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Prescribing new medications: A taxonomy of physician–patient communication

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Abstract

Physician-patient communication about new medications can influence patient medication adherence. Little is known about the detailed content of conversations about new medications, or about how physicians and patients word information when discussing new medications. Yet nuances in communication may influence patient comprehension and affect behaviour. A comprehensive coding framework delineating the intricacies of physician-patient discussions is needed to better understand the range of communication about new prescriptions. This study used analytic induction to analyse 185 audiotaped outpatient encounters, during which 243 new medications were prescribed by family physicians, internists and cardiologists in two healthcare settings. Seventy-six codes were developed to demonstrate the range of physician counselling about information concerning new prescriptions, such as medication name, purpose, directions for use, side effects, acquisition and monitoring. The conversational content represented by the codes can be used to understand the breadth of conversations regarding new medications, identify sources of potential patient misunderstandings when medication instructions are conveyed, and inform recommendations for desired communication content. The coding system also can be used to measure the quality of new medication discussions for linkage to outcomes and can inform interventions to improve communication when prescribing new drugs.

Keywords

provider patient communication; physician patient relationship; pharmaceuticals; prescription medication; taxonomy; qualitative analysis

1. Background

Pharmaceuticals are a major form of medical therapy, but are effective only when used properly. Medication non-adherence can contribute to unnecessary hospitalizations (Col *et al.* 1990) and medication prescriptions (Muhlhauser *et al.* 1993), disease progression and treatment failures (SHEP Cooperative Research Group 1991). Misunderstandings between physicians and patients can result in poor patient outcomes (Britten *et al.* 2000). Though patients reporting better general physician communication (Schneider *et al.* 2004), better explanations about how to take their medications, more medication information, and greater physician concern (Falvo *et al.* 1980; Hulka *et al.* 1976) are more adherent, physician counselling about medication adherence varies considerably (Roberts and Volberding 1999; Russell *et al.* 1985).

Good physician-patient communication is especially important when new medications are prescribed, since patients frequently misunderstand or have difficulty reading medication labels (Davis *et al.* 2006a, b; Wolf *et al.* 2006). The content of discussions about medications has not been well explored. Yet small nuances in physician wording may be critical to patient interpretation of essential information, and influence patient actions. A comprehensive description of the different ways in which physicians communicate medication-related information is needed to inform recommendations for discussions to optimize patient understanding.

Several studies have used qualitative methods to research physician medication prescribing behaviours and expectations (Braddock *et al.* 1999; Britten *et al.* 2000; Britten and Ukoumunne 1997; Stevenson *et al.* 2000b; Webb and Lloyd 1994), and others have described physician-patient interaction coding systems (McNeelis 2001; Meredith *et al.* 2001; Roter and Larson 2001; Shaikh *et al.* 2001; Street and Millay 2001; von Friederichs-Fitzwater and Gilgun 2001). However, only a few coding systems offer the capacity to describe the actual content of discussions concerning medications. Some of these describe taxonomies of physician and patient question-asking about medications that patients are already taking (Sleath *et al.* 1999). Others illustrate a few select elements of instruction about medications (Makoul *et al.* 1995; Stevenson *et al.* 2000a; Svarstad 1974), but do not provide resources to examine the manner in which these elements are communicated.

A few studies present more comprehensive coding systems describing all conversation about studied medications. Table 1 compares their designs. These include studies focused on office visits by hypertensive patients (Scherwitz *et al.* 1985), patients receiving antibiotic prescriptions (Cockburn *et al.* 1987), and visits to primary care physicians (Richard and Lussier 2006a,b). Some studies illustrate similar themes, but none delve into the deeper level of detail necessary to understand how patients might interpret communicated information.

A comprehensive analysis of physician-patient interactions should 'take account of salient dimensions of interpersonal communications, deal with the distinctive and special features of clinician-patient interactions, and lend itself to application within the health care system,' so that it can later be applied to improve clinician interaction skills (Wasserman and Inui 1983: 281). To be maximally effective, a comprehensive analysis of new medication prescribing interactions should lend itself to measuring the content and style of both physician and patient communication about new medications.

Though previous studies depict conversations occurring around new medication prescribing, most of these coding systems were developed prior to the introduction of uniform recommendations concerning medication communication (Agency for Healthcare Research and Quality (AHRQ); Shrank *et al.* 2007), and do not detail how specific information can be conveyed in a clinically meaningful manner. Since only broad categories of information-giving were examined, specificities in communication based on different ways of wording information were not previously captured. These specificities inform what patients understand and take away from the information conveyed. Their measurement is critical to assessing the clarity of information provided, and to designing future interventions to improve physician-patient communication concerning new medications. Moreover, previous systems focused only on primary care physicians; it is not known whether specialist physicians discuss new medications in the same manner. Building on previous work and on uniform recommendations concerning medication communication, this paper describes the development of a clinically relevant coding system, based on outpatient primary care and cardiology physician visits, to describe the full range of physician and patient conversations when new medications are prescribed.

2. Methods

This study uses audiotaped data from the Physician Patient Communication Project, a study of 909 physician–patient interactions conducted in two healthcare systems in Sacramento, California between January and November 1999 and designed to investigate physician–patient interactions and request fulfilment. Details of the study design were described previously (Kravitz *et al.* 2002a). This study was approved by the Institutional review Boards of the University of California, Davis (#992212) and University of California, Los Angeles (Exemption # 04-193).

Sixteen family physicians, 18 internists and 11 cardiologists from Kaiser Permanente (22 physicians) or the University of California-Davis Medical Group (UCDMG) (23 physicians) participated in the study. Patients were randomly sampled and telephoned by research assistants one or two days before scheduled office visits. Enrolled patients were English-speaking, 18 years of age or older, and were able to complete a written English-language questionnaire. Patients also had a new or worsening problem, or were at least ‘somewhat concerned’ about their health. All enrolled patients gave informed written consent, and each received \$10 for study participation.

When analysing the physician–patient interactions, we defined a newly prescribed medication as one never before taken by the patient, or as a medication given for an acute symptom or condition (such as an antibiotic or analgesic). A prescription in the same medication class as a previously prescribed medication was not considered to be a new medication, unless prescribed for an acute condition.

In 263 of 909 total visits, physicians reported prescribing a new medication. Analysis of 90 randomly selected transcripts (10% of total transcripts) indicated that the survey question correctly identified 24 of 25 transcripts containing a new prescription. Our criteria for a new medication were met in 176 of 263 visits. We also identified seven new prescription visits, for which the survey item response about new medication prescriptions was missing and two additional transcripts containing new medication prescriptions from separate random readings, giving a total of 185 visits in which 243 new medications were prescribed.

2.1. Development of coding system

The codes in this system were developed by following in the analytic tradition of grounded theory (Glaser and Strauss 1967; Miles and Huberman 1994; Strauss and Corbin 1990), in which we identified categories and concepts emerging from the transcripts themselves (Bernard 2002). Every utterance pertaining to a new prescription was coded, and coding categories were expanded, split, adjusted and merged in an iterative process until no additional categories could be generated (Glaser and Strauss 1967; Strong 1979), giving a total of 76 codes describing communication about new medications. To present the codes in a clinically meaningful manner, the authors noted the general order in which themes appeared during the office visits.

All of the codes originated from recurring themes in our data. We independently converged on a number of themes described in existing literature (Cockburn *et al.* 1987; Scherwitz *et al.* 1985; Svarstad 1974) and guidelines (AHRQ; Shrank *et al.* 2007), and validated by clinical experience. However, our inductive coding compelled us to generate additional themes, and to describe themes in more detail than in previous studies. Though we are able to collapse these themes if desired, they provide a richer description of the discussion content, and the specific wording of the themes can have important clinical implications. Table 2 compares some themes from our coding system with those from other studies.

Two coders (DMT, JH) worked together to develop the codes and to ensure reliable implementation. ATLAS/ti, a text analysis program, was used to review the transcripts and to assign a code to all conversation pertaining to a newly prescribed medication (DMT). A third coder (DAP) independently coded 29 (16%) randomly selected transcripts. Excluding categories containing fewer than five quotations, the overall mean kappa score was 0.90 (range = 0.79–0.98). Eighty-one per cent of the inconsistencies involved unitizing reliability (one coder failed to appropriately identify a specific statement for which a coding category should have been assigned) (Garvin *et al.* 1988; Kravitz *et al.* 2002b), rather than classification reliability (disagreements about the category assigned). The 45 coder disagreements about identified statements (4% of the total statements coded) were resolved by consensus.

3. Results

Physicians had a mean age (SD) of 44 (8.4) years and on average spent 87% of their time on patient-care activities. All but one was board-certified; 71% were men; 89% were Caucasian; and 52% belonged to UCDMG. Patients had a mean age (SD) of 55.4 (15.6) years. Fifty per cent were female, 83% were white and 59% were married. Eighty per cent had completed at least some college, 40% had an annual household income less than \$40 000, and 52% had Kaiser insurance. A diverse group of medications were prescribed: 16% antihypertensive medications, 14% antibiotics, 14% analgesics, 9% antidepressants or mood stabilizers, 7% antihistamines or decongestants, 8% dermatologic preparations, 6% nasal sprays, 6% gastrointestinal medications and 5% oral inhalers.

The 76 themes represented by the coding system presented in this paper include 38 major elements of discussion that often appeared during encounters in the order outlined in Table 1. However, the codes could appear in any order, and often were interspersed with non-medication content. An additional five major elements capture patient-initiated questions and requests, resistance towards starting recommended medications, physician partnership-building statements, and physician acquiescence to patient requests. There were no differences in the themes generated from visits to family medicine, internal medicine and cardiology physicians. Detail about the codes is contained in the Appendix. Illustrations of the range of selected major codes are presented below.

3.1. Medication identification

When initiating prescriptions, physicians refer to medications by the medication name, by discussing its purpose, and/or by describing the reason the medication is being prescribed.

3.1.1. Medication name—Physicians can identify medications using either a brand or generic name, or both. They can mention the medication class such as beta-blocker or antibiotic. Physicians also name drugs using the medication purpose such as muscle relaxant, water pill, pain medicine.

3.1.2. Medication purpose—Conveying medication purpose helps patients understand the underlying necessity for a prescription. Without knowing the importance of taking a medication, patients may be more likely to miss doses or to discontinue their medications. Physicians can communicate medication purpose by referencing a drug's functional class such as cough syrup, decongestant, anti-anxiety medication. Physicians referring to medication purpose in this manner may offer more detailed explanations, for example:

DOC: You may need muscle relaxants to relax the muscles a little bit.

DOC: ... it's a stool softener, will make your bowel movements kinda soft.

Explaining the medication indication, or what a medication is used for, can also convey medication purpose. These statements may simply link a medication and its indication:

DOC: This is a coated aspirin ... for stroke prevention.

DOC: I'm gonna give you a little um, prescription to see if we can clear that up.

Medication purpose also can be transmitted by educating patients about a medication's mechanism of action:

DOC: It's a medicine that helps protect the lining of the intestine.

DOC: It's an antidepressant but we also use it to block pain sometimes.

Statements of purpose may occur in conjunction with comments forecasting the need for a medication: 'Let's see if we can't help you pass your urine better', or prior to forecasting comments: 'Ah, those sound like tension headaches to me'. In each of these examples, the physician subsequently introduced the necessity for a medication to treat the condition.

3.1.3. Justification for use—In contrast to purpose statements, justification statements do not specifically mention a patient's diagnosis or indication for using the medication, but rather offer more detailed reasons for taking a medication. For example, justifications may explain why a particular medication was chosen over another, why a medication is good for the patient's individual situation, or why it is important for the patient to take a medication:

DOC: It is better for your weight.

DOC: In your case we want that just to mellow you out.

Justification statements also can advocate for a medication by addressing the minimization of side effects, since a medication choice may reflect the side effect profile:

DOC: It's basically a weaker water pill so you shouldn't have to rush off to the John like you were saying.

DOC: We want to try to prevent any problems with your stomach.

By addressing a patient's specific situation or concerns, justification statements may increase patient understanding about the necessity for taking a medication.

3.2. Directions

Details of how and when to take a medication, how much to take, and how long to continue taking it are arguably among the most important pieces of information that a patient should know about their medication. Physicians relate directions by describing dosages, numbers of pills, frequency of ingestion and other aspects of dosing.

3.2.1. Medication dose—Medication dose can be discussed in terms of the actual quantity of the drug to be ingested or by talking about relative dose (e.g. 'high dose' or 'low dose'):

DOC: So, we will start out at a low dose, just 25-milligram tablet at nighttime.

Sometimes medication dosage and pill size are referred to interchangeably:

DOC: And then, we can give you bigger pills ... so if we decide to then double the dose of the Depakote, rather than taking six pills at night ...

When this physician refers to bigger pills, he actually means a higher dose of the Depakote. Larger pill sizes do not always correlate with higher medication doses.

3.2.2. Number of pills or sprays—Patients need to know the number of pills to take or sprays to use so that they do not over- or under-dose their medication. Physicians instruct patients about the number of pills or sprays in three ways: vaguely, explicitly and implicitly. This category does not apply to dermatologic preparations, since the amount of cream to apply cannot be easily quantified.

Vague instructions about the number of pills to ingest include:

DOC: You can take two or even three at a time or up to four a day even, or more.

DOC: The puff on an Albuterol inhaler would be one to two puffs four times a day.

Explicit instructions about the number of pills or sprays contain concrete numerical references:

DOC: You use two puffs.

The number of pills to be taken or sprays to use may not be explicitly mentioned unless it is greater than one. If a numerical value is not expressly stated, it may be inferred that the patient should take one pill or use one spray at the indicated interval. Such statements are classified as implicit statements about the number of pills or sprays:

DOC: Take that three times a day.

DOC: It's going to say every 8 hours.

Few patients in this study sought clarification about the number of tablets when it was expressed implicitly, suggesting that they either understood or did not ask when confused.

3.2.3. Frequency of medication intake—Unless patients understand how often a medication should be taken, they will be unable to adhere. Physicians discussing frequency of use presented this information vaguely, explicitly or implicitly. Vague statements about frequency include:

DOC: And I'll just have you use it a couple of times a day.

DOC: I would do it four or five times a day.

Explicit frequency statements quantify how often a medication is to be used:

DOC: This is your antibiotic, once a day.

DOC: ... take this water pill twice a week.

Since misinterpretations can occur when physicians discuss taking multiple pills a day, the following statements are classified as implicit, instead of explicit:

DOC: Every day, two puffs in each side.

DOC: It's two pills a day.

Despite the implication that the puffs and pills are to be taken once a day, it is unclear whether they should be taken simultaneously, or spaced out during the day.

3.2.4. Timing of medication intake—Instructions about the timing of medication ingestion impart more detail than statements of frequency alone. Four times a day can mean every six hours, or four times during a patient's waking hours. Statements about timing can clarify some of these issues:

DOC: One pill before lunch and one pill before bedtime.

DOC: One every eight hours...

Instructions detailing both frequency and timing of medication use can be helpful for precise specification:

DOC: The Augmentin is twice a day, once in the morning and once at night.

3.2.5. Duration of use—Education about the expected duration of use for both acute and chronic medications may keep patients from taking drugs longer than required or from prematurely discontinuing medications. Physicians discuss duration of medication use both explicitly and vaguely. Explicit references to duration contain numerical references to time or indicate when a medication should be stopped:

DOC: Four times a day for ten days.

DOC: This is the dicloxacillin ... take that twice a day, until it's gone.

Vague references about duration of medication use may compel patients to make their own assessment of appropriate duration:

DOC: I'm mostly looking at this for the very short term.

DOC: Try the Trilisate for a while.

3.3. Side effects/adverse events

Physicians discuss medication side effects by specifying potential side effects, by listing side effects generally not associated with the medication, and by making non-specific statements. Specific mentions of potential side effects or adverse events include statements such as:

DOC: It might make you a little bit sleepy.

DOC: You'll feel your pulse is going to be slow with this.

They also may mention side effects that are unlikely to arise from the medication:

DOC: It should not make you sleepy.

DOC: And it won't make you run to the bathroom a lot.

Physicians also make more non-specific comments about side effects:

DOC: ... this medication doesn't have a whole lot of side effects.

DOC: I wouldn't expect any major problems.

Though not addressing potential side effects of the prescribed medication, these statements may alleviate patient concerns.

3.4. Contingency plans

Contingency plan statements are usually made after physicians describe medication side effects, and suggest patient responses to problems with their medications such as experiencing medication side effects, missing a medication dose, or not having any symptom improvement:

DOC: If it starts causing your stomach to rebel, you need to stop it.

DOC: If that doesn't work out, you give me a call again.

Patients educated about contingency plans may avoid unnecessary cessation of their medications, and may appropriately discontinue ineffective medications or those causing adverse reactions.

3.5. Plans for monitoring medication efficacy/side effects

Medication follow-up statements inform patients about plans to assess medication efficacy and about laboratory tests to assess therapeutic response or toxicity.

DOC: We need to get you set up for a blood sugar test after you're on this medicine a while to make sure it's doing the job.

DOC: ... we will start this today, and get another electrocardiogram Friday.

Since laboratory testing or other studies are not necessary for all medications, these types of statements may not be applicable for all prescriptions. Medication follow-up statements also include instructions for patient self-monitoring or for physician follow-up:

DOC: ... and also I want you to monitor your blood pressure twice a week, okay?

DOC: Then we will get an appointment in about four to six weeks.

These instructions inform patients about how soon they should see improvement in their condition, and can encourage patients to follow up with their physician.

3.6. Adherence counselling

Physicians counsel their patients about the importance of medication adherence by reiterating the need to take a medication according to the recommended regimen:

DOC: Make sure you take these.

DOC: You should finish all of the medications.

Physicians also may assess the likelihood of patient adherence or acknowledge the difficulty of taking medications:

DOC: Do you think you will be able to remember twice a day?

DOC: I know that is a lot.

Adherence counselling can be taken a step further by giving patients tips to remember taking their medications:

DOC: Stick the pills right by your toothbrush. When you brush your teeth, take a pill.

Physician acknowledgement of patient difficulty with adherence and suggestions for ways to overcome these difficulties may increase medication adherence.

3.7. Patient initiation

The 'patient initiation' code can be used in association with most other codes in the coding system. For example, the patient's comment: 'Oh my God! I couldn't afford that,' would be assigned codes for both 'patient initiation' and for 'cost/insurance' indicating patient instigation of the cost/insurance discussion. This code allows for the characterization of any patient contribution to the conversation.

3.8. Patient resistance to new prescription

Patients resistant to receiving a new prescription express their aversion in several different ways. Some directly tell the physician that they do not want the medication.

PAT: Now I, uh, to be honest with you, I wouldn't take this medication.

DOC: Why is that?

PAT: Because, personally ... I don't think anything that does not have an abuse potential will work.

Other patients may instead minimize their symptoms, as does the following patient whose physician recommends Citrucel for her bowel movements:

DOC: And try it for a few weeks and just see. It is not going to do you any harm.

PAT: It really doesn't bother me.

Patients hesitant about a new prescription also may question their diagnosis or the rationale for the medication:

DOC: You have a genetic trait and you have very high triglycerides and very high cholesterol ... I feel that even your HDL should be much higher than this, 38 is low. So Lipitor will be highly effective in your case.

PAT: This is the first time I had an HDL.

DOC: No, no you already ...

PAT: Is that the one I had? Because I usually never ...

DOC: But even if HDL although is normal for females we expect it to be around 60 or 70. Yours is only 38 that makes it abnormal ...

PAT: Will this medication also possibly affect the liver like that other one?

DOC: Yes, all statin drugs do.

This patient initially questions the one part of her laboratory testing that is not markedly abnormal, but is later able to express her true concern about the potential adverse effects of the recommended medication. Physician recognition of subtle patient comments that may not seem directly related to the medication discussion may promote discussions about patient resistance to medications and prevent non-adherence.

3.9. Partnership building

Physicians instituting discussions about new prescriptions may employ partnership-building terminology (statements using inclusive language, such as 'we') in an effort to form an alliance with and involve the patient in developing a therapeutic plan:

DOC: We are going to start another one called nortriptyline.

DOC: I think we could achieve adequate control of your blood sugar with those medications.

Partnership-building statements also include physician attempts to solicit patient participation in decision-making, and efforts to investigate patient perspectives about recommended medications.

DOC: Do you want some Compazine to take if you get nauseated?

DOC: You can tell me that, yes, I would like to try it, or I would rather not.

Some physicians also assess patient understanding and comfort with the treatment plan:

DOC: ... how'd you feel about doing that for two weeks?

DOC: Now, do you understand all of this stuff?

DOC: Does that sound reasonable?

Physicians also make statements indicating that either s/he will partner with the patient to review the prescribed medication at a later date, or that the patient should be responsible for assessing the medication effect:

DOC: Try it and let me know how that works out for you, OK?

3.10. Communicating about a new prescription: An example

Conversations about new prescriptions vary widely in the amount of information presented and discussed. In our dataset, no single physician-patient interaction about a newly prescribed medication included all of the conversational elements presented in the coding scheme. In addition, not all elements are pertinent for all medications. The following patient visit to an internist incorporates many of the information-giving behaviours that are desirable when prescribing a new medication (AHRQ). The patient is taking medications for diabetes and hypertension. At the beginning of the visit, the physician reviews the medications the patient is already taking by asking questions about names, dosages, dosing regimens, adherence and potential side effects or adverse reactions. These questions typically occur early in the history-taking process, though they can be asked at any point during the visit.

Since this patient's blood pressure was not controlled on his current regimen, the physician broached the potential need for a new medication:

DOC: Well, the only thing is about the blood pressure. It is still a bit too high. You know, it is about 160/80 in both arms. We should get it down lower ...

By stating that the patient's blood pressure is not controlled, this physician forecasted the possibility (Maynard 1996) that further intervention (in this case an additional medication) may be needed, while alluding to the blood pressure lowering purpose of the medication.

This physician used partnership-building in discussing the patient's need to achieve better blood pressure control. Studies have shown that patients want to discuss potential outcomes of treatment, especially when faced with conditions involving medical uncertainty (Frosch and Kaplan 1999). They also like to be offered choices and asked their opinions (Levinson *et al.* 2005). Statements of unity may convey a sense of joint ownership, and increasing patient participation in their medical care can contribute to improved patient medication adherence (Golin *et al.* 1996).

Following the initial suggestion for additional therapy to treat the patient's continued elevated blood pressure, the physician made a concrete recommendation to start an additional medication:

1	DOC:	Well (name), tell you what.
2		You are already taking captopril at
3		50 milligrams three times a day and
4		you are taking the water pill as well.
5		So, that is a good combination. And
6		your blood pressure is a bit lower
7		than it was last time. But I think
8		we are going to have add one other
9		tablet at night. And the one that I
10		would choose is called atenolol. It
11		is called a beta blocker and it tends
12		to be a very, very good medication.
13		The only problem with it, sometimes
14		it can make you less aware when you

15 are having low blood sugars, but I
 16 still think we can use for you if
 17 you would be willing to try it
 18 because it is tried and true. It
 19 has been around a long, long time,
 20 and it is very good for your heart.

21 PAT: Mm hm.

22 DOC: So, we will start out at a
 23 low dose, just 25-milligram tablet
 24 at nighttime. And then you and I
 25 should see each other back in about
 26 four to six weeks. Check back and
 27 see how you are doing.

(intervening conversation; 28 seconds)

28 DOC: Well, tell you what,
 29 everything else looks good, but
 30 I'm gonna add that one tablet at
 31 nighttime. Important that you
 32 take it at night.

33 PAT: Yeah.

34 DOC: Cuz I don't want it to get,
 35 get you dizzy during the morning.
 36 You know, we always have to be
 37 very ginger with medications for
 38 you.

39 PAT: I know, they won't let me go
 40 up the ladder anymore (laughter).

(intervening conversation; 60 seconds)

41 DOC: Okay, why don't you come
 42 back down here and you can put
 43 your shoes back on. We are going
 44 to keep everything the same except
 45 that one new tablet at nighttime
 46 we will add. Then we will get an
 47 appointment in about four to six
 48 weeks. Okay?

This sequence demonstrates the fulfilment of many components of medication communication, such as the specific name and medication class of the prescription, medication purpose and dose, number of tablets, frequency and timing of intake, common side effects, and follow-up instructions.

The physician recommendation for the new medication (lines 7–9) followed several statements conveying medication purpose that built on the forecasting statement made earlier in the visit, and was given in the context of instruction about the dosing regimen. This physician never explicitly stated that the new medication was for the patient's blood pressure. However, given the earlier statement about getting the blood pressure 'down lower', and the current context of

the conversation, which centres on the patient's other blood pressure medications (lines 1–5), the patient can infer that the new medication is being prescribed for hypertension. Subsequent patient comments and questions indicated appropriate patient understanding and interpretation of the discourse.

In this visit, directions for taking the medication are given by telling the patient about the number of tablets to take (one), and when to take it (at night). By instructing the patient to take the medication at night, the physician implies that it is to be taken once per day, therefore indirectly stating the frequency of medication intake. The exact name of the medication (atenolol) and the medication class (beta blocker) are given immediately after the directions.

The physician presents a potential medication side effect (lines 13–15), by both prefacing and following the statement with reassuring comments about the medication. The preceding comment about medication efficacy (lines 11–12) might boost the patient's confidence in the effectiveness of the medication. Subsequent remarks about the medication being 'tried and true' and about how it 'has been around a long, long time' may allay patient anxieties about medication safety in an era when news stories about medication adverse events are prevalent.

After introducing the potential medication side effect, the physician offered the patient an opportunity to express reservations about the medication, discuss potential obstacles, problems or concerns with taking the medication, or to reject it (lines 15–17). By acknowledging the physician's statements with a simple 'Mm hm', the patient forgoes his opportunity to object to the medication (Gardner 1997, 2001; Heritage and Sefi 1992; Stivers 2005, 2006).

Subsequently, the physician explained the specific medication dose (25 mg), gave an expression of relative dose (low dose), reiterated the timing of intake, and discussed the need to monitor medication efficacy in about 'four to six weeks'. After emphasizing the importance of taking the medication at night, the physician implicitly introduced another medication side effect (lines 34–35). Again, he followed the comment about the potential side effect with a statement of reassurance, and told the patient that the prescribing approach is 'very ginger' (lines 36–38). Though the conversation moved on to other topics, the physician revisited the topic of the new prescription towards the end of the visit by reiterating some direction-giving statements and the plans for monitoring medication efficacy. Such comments serve to emphasize important information and signal that the visit is nearing its end. Elements not touched upon during this visit include the expected duration of medication intake, the importance of medication adherence, and supply and refill information.

4. Discussion

The coding system developed in this study can be applied to physician–patient interactions to comprehensively describe the content of physician and patient communication about new medication prescriptions. Many of the codes substantiate those described in previous studies (Cockburn *et al.* 1987; Richard and Lussier 2006a; Scherwitz *et al.* 1985), yet this coding system goes beyond the existing literature to illustrate nuances in wording and explanations that may significantly impact patient understanding of the information discussed. The coding system also describes novel codes that are relevant to patient understanding of medication characteristics and use, and that can be used to examine interactions around new prescriptions.

We evaluated both primary care and cardiology visits to assess whether themes of discussion might differ by provider specialty. Providers of all specialties in this study discussed the same spectrum of topics, suggesting that a common framework may be used to evaluate new medication discussions across specialties.

Patients more attuned to the details of their medical care may achieve better health outcomes (Greenfield *et al.* 1985, 1988; Kaplan *et al.* 1989). Those possessing knowledge about the name and directions for use of a new medication could help avert medication errors due to misinterpretation of physician handwriting. Providers without access to patient records can provide better care if patients know the names, dosages and directions for their prescriptions. When multiple pills are to be taken or when the timing of medication intake is expressed in hourly increments, physicians might consider explicitly stating the frequency for taking the medication.

Patients receiving prescriptions for chronic diseases may not universally comprehend the need for continued medication use. Without discussions about duration of use, or of medication supply or refills, patients may not recognize the necessity to refill medications for chronic conditions. Furthermore, statements with vague quantifiers such as 'a long time' are open to interpretation, suggesting weeks to some and months or years to others.

The coding framework developed in this study can be used to assess both discussion content and physician–patient interactions. Though both physicians and patients should be actively involved in the prescribing process (Collins *et al.* 2005; Edwards and Elwyn 2001; Elwyn *et al.* 2003), shared decision making activities occur infrequently when medications are prescribed (Stevenson *et al.* 2000a). Yet more patient-centred activities can increase patient satisfaction, understanding of information and adherence (Hall *et al.* 1988).

This study has several limitations. All interactions were predicated upon a new medication being prescribed. Thus, encounters in which physician–patient negotiation precluded physicians from prescribing a medication were not captured. In addition, conversations occurring outside the examination room were not recorded. Since audiotaped interactions formed the basis of analysis, we were unable to capture non-verbal dimensions of communication. This limitation extends to the contents of any written communication given to the patient, unless explicitly verbalized during the office visit. The data were collected in 1999, and pre-date the use of electronic health records and e-prescribing systems. The majority of interactions and discussions concerning new prescriptions are unlikely to have changed, but in offices employing these systems, codes concerning written prescriptions may be obsolete. Furthermore, the coding system needs to be validated in future studies.

Over the past half-century, patients have demonstrated increasing interest in their treatments (Freidson 1970; Heath 1992; Peräkylä 1998; Robinson 2003; Shorter 1985). Medications are a major treatment modality, but evaluations of physician–patient conversations about newly prescribed medications have been inhibited by the lack of a comprehensive coding system designed to assess the nature and content of communication. These codes can be used to demonstrate physician fulfilment of recommended components of medication communication (AHRQ; Shrank *et al.* 2007), and to assess the impact of communication on patient adherence and clinical outcomes. Understanding such communication can elucidate core processes that may directly contribute to clinical outcomes. Interactions can be examined to determine the impact of patient question-asking and comments on new medication discussion content, and on the time spent discussing new prescriptions. Coding of different communication behaviours also can be used to inform the content of interventions to improve physician–patient communication concerning new medications.

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All quotations in this manuscript are unedited, and reflect the exact statements made by patients and physicians.

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Table 1

Studies of physician-patient communication about medications based on observations: Comparison of study design

Study Design	Study			
	Scherwitz <i>et al.</i> (1985)	Cockburn <i>et al.</i> (1987)	Richard and Lussier (2006)	Current Study
Setting	4 Community health centres; Hypertensive patients only	Community general practice offices	15 clinics	Group-model HMO Academic primary care network Academic cardiology practice
Specialty	11 total (family medicine, internal medicine)	56 general practice	40 general practice	16 family medicine 18 internal medicine 11 cardiology
# Patients	268 (219 new, 965 chronic, 103 changed meds)	201 (antibiotic prescriptions)	422 (250 new, 1242 other meds)	185 (243 new meds)
Race	68% black 20% Hispanic 12% white	No data (Australian)	No data (Canadian)	83% white

Table 2

Studies of physician–patient communication about medications based on observations: Comparison of coding systems

Themes	Scherwitz <i>et al.</i> (1985)	Cockburn <i>et al.</i> (1987)	Richard and Lussier (2006)	Current study
Forecasting medication need	No	No	No	Yes
Generic versus brand name	Yes	No	No	Yes
Dose	Yes	Yes	Coded as 'instructions for medication (dosage)'	Detailed description ^a
Number of pills or sprays	Yes	Coded as 'dosage schedules'	Coded as 'instructions for medication (dosage)'	Detailed description
Frequency of medication intake	Coded as "schedule"	Coded as 'dosage schedules'	Coded as 'instructions for medication (dosage)'	Detailed description
Timing of medication intake	Coded as 'schedule'	Coded as 'dosage schedules'	Coded as 'instructions for medication (dosage)'	Yes
Special instructions for use (e.g. with food, avoid alcohol)	No	No	Yes	Yes
Side effects	Yes	Yes	Yes	Detailed description
Medication safety	No	No	No	Yes
Adherence counselling	No	Yes	Yes	Yes
Direct-to-consumer advertising	No	No	No	Yes
Physician partnership building	No	No	Coded as 'physician asks patient's opinion of medication'	Detailed description
Written information given	No	No	No	Yes
Plans for monitoring medication	No	No	No	Yes
Patient request for medication	No	No	No	Yes
Patient resistance to new medication	No	No	Yes	Yes
Physician questions compliance with medication	Yes	No	Yes	No
Control of problem	Yes	No	Yes	No

^aNote: 'Detailed description' indicates that the code is described with greater level of detail.

Table 3Outline of select codes in order of common appearance during office visit^a

Review of medications the patient is already taking	Alternate uses for medication
Forecasting need for a new medication	Direct-to-consumer advertising/internet references
Prior history of medication use	Side effects/adverse events
New medication recommendation	Interactions with other medications or supplements
Assessment of medication allergies	Adherence counselling
Information giving	Onset of effect
Medication identification	Duration of effect
<i>Medication name</i>	Medication safety
<i>Medication appearance</i>	Medication efficacy
<i>Generic or brand name</i>	Medication strength
<i>Medication purpose or Justification for use</i>	Supply/refills
Directions	Contingency plans
<i>Medication dose</i>	Cost/insurance issues; patient ability to pay
<i>Number of pills or sprays</i>	Wrap-up
<i>Method of use</i>	Instructions about other medications patient may be taking
<i>Frequency of medication intake</i>	
<i>Timing of medication intake</i>	Getting prescription pad
<i>Duration of use</i>	Providing the prescription
<i>Regularity of use</i>	Providing written materials about medication
<i>Directions for using medications on an as needed basis</i>	Logistics of where to get medication, what to do with prescription
<i>When to start medication</i>	Plans for monitoring medication efficacy/side effects
<i>Special instructions (e.g. with food, avoid alcohol)</i>	
<i>Directions for adjusting medications</i>	
<i>Directions for equipment use (e.g. inhalers)</i>	

^a *Note:* This compressed list of codes excludes detailed descriptions of themes, interactional codes, and codes pertaining to patient initiation or negotiation around medication.