
42. Burant D, Liepman MR, Miller MM. Mental health disorders and their impact on treatment of addictions. In: Fleming MF, Barry KL, eds. *Addictive Disorders.* St. Louis, Mo: Mosby-Year Book; 1992; 315-37.
43. Turnbull JM, Roszell DK. Dual diagnosis. In: Blondell RD, ed. *Primary Care.* Philadelphia, Pa: W B Saunders; 1993;20:189.
44. Schwartz R, Johnson N, Hornung C, Phelps G, Berg E. Awareness of substance abuse in orthopedic patients: a survey of orthopedic surgeons. *South Med J.* 1991;84:1455-7.
45. Morgan J. American opiophobia: customary underutilization of opioid analgesics. In: Hill CS, Fields WS, eds. *Advances in Pain Research and Therapy.* New York, NY: Raven Press; 1989;2:163-73.
46. Santiago JM. The fate of mental health services in health care reform, I: a system in crisis. *Hosp Comm Psychiatry.* 1992;43:1091-4.