Physician Communication When Prescribing New Medications

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Background: Communication about taking a new medication is critical to proper use of drug therapy and to patient adherence. Despite ample evidence that medications are not taken as prescribed, few investigations have detailed the elements of communication about new medication therapy. This article describes and assesses the quality of physician communication with patients about newly prescribed medications.

Methods: This was an observational study that combined patient and physician surveys with transcribed audiotaped office visits from 185 outpatient encounters with 16 family physicians, 18 internists, and 11 cardiologists in 2 Sacramento, Calif, health care systems between January and November 1999, in which 243 new medications were prescribed. We measured the quality of physician communication when prescribing new medications.

Results: Physicians stated the specific medication name for 74% of new prescriptions and explained the purpose of the medication for 87%. Adverse effects were addressed for 35% of medications and how long to take the medication for 34%. Physicians explicitly instructed 55% of patients about the number of tablets to take and explained the frequency or timing of dosing 58% of the time. Physicians fulfilled a mean of 3.1 of 5 expected elements of communication when initiating new prescriptions. They counseled the most about psychiatric medications, fulfilling a mean of 3.7, 3.5, and 3.4, pulmonary, and cardiovascular elements, respectively.

Conclusions: When initiating new medications, physicians often fail to communicate critical elements of medication use. This might contribute to misunderstandings about medication directions or necessity and, in turn, lead to patient failure to take medications as directed.

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MEDICATIONS ARE CRITICAL to treating and preventing disease. Medication use in the United States has risen from approximately 4 drugs prescribed per person from 1995 to 1996 to 5.2 drugs from 2001 to 2002.[1] Almost half of all Americans take at least 1 prescription medication, and half of older patients take 3 or more medications.[1]

Although pharmaceuticals must be used properly to be effective, patients often do not use medications as prescribed.[2,3] This misuse sometimes results in progression of disease and treatment failure.[4-9] In addition, medication nonadherence can lead to adverse drug events, drug overdose or underuse, unnecessary hospitalizations[10-12] and prescriptions,[13] and higher costs.[9,14] Patients may not take new medications because of fear of interactions with other medications or adverse effects, perceived lack of efficacy, misunderstandings regarding necessity, or concerns about costs.[15]

Patients who report better general physician communication,[16] better explanations about how to take their medications,[17,18] and more medication information[18] are more adherent. One-on-one educational interventions can improve patient adherence and health outcomes.[19] In an effort to increase patient medication adherence and reduce medical errors, the Agency for Healthcare Research and Quality recommends that patients ask questions about their prescriptions to inform themselves about the following: the medication name, whether the medication is a trade or generic medication, medication purpose, how and when to take the medication, how long to take it, possible adverse effects and what to do if they occur, when to expect the medication to work and how to tell if it is working, and food, other medications, or dietary or herbal supplements to avoid when taking the medication prescribed.[20,21] Similarly, quality indicators for vulnerable older patients specify that

See also pages 1802, 1822, 1829, 1836, 1842, and 1848

physicians who prescribe new medications should educate their patients about the medication's purpose, how and when to take it, and expected adverse effects and important adverse reactions.[22] Education about these topics may reduce nonadherence that results from poor understanding about medication instructions.

It is unknown how well physician communication reflects counseling recommendations for prescribing new medications. Although survey studies suggest that physicians provide no verbal instructions for 19% to 39% of prescriptions[23,24] and medication dosing directions for only 50% to 62% of prescriptions,[23-26] these studies are subject to deficits in patient recall. Studies that observed actual behavior showed physicians offering no instruction for 17% of prescriptions given in a community health center[27] and for approximately one quarter of prescriptions for antibiotics.[28] In addition, physicians discussed medication adverse effects less than one third of the time.[28,29] Most of these studies did not address the individual components of medication instructions and did not compare counseling behaviors among medication types.

We assessed physician medication counseling in terms of important consensus panel–specified areas of communication.[21,22] We calculated a Medication Communication Index (MCI), which measures the quality of physician communication about medications, and characterized variation according to medication class and physician specialty.

METHODS

We analyzed data from the Physician Patient Communication Project, a study of physician-patient interactions in 2 health care systems in Sacramento, Calif, which audiotaped outpatient visits to family physicians, internists, and cardiologists. Survey data were gathered from patients before their visit and from physicians before and immediately after the patient's visit. Study design details have been described previously.[30] The University of California–Davis Institutional Review Board approved the overall study (992212), and the University of California–Los Angeles Institutional Review Board approved the analyses reported herein (exemption 04-193).

PHYSICIAN AND PATIENT SAMPLES

Twenty-two physicians were recruited from Kaiser Permanente and 23 from the University of California–Davis Medical Group. Sixteen family physicians, 18 internists, and 11 cardiologists participated; 1 family physician prescribed no new medications and was dropped from our sample. Physicians had a mean (SD) age of 44 (8.4) years and spent 87% of their time on patient care. All but 1 of the physicians was board certified, 71% were men, 89% were white, and 52% belonged to the University of California–Davis Medical Group.

Between January and November 1999, patients were randomly sampled from physician appointment books 1 to 2 days before anticipated office visits and telephoned by research assistants. Enrolled patients were English speaking and aged 18 years or older. All patients described a new or worsening medical problem or reported being "somewhat concerned" about their health or about having a potentially serious undiagnosed condition. Of 4560 patients selected for telephone contact, the response rate was 32%, and 909 (68%) of 1332 eligible patients were enrolled and provided informed consent.

NEWLY PRESCRIBED MEDICATIONS

Office visits were audiotaped and transcribed for 860 of the 909 participating patients. In the postvisit survey, physicians identified 270 visits in which new medications were prescribed. To verify the appropriateness of physician responses, we showed that in 90 randomly selected transcripts physicians correctly identified 24 of 25 encounters that involved a new prescription.

We defined a newly prescribed medication as a medication never before taken by the patient or a medication given for an acute symptom or condition (ie, an antibiotic or analgesic). A prescription in the same medication class as a previously prescribed medication was not considered a new medication. Medications that did not meet these criteria were excluded, leaving a total of 185 visits in which 243 new medications were prescribed.

MEASURES

Patient and Physician Characteristics

Patients provided information about demographic characteristics and prior visits to the physician seen. Patients also evaluated their physical functioning ($\alpha = .93$) using the 36-Item Short-Form Health Survey physical functioning scale, version 1 (with 100 indicating maximum functioning).[31] Physicians provided basic demographic information and characteristics of their practice.

Medication Characteristics

Medications were separated into medication classes according to their purpose. Over-the-counter (OTC) medications were defined as "medications sold over the counter." If an OTC medication was recommended at prescription strength, it was classified as a non-OTC medication. Medications recommended by physicians to be taken on an as needed basis were classified as pro re nata (PRN).[32] Absent a specific physician statement, a medication was classified as PRN if it was presumed acceptable for the patient to stop taking it on his or her own accord.

Qualitative Analysis

Based on previous literature[28,33,34] and clinical experience, 2 coders (D.M.T. and J.H.) of different disciplines developed codes characterizing all communication about newly prescribed medications. Using analytic induction, coding categories were expanded, split, merged, and adjusted until they were mutually exclusive, yet incorporated every conversational element about new medications.[35,36] These codes are described in detail elsewhere.[37]

One coder applied the codes to all 185 transcripts. A third coder independently coded 16% of the transcripts, achieving a mean κ score of 0.90 (range, 0.79-0.98). The most common source of inconsistency (81% of the disagreements) was caused by failure of coders to appropriately identify the specific statements for which a category was to be assigned.[38,39] Discrepancies between coders were resolved by consensus. ATLAS TI 4.2 was used to manage and analyze the transcripts (Thomas Muhr, Scientific Software Development, Berlin, Germany).

Statistical Analysis

Each qualitative code was assigned a variable corresponding to a communication behavior. The variables formed a data set

Table 1. Patient and Physician Characteristics*

Characteristic	Sample Sizes for Patients Given New Medications	Patients Given New Medications	Sample Sizes for All Patients	All Patients
Age, mean (SD), y	184	55.4 (15.6)	905	57.0 (15.3)
Male†	185	93 (50.3)	908	398 (43.8)
White	182	151 (83.0)	904	736 (81.4)
Married	182	107 (58.8)	901	544 (60.4)
Educational achievement	182		904	
≤High school		35 (19.2)		208 (23.0)
Some college		89 (48.9)		423 (46.8)
College graduate		58 (31.9)		273 (30.2)
Household income, $	172		847	
≤20 000		30 (17.4)		162 (19.1)
20 001-40 000		39 (22.7)		237 (28.0)
40 001-60 000		43 (25.0)		174 (20.5)
>60 000		60 (34.9)		274 (32.4)
Employment status	185		909	
Full or part time		89 (48.1)		412 (45.3)
Retired		65 (35.1)		335 (36.9)
Other		31 (16.8)		162 (17.8)
Has health insurance	185	174 (94.1)	905	869 (96.0)
UC-Davis patient	185	89 (48.1)	909	443 (48.7)
Had prior visit to same physician	184	139 (75.5)	892	714 (80.0)
Specialty	185		909	
Family medicine		57 (30.8)		333 (36.6)
Internal medicine		86 (46.5)		363 (39.9)
Cardiology		42 (22.7)		213 (23.4)

Abbreviation: UC, University of California.
*Data are presented as number (percentage) unless otherwise indicated.
†$P<.05$ for comparison between patients given new medications and full sample.

that contained information about new medication prescription communication, where the unit of analysis was the medication. Using Stata statistical software, version 8.0 (StataCorp, College Station, Tex), descriptive frequencies of major medication communication behaviors were calculated, overall, by medication characteristics and physician specialty.

Based on guidelines for communication about new medications,[20,40] we created a Medication Communication Index (MCI) to assess the quality of physician communication about new prescriptions. The MCI is a 5-point index that gives points for physician communication about the following: medication name (1 point), purpose or justification for taking the medication (1 point), duration of use (1 point), adverse effects (1 point), number of tablets or sprays to be taken (0.5 point), and frequency or timing of medication ingestion (0.5 point). For dermatologic medications, a full point was given for discussing the frequency or timing of medication use, since it is difficult to quantify an amount of cream or lotion. Assigning 0.5 point to the number of tablets and frequency of medication use reflects "directions" carrying an equal weight relative to the other MCI components. The MCI was computed for each general medication class, OTC and PRN medication status, and physician specialty.

We performed bivariate analyses to assess the relationship between the MCI and patient, physician, and medication characteristics using *t* tests and analysis of variance, as appropriate, for continuous and categorical measures. Continuous variables included physician and patient age, physical functioning, measured visit length, and total number of new medications prescribed during the visit. Categorical variables included patient sex, race, educational achievement, and prior visits to the physician; physician sex, specialty, and site of practice; and medication class and OTC and PRN status.

All independent variables were included in a multiple linear regression model with the MCI score as the outcome variable. Since intraclass correlation estimates were small (<0.001) at the patient, physician, specialty, and site levels, we did not adjust for clustering. Model goodness of fit was evaluated using adjusted R^2.

RESULTS

Forty-four physicians prescribed 244 new medications to 185 patients. Physicians prescribed a mean of 5.5 new medications (range, 1-17) and gave new prescriptions to a mean of 4.2 patients (range, 1-9). Forty-seven patients received more than 1 new prescription and 9 patients received 3 prescriptions or more.

Patients had a mean age of 55 years, half were male, most had at least some college education, and almost all had health insurance. Most were white, just more than half were Kaiser Permanente patients, and 75% had a prior visit to the physician who prescribed the new medication. Internists saw 47% of the patients; family physicians, 31%; and cardiologists, 23%. Patients receiving new medications had similar characteristics to the 909 patients in the full sample, except they were more likely to be male (**Table 1**). New medications included 46 cardiovascular medications; 42 ear, nose, and throat (ENT) preparations; 35 analgesics; 35 antibiotics; 21 dermatologic creams; 21 psychiatric medications; and 11 pulmonary medications.

Examining the individual components of the MCI, physicians described 97% of the new prescriptions but stated trade or generic names for 74%. Physicians stated the purpose of or justification for taking a medication for 87% of the prescriptions, duration of intake for 34%, the number of tablets or sprays for 55%, frequency or timing of

Table 2. Physician MCI Scores by Medication Class, Physician Specialty, and Medication Type

	No. of Patients	MCI Score, %[a]		MCI Score Components, %						
		Mean (SD)	Range	Name	Specific Name	Purpose or Justification	Duration of Intake[b]	Tablets or Sprays	Frequency or Timing of Intake	Adverse Effects
General Medication Class[c]										
Analgesic	35	3.20 (1.11)	1-5	100	86	80	37	49	54	43
Antibiotic	35	2.94 (1.05)	1-5	97	54	80	54	40	46	14
Cardiovascular	46	3.43 (0.81)	1-5	98	74	98	17	63	63	67
Dermatologic[d]	21	2.71 (1.06)	1-4.5	100	62	86	43	NA	48	5
Ear, nose, and throat	42	2.88 (0.94)	1-5	98	71	88	26	45	55	24
Gastrointestinal	15	2.93 (0.96)	1-4	93	73	87	47	67	67	0
Psychiatric	21	3.67 (0.93)	2-5	95	95	95	38	71	81	62
Pulmonary	11	3.50 (1.16)	2-5	100	82	91	36	73	82	36
Other	17	2.68 (1.04)	1-4	88	82	76	12	59	53	35
Mean	**243**	3.11 (1.02)	1-5	97	74	87	34	55[e]	58	35
Physician Specialty										
Family medicine	76	3.11 (1.08)	1-5	96	72[f]	87	33[f]	63[g]	66	33[f]
Internal medicine	120	3.07 (1.03)	1-5	98	78[f]	86	40[f]	47[g]	53	33[f]
Cardiology	47	3.22 (0.90)	1-5	96	68[f]	91	19[f]	62[g]	60	55[f]
Medication Type										
OTC	41	2.51 (1.03)[h]	1-5	100	88	73[i]	27	50[j]	44[f]	12[i]
Non-OTC	202	3.23 (0.98)[h]	1-5	97	71	90[i]	35	56[j]	61[f]	43[i]
PRN	97	2.99 (1.10)	1-5	99	77	84	34	51[k]	49[f]	35
Not PRN	146	3.18 (0.97)	1-5	96	72	90	34	58[k]	64[f]	39

Abbreviations: MCI, Medication Communication Index; NA, not applicable; OTC, over the counter; PRN, pro re nata (as needed).

[a]The MCI is a 5-point scale that reflects the quality of physician counseling given to patients. The score is calculated by assigning 1 point to each of the following topics if patients are counseled about these topics: medication name, purpose or justification, duration, and adverse effects. Counseling about the number of tablets or sprays and frequency or timing of use is given 0.5 point each.

[b]For medications that are used on a PRN basis, statements about using the medications as needed count as fulfilling duration.

[c]$P \leq .001$ for differences among general medication class in mean MCI score, name, specific name, duration, and adverse effects.

[d]For dermatologic medications, the MCI is calculated by assigning 1 point to each of these topics: name, purpose or justification, duration, frequency or timing of use, and adverse effects.

[e]n = 222, since tablets or sprays are not applicable to dermatologic medications.

[f]$P < .05$.

[g]n = 43 for family medicine, n = 50 for internal medicine, and n = 29 for cardiology, since tablets or sprays are not applicable to dermatologic medications.

[h]$P \leq .001$.

[i]$P \leq .01$.

[j]n = 28 for OTC medications and n = 194 for prescription medications, since tablets or sprays are not applicable to dermatologic medications.

[k]n = 93 for PRN medications and n = 129 for not PRN medications, since tablets or sprays are not applicable to dermatologic medications.

intake for 58%, and adverse effects for 35% (**Table 2**). **Table 3** presents examples of the range of statements that satisfied these communication categories.

Significant differences among the medication classes were found concerning education about medication name, duration of use, and adverse effects. Generic or trade names were stated for 95% of psychiatric medications but for only 54% of antibiotics. Education about duration of medication intake ranged from 17% for cardiovascular medications to 54% for antibiotics, whereas adverse effect counseling ranged from less than 15% for dermatologic preparations and antibiotics to more than 60% for psychiatric and cardiovascular medications. Directions concerning the number of tablets or sprays were addressed for 40% of antibiotics and more than 70% of psychiatric and pulmonary medications. Directions about frequency of medication ingestion ranged from 46% for antibiotics to more than 80% for psychiatric and pulmonary medications (Table 2).

Cardiologists specified the medication name and duration of intake less than primary care physicians but counseled their patients more frequently about adverse effects. Overall, physicians described the medication's generic or trade name more often for OTC medications than for non-OTC medications but conveyed less education about medication purpose or justification, frequency or timing, and adverse effects. Compared with medications prescribed on a regular basis, PRN medications were associated with less communication in all categories except for medication name and with significantly less conversation about frequency or timing of intake (Table 2).

The mean MCI score was 3.1 on a 5-point scale, indicating that 62% of necessary elements of new medication prescribing education were communicated. The MCI score differed significantly among medication classes, ranging from 2.7 for dermatologic preparations to 3.7 for psychiatric medications. There was no significant difference between specialists and primary care physicians or between medications taken regularly and those taken PRN. However, the MCI was higher for non-OTC (compared with OTC) medications.

In multivariate analysis with the MCI score as the outcome variable, psychiatric and analgesic medication prescriptions were associated with significantly higher communication scores than ENT preparations. For example, patients receiving psychiatric medications received nearly

Table 3. Examples of the Range of Statements Satisfying MCI Categories

MCI Communication Category	Points	Statement Examples Fulfilling the Category
Name	1	Any trade name Any generic name Medication class or function: "Blood pressure medication." "Pain medication." "Muscle relaxant."
Purpose or justification	1	Statements conveying medication indication or what medication is used for: ". . .for the nausea." "Yeah, I would call it a nummular eczema which you could treat with a cortisone cream." "I'm going to give you an inhaler for upstairs, for your nose." "I think we could achieve adequate control of your blood sugar with those medications." Statements about medication's mechanism of action: "I want to slow your heart rate down." "So this will get rid of the water much faster." Statements offering additional explanations as to why a medication was suited to a particular patient: "It's better for your weight." "We want the desired effect of calming you down." ". . .because I think what's choking you up is stuff running down your throat."
Duration of intake	1	Explicit statements of duration: "I am going to give you a prescription just for 1 week." ". . .you probably shouldn't need it for very long, you know, a couple of days maybe." ". . .the medication is for about 9 to 12 weeks." Vague references to duration: "I think we'll put you on some antibiotics for a while." "You have to treat orally for a long time." "I don't expect you to be on this forever."
Directions for use	1	
No. of tablets or sprays	0.5	"You can take 2 or even 3 at a time or up to 4 a day even or more." ". . .half of a pill." ". . .1 or 2 squirts in each nostril."
Frequency or timing of intake	0.5	"Just take them only once a day." "Take it a couple times a day." "And take the cough syrup at night." "So, when you would normally take your Betapace." "One maybe Wednesday and Saturday or something like that."
Adverse effects	1	Expected adverse effects: "It might make you a little bit sleepy." Statements about the lack of adverse effects: "So I can't guarantee that there wouldn't be side effects but they are very rare with this." "So I wouldn't expect any major side effects." "You'll be just perfectly fine on it."

Abbreviation: MCI, Medication Communication Index.

1 additional element of counseling when compared with those receiving ENT prescriptions, largely because of better adverse effect counseling. Increased patient physical functioning at the time of the visit and non-OTC medication status also were associated with better communication. No significant associations were found between sex or patient or physician age and the quality of communication and no significant difference among medical specialties related to communication (**Table 4**).

COMMENT

This study demonstrates spotty physician counseling about new medication prescriptions. Although physicians educated patients more about psychiatric and analgesic medications, the overall quality of communication was poor even for these medication types and could contribute to patient misunderstandings about how and why to take their new medications. Physicians conveyed full medication dosing directions for less than 60% of all medications and informed patients about duration of intake and adverse effects or adverse events only approximately one third of the time. Although patients may seek information about their medications from a variety of sources, including pharmacists and medication package inserts, information offered by physicians is inadequate to meet patient needs. For example, patients not educated about the expected duration of medication use may not realize that medications given for chronic conditions need to be refilled. Furthermore, patients tend to be concerned about the adverse effects of a medication,[41-44] and adequate physician discussions could allay fears.

These findings suggest that patient reports of poor physician education concerning medication prescriptions[23-26,45] may not so much reflect lack of patient recall as missed opportunities for physician prescribing education. Communication is particularly sketchy when OTC medications are recommended. Although it might be ar-

Table 4. Multivariate Model Predicting the MCI, Including Medication, Patient, and Physician Characteristics as Independent Variables*

Independent Variables	Univariate Relationship: Mean (SD) MCI Score†	Univariate Relationship: Correlation Coefficient†	β-Coefficient for Multivariate Relationship†
Medication class			
Analgesic	**3.20 (1.11)**		**0.59**
Antibiotic	**2.94 (1.05)**		–0.13
Cardiovascular	**3.43 (0.81)**		0.40
Dermatologic	**2.71 (1.06)**		0.16
Gastrointestinal	**2.93 (0.96)**		0.13
Psychiatric	**3.67 (0.93)**		**0.79**
Pulmonary	**3.50 (1.16)**		0.41
Other	**2.68 (1.04)**		–0.17
Ear, nose, and throat	**2.88 (0.94)**		NA
Patient age		0.002	–0.01
Female patient	3.04 (1.08)		–0.13
Male patient	3.18 (0.95)		NA
Prior visit to same physician	**3.03 (1.04)**		–0.26
New to physician	**3.40 (0.88)**		NA
Physical functioning at time of visit		**0.03‡**	**0.06**
Educational achievement			
≤High school	2.99 (1.00)		–0.07
Some college	3.11 (1.13)		0.09
College graduate	3.16 (0.86)		NA
Specialty			
Family medicine	3.11 (1.08)		0.21
Internal medicine	3.07 (1.03)		0.17
Cardiology	3.22 (0.90)		NA
Kaiser site	3.10 (1.03)		0.05
UC-Davis Medical Group	3.12 (1.01)		NA
Female physician	2.98 (1.02)		–0.11
Male physician	3.17 (1.02)		NA
Physician age		0.004	0.02
Total visit length		0.004	0.005
OTC medication	**2.51 (1.03)§**		**–0.73§**
Non-OTC medication	**3.23 (0.98)§**		NA
PRN medication	2.99 (1.10)		–0.05
Non-PRN medication	3.18 (0.97)		NA
Total No. of new medications prescribed during visit		0.01	–0.16

Abbreviations: MCI, Medication Communication Index; OTC, over the counter; PRN, pro re nata (as needed); UC, University of California.

*n = 227; model-adjusted R^2 = 0.16. Independent variables have reference groups as follows: medication class: ear, nose, and throat medications; patient age: per decade; female patient: male; prior visit to same physician: no prior visit to physician; physical functioning: per 10 points on 100-point scale; education: college graduate; specialty: cardiology; Kaiser site: UC–Davis Medical Group; female physician: male; physician age: per decade; total visit length: per minute; OTC medication: non-OTC medication; PRN medication: non-PRN medication; and total number of new medications prescribed during visit: per medication.

†Boldface entries indicate $P \leq .05$.

‡$P < .01$.

§$P \leq .001$.

gued that patients may not need as much instruction about OTC medication use, patients not understanding the indications for OTC medications may be unaware when to seek help if their condition is not improving.[46] Similarly, education about PRN medications is important because patients not educated about the maximum number of tablets to take or about the frequency of dosing may be at risk for medication overdose. Patients also may not realize that use of PRN medications can be stopped in the absence of symptoms.

Psychiatric and analgesic medications, which have the potential for serious adverse effects or adverse reactions, were associated with more medication prescribing communication. Yet there remains room for improvement, even with these medications. Better physical functioning at the time of the visit was significantly associated with better communication. This finding is disconcerting, since patients with more serious or chronic diseases are likely to be following more complicated drug regimens and also may be in need of more intensive discussions about new prescriptions. No differences in the quality of communication about prescribed medications were found between cardiologists and primary care physicians, suggesting that the higher medication adherence rates of cardiologists' patients, when compared with patients of other physician specialties (found in a previous study[47]), may be because of factors other than differences in physician communication.

Patients receiving less counseling about their medications may be less likely to adhere to their prescribed regimen,[34,48,49] in part because they may not understand how to take their medications. It was common for the physicians in our study to neglect giving specific directions about how to take medications. The following exchange is a physician's complete set of instructions to a patient about an antibiotic:

Physician: "If I'm writing antibiotics, are you allergic to penicillin?"

Patient: "No, I'm not allergic to anything."

Physician: "Okey dokey."

It is unclear what medication is being prescribed, and there was no instruction about how to take the medication or about potential adverse effects. Although physicians may expect pharmacists to provide patient education about medications,[50] this may not always be the case.[24,51,52] Lack of instructions might lead patients not to complete an antibiotic course and may be a particular problem for patients who have difficulty reading medication container labels.[53]

The deficits in medication prescribing noted in this analysis should be viewed in the context of several limitations. Findings may not be generalizable to patients in other settings. Since these data were collected, medication conversation may have shifted because of societal and insurance changes. The Hawthorne effect may have altered physician behavior during office visits, yet the presence of a tape recorder may have stimulated increased physician counseling. Computations of the MCI scores are conservative, since we required little clarity in communication for physicians to receive credit and counted vague statements as fulfilling communication categories. In addition, under circumstances when a medication is named by its functional purpose (eg, blood thinner), 2 of 5 points (name and purpose) on the MCI were conferred.

Unless it was explicitly mentioned during the office visit, we were unable to capture whether patients were given written information to supplement or replace verbal communication. Our findings do not capture envi-

ronments where health care systems employ pharmacists or nurses to fully educate patients about new medications after physician visits. Yet even in such systems, it is unknown whether patient adherence or health outcomes are affected by the type of health care clinician discussing the new prescriptions.

This study provides evidence of suboptimal patient counseling about newly prescribed medications, especially about the duration of medication use and potential adverse effects. Patients not understanding these aspects of their new medications may discontinue taking medications unnecessarily. The MCI provides a means to assess the quality of physician communication about new prescriptions and might be used to measure the effect of interventions to improve prescribing communication. Efforts to promote better communication about new prescriptions should not focus solely on improving the quality of discussions without considering the tradeoffs that may occur in time-compressed visits. More research is needed to investigate how much time physicians spend educating patients about new medications and whether better communication is associated with more appropriate patient medication use and health outcomes.

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