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## Communication about chronic pain and opioids in primary care: Impact on patient and physician visit experience

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### Abstract

Patients and physicians report that communication about chronic pain and opioids is often challenging, but there is little empirical research on whether patient-physician communication about pain affects patient and physician visit experience. This study video recorded 86 primary care visits involving 49 physicians and 86 patients taking long-term opioids for chronic musculoskeletal pain, systematically coded all pain-related utterances during these visits using a custom-designed coding system, and administered pre- and post-visit questionnaires. Multiple regression was used to identify communication behaviors and patient characteristics associated with patients' ratings of their visit experience, physicians' ratings of visit difficulty, or both. After adjusting for covariates, two communication variables—patient-physician disagreement and patient requests for opioid dose increases—were each significantly associated with both worse ratings of patient experience and greater physician-reported visit difficulty. Patient desire for increased pain medicine was also significantly positively associated with both worse ratings of patient experience and greater physician-reported visit difficulty. Greater pain severity and more patient questions were each significantly associated with greater physician-reported visit difficulty, but not with patient experience. The association between patient requests for opioids and patient experience ratings was driven by 2 visits involving intense conflict with patients demanding opioids. Patient-physician communication during visits is associated with patient and physician ratings of visit experience. Training programs focused on imparting communication skills that assist physicians in negotiating disagreements about pain management, including responding to patient requests for more opioids, likely have potential to improve visit experience ratings for both patients and physicians.

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## Keywords

opioid analgesics; chronic pain; communication; patient-physician relations; primary care; patient satisfaction

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## 1. INTRODUCTION

Chronic pain is among the most common complaints in primary care.[5,10] Patients and physicians report that clinic visits involving discussions about chronic pain are often difficult or unsatisfying,[25,27,40] particularly when visits involve discussions about opioid analgesics.[9,26] Physicians report difficulty communicating with “narcotic-seeking” patients who request higher opioid doses,[3,30] while patients often report that physicians do not appreciate their plight or take their pain seriously.[40]

Identifying patient-physician communication patterns associated with patient and physician visit experience is an important step towards characterizing best practices for communicating about chronic pain and opioids. However, most research on communication about pain and visit experience relies on participant recall, and is thus subject to the limitations of human memory and emotion.[14,35] Ideally, such research should include observational data from actual patient-physician interactions, which is the gold standard for this line of investigation.[16] As a result of over-reliance on recall, we know little about the extent to which *actual* communication about pain during visits (as opposed to recollections) is associated with patients’ and physicians’ experiences of care.

Understanding these relationships has assumed greater urgency as physicians find themselves caught between two policy developments. First, health insurers, including Medicare, are increasingly basing reimbursement on patients’ ratings of their health care experience.[2] In the context of chronic pain, some physicians complain that this approach produces pressure to prescribe opioids to high-risk patients to avoid conflict and maintain high patient experience scores.[24,43] Second, growing evidence of serious opioid-related harms (without corresponding evidence of clinical effectiveness) has prompted recent dramatic shifts in clinical guidelines that discourage the routine use of opioids to treat chronic pain.[6] These shifts may make negotiations around opioids even more difficult as physicians recommend that patients on long-term opioids taper down to lower, safer doses.

In this study, we analyzed video-recorded primary care clinic visits involving patients on long-term opioids for chronic musculoskeletal pain and then systematically coded communication during these visits to identify associations among patient characteristics and attitudes related to pain, communication during visits, patient experience, and physician-reported visit difficulty. Our analysis focused on discussions of pain and opioid prescribing. Findings from this study can be used to inform design of communication-based interventions and training programs aimed at improving patient-physician communication about chronic pain and opioids, while also promoting safe opioid prescribing.

## 2. METHODS

### 2.1 Conceptual approach and variable selection

Our analysis was guided by the presumption that both patient experience and physician-reported visit difficulty are influenced by communication during visits and by patient characteristics and attitudes related to pain (including desire for increased pain medicine). Patient characteristics and attitudes related to pain are also likely to influence communication during visits. No studies have examined the extent to which patient characteristics and patient-physician communication predict patient and physician visit experience in the context of chronic pain. We analyzed patient characteristics likely to be associated with visit experience that are not directly related to pain (i.e., demographics, history of substance use disorder) as covariates.

To examine these associations, we developed the Chronic Pain Coding System (CPCS),[12] an utterance-by-utterance coding system designed to capture pain-related communication behaviors likely to be associated with ratings of patient experience, physician-reported visit difficulty, or both. Table 1 defines the communication variables derived from CPCS that were used in our statistical analysis. We hypothesized that both patient-physician disagreement and patient requests for opioid dose increases would be associated with both worse patient experience and greater physician-reported visit difficulty. We also hypothesized that patients' baseline pain severity and desire for increased pain medicine would be associated with worse patient experience and greater physician-reported visit difficulty.

### 2.2. Study design and participants

Primary care visits for this observational study were scheduled independent of the research study; data collection protocols were designed to minimize effects on clinic workflow and patient-physician communication. Patients and physicians were recruited from two academic primary care clinics at the University of California, Davis Medical Center in Sacramento, California. Eligible physicians were internal medicine or family medicine residents who saw primary care patients at one of the study clinics and—to assure attainment of a relatively stable practice style—had completed 1 year of training. Eligible patients were established adult patients who were prescribed long-term opioids (i.e., 1 opioid dose per day for 90 days) for chronic musculoskeletal pain by their primary care physician, reported at least moderate pain intensity, and planned to discuss pain management during a scheduled appointment with an enrolled physician (see screening questions below). Patients were ineligible if they were getting active cancer treatment or palliative care, spoke a language other than English during clinic visits, or were being prescribed opioids by someone other than their primary care physician. The University of California, Davis Institutional Review Board approved this study.

### 2.3 Recruitment and data collection

Physicians were recruited through email invitations and clinic presentations. Patients were recruited by reviewing clinic schedules of enrolled physicians to identify potentially eligible patients. A research assistant contacted potentially eligible patients by either approaching

them in clinic waiting rooms or mailing a letter describing the study followed by a telephone call. For each contacted patient, the research assistant confirmed eligibility and then asked the following visit-specific screening questions in order to identify visits for which pain management would be a substantive topic of discussion:

1. How would you rate your average pain over the past week, with zero being no pain and 10 being the worst pain possible?
2. At your upcoming visit, how likely are you to talk about ways to get better control of your pain? (1-very unlikely to 5-very likely)
3. At your upcoming visit, how likely are you to talk about changing the dose or type of your pain medicine? (1-very unlikely to 5-very likely)

Patients were eligible to enroll if they rated their pain as 4 and answered “likely” or “very likely” to either question 2 or 3. Interested patients who reported being unlikely to discuss pain management were re-screened prior to subsequent appointments. Patients could only participate in a single visit, while enrolled physicians could participate in multiple visits.

Physicians completed a baseline questionnaire at enrollment and a post-visit questionnaire immediately after each study visit. Patients completed questionnaires immediately before and after their study visits. Prior to each visit, the research assistant set up a handheld video camera in the exam room to record the clinic visit. Separate audio recordings were also collected as back up. The research assistant waited outside of the exam room during the visit and collected the recorders after each visit. Physicians and patients were given the option of covering the camera to exclude sensitive physical exam maneuvers. Visits were recorded between November 2014 and January 2016.

## 2.4. Measures

**2.4.1. Baseline measures**—At enrollment, physicians provided demographic information and answered 6 items to assess their perceptions of opioid effectiveness for chronic musculoskeletal pain adapted from the perceived effectiveness subscale of the Clinicians’ Attitudes and Beliefs about Opioids Survey.[42] This subscale has been associated with physician intent to prescribe opioids.[38]

In addition to demographic information, patient pain severity was assessed using the PEG, a 3-item scale that performs well in primary care compared to longer measures.[20,22] Patients’ desire for increased pain medicine was measured by the item, “Do you want the doctor to increase your pain medication today?” (1-“definitely not” to 5-“definitely yes”). Pain catastrophizing was measured using the catastrophizing subscale from the Coping Strategies Questionnaire.[33] Risk for opioid misuse was assessed using the 5-item Screener and Opioid Assessment for Patients with Pain (SOAPP-SF).[19] Physical and mental health were assessed using the Veterans RAND 12-item Health Survey (VR-12), a non-proprietary version of the SF-12.[34] Responses to the VR-12 were used to calculate physical health component scores (PCS) and mental health component scores (MCS). PCS and MCS range from 0 to 100 (with 100 indicating perfect health) and have been benchmarked against nationally representative surveys.[34]

**2.4.2. Post-visit measures**—Physicians completed the 10-item Difficult Doctor-Patient Relationship Questionnaire immediately after each visit.[11] Physician-reported visit difficulty has been associated with worse patient satisfaction, greater symptom burden, and higher healthcare utilization.[15,17]

Patient post-visit questionnaires included four measures about their experience during the visit. Agreement with treatment plan was assessed using a 3-item scale developed by Staiger et al. that independently predicted long-term health outcomes in a previous study of patients with low back pain.[36] Appraisal of physicians' communication skills was assessed using 6 items from the Consumer Assessment of Healthcare Providers and Systems (CAHPS) Adult Visit Survey.[8] Trust in physician was assessed using the short form of the Wake Forest trust in physician scale.[7] Assessment of visit difficulty was assessed by rewording 5 items from the Difficult Doctor-Patient Relationship Questionnaire to assess the patient's perception of visit difficulty. These 4 patient-reported measures were all highly correlated (mean  $|r| = 0.79$ , range 0.70 to 0.85). Exploratory factor analysis (including examination of eigenvalues and scree plots) indicated that all 4 measures assessed a single latent construct. Therefore, we combined all 4 measures into one standardized composite variable called "patient experience." [28] Patients also reported whether the visit was with their usual primary care physician and estimated the number of previous visits with the physician they saw.

**2.4.3. Patient-physician communication**—Patient-physician communication about pain during each visit was coded using the Chronic Pain Coding System (CPCS). Development and validation of CPCS has been described previously.[12] Written transcripts were initially divided into utterances—segments of speech that express a complete thought—for further analysis. Thereafter, two trained coders independently classified each utterance as either pain-related or not pain related, and resolved disagreements through discussion. Inter-coder agreement for identifying pain-related utterances was "substantial" ( $K = 0.71$ ), as defined by Landis and Koch.[23] Once identification of pain-related utterances had been finalized, the same two trained coders independently assigned each pain-related utterance to one or more coding categories. Coders watched video recordings during this final step to more accurately code individual utterances by taking into account nuances and nonverbal communication not captured in transcripts. Disagreements between coders were resolved through discussion. CPCS coding categories were captured both general communicative processes (e.g., patient requests, physician patient-centered communication) as well as more detailed subcategories for communication about opioids. For patient requests and physician recommendations, CPCS captured the other person's initial response (i.e., agree, disagree/resist, suggest an alternative, or no response). Agreement for coding subcategories was generally "moderate" ( $K = 0.4 - 0.6$ ), [23] while agreement for major coding categories was generally moderate to substantial ( $K = 0.5 - 0.7$ ). Two coders independently coded every transcript and discussed all discrepancies, so effective reliability of the final data used for analysis is higher than would be suggested by the kappa statistics. A complete list of the CPCS coding categories and item-specific kappa statistics are available from the corresponding author.

**2.4.4. Chart abstraction**—Data from patients’ electronic medical records were manually abstracted by a trained research assistant. One author (SGH) independently abstracted records for 23% of patients in order to check abstraction accuracy; he also reviewed and adjudicated ambiguous cases. Data abstracted included pain location, common physical, mental health, and substance use diagnoses (documented either during or prior to the study visit), and patients’ baseline daily opioid dose measured in morphine milligram equivalents. [32]

## 2.5 Statistical analyses

We initially performed a descriptive analysis of the coded communication variables to characterize the content of communication about pain during study visits. To explore whether patient-physician disagreement was more common for opioids than for other pain-related topics, we also examined physicians’ initial responses to patient requests that physicians take some action and patients’ initial responses to physician recommendations, and compared responses related to opioids versus responses that were not related to opioids.

We then examined associations with our two dependent variables, patient and physician experience. We conducted separate analyses for each dependent variable. For each dependent variable, we first examined bivariate associations between patient characteristics and communication variables and the dependent variable, and then repeated analyses controlling for patient demographics (age, sex, white race) and whether or not the patient had a current or prior substance use disorder diagnosis. Communication variables were analyzed as count variables (i.e., the number of times a code occurred per visit). We controlled for clustering by physician using generalized estimating equations with robust standard errors, because estimates using this method are less susceptible to influence by outlier values.[1] Due to the skewness of patient experience ratings, we repeated analyses for patient experience using generalized linear models with a log link.[29] Results were not substantially different than those of our primary analysis and so are not discussed further.

Inspection of study data revealed 3 outlier visits that had very poor ratings for patient experience and high ratings for visit difficulty (Figure 1). Review of visit recordings revealed that 2 of these 3 visits were dominated by intense patient-physician conflict involving patients demanding opioids. These 2 visits were also outliers on at least one important independent variable (either patient-physician disagreement or patient requests for opioid dose increase). Based on guidelines for handling statistical outliers,[1] we conducted analyses both with and without these 2 interesting cases. The third outlier involved a patient upset about a prior clinic visit. We kept this visit in the analysis because it contained only a brief discussion of opioids and pain and was not an outlier in terms of independent variables.

## 3. RESULTS

### 3.1. Recruitment and participant characteristics

Seventy-five percent of eligible physicians agreed to enroll. Of the 90 enrolled physicians, 49 saw 1 study patient and so were included in the final sample. The research assistant contacted and screened 194 patients and identified 134 eligible patients. Of the 60 ineligible

patients, 25 reported well-controlled pain and did not plan to discuss pain management or opioid dosing during their upcoming visit, 10 were not taking opioids, 9 took opioids prescribed by specialists, 6 did not speak English, 5 were receiving active cancer treatment, and 5 were no longer followed at the study clinic. Thus, only 16% (25 of 159) of otherwise eligible patients were excluded because they reported well-controlled pain. Eighty-four percent of eligible patients (113 of 134) were willing to enroll and 87 actually enrolled. The remaining 26 patients were unable to enroll due to scheduling conflicts (e.g., cancelled visits). One visit was not recorded due to technical problems, leaving a final sample of 86 visits. Eight-six percent of patients reported that the study visit was with their primary care physician, and 92% reported at least one prior clinic visit with the physician they saw during their study visit.

Table 2 describes patient and physician characteristics. Only 13% of patients reported working full or part time; 52% described themselves as unable to work. The median annual household income was between \$10,001 and \$20,000. Patients reported substantially worse physical and mental health than the general population. Median PCS was 22.8, which is 1.5 standard deviations worse than the U.S. median PCS of 40.7.[34] Median MCS was 37.7, which is 1.3 standard deviations worse than the U.S. median MCS of 53.1. Patients' mean pain severity was 7.6. Based on chart review, patients had a median of 2 different pain sites. The most common pain locations were back (73%), lower limb (55%), upper limb (36%) and neck (20%). A substantial proportion of patients had mental health diagnoses, especially depression (54%) and anxiety (34%). Forty percent of patients had a current or prior substance use disorder (excluding tobacco). Patients' median prescribed opioid dose was 42.5 morphine milligram equivalents per day; 23% of patients were prescribed both opioids and benzodiazepines. Physician perceived opioid effectiveness was normally distributed with a mean of 15.6 (SD 3.3). This variable was not significantly associated with either of our dependent variables, and so is not discussed further.

### 3.2. Patient-physician communication

Based on the percent of total utterances coded as pain-related, patients and physicians spent a mean of 52% of their total visit (range 8% to 90%) discussing pain and pain management. Table 1 shows the median codes per visit for each the communication variables derived from CPCS. On average, patients made a mean of 5.2 (median 3) requests for some physician action related to pain management (e.g., refill a medication, place a referral) and asked a mean of 5.7 (median 4) pain-related questions. Physicians made a mean of 15.5 pain-related recommendations (median 14) per visit. Patient negative assessments of pain (defined as patient statements indicating negative emotions due to pain, pain-related functional limitation, or worsening pain) were common. Patients made a mean of 8.8 (median 7) negative assessments of pain per visit; 92% of visits included at least one patient negative assessment. On the other hand, all visits in our sample contained at least one instance physician patient-centered communication (defined as physicians eliciting patient perspectives on pain or pain management or making supportive, empathetic statements about pain). Physicians made a mean of 12.8 (median 11) such statements per visit.



Of the 42% (n = 36) of patients who indicated a probable or definite desire for increased pain medicine (Table 2), half (n = 18) subsequently requested an opioid dose increase during their visit. Patients requested an opioid dose increase in 26% of visits (n=22), so only 8% of patients (4 out of 50) who did not indicate a desire for increased pain medicine subsequently requested an opioid dose increase. Eight visits included multiple (i.e. repeated) requests for opioid dose increases. In contrast, physicians recommended opioid dose decreases in 44% of visits (n = 38). As shown in Table 3, there was no substantive difference in the distribution of responses for opioid-related and non opioid-related topics. Overall, physicians initially agreed to 31% of all patient requests, whereas patients initially agreed to 55% of physician recommendations. Physician recommendations were nearly 3 times more common than patient requests (1331 versus 447); however, only 14% of all physician recommendations were related to opioids, compared to 37% of all patient requests (see Table 3).

Review of the 2 outlier visits marked by intense patient-physician conflict revealed that both cases involved patients with substance use disorders who came to clinic to demand opioids. In one visit, the patient's usual physician refused to prescribe additional opioids because the physician had discovered that the patient was getting methadone for opioid use disorder but had not disclosed this fact to the physician or clinic. This visit contained the most coded instances of patient-physician disagreement (n = 26) and the second most coded patient requests for physician action (n = 26) and discussions of opioid risks (n = 13) in our sample. It also included 8 coded instances of the patient threatening to change physicians or obtain illicit drugs if the physician did not prescribe opioids. Only 1 other instance of such a patient threat was coded in our entire sample, and in that instance the patient clarified that the threat was meant as a joke. In the second outlier visit, the patient had been denied an opioid refill because the patient's urine drug screen had tested positive for methamphetamine for the second time, though the patient denied recent methamphetamine use. This visit contained the most coded instances of patient requests for opioid dose increases (n = 11) and the second most patient questions (n = 27) and discussions of opioid risks (n = 13; tied with the other outlier visit) in our sample. Neither of these 2 patients received an opioid prescription during the visit.

### 3.3. Patient and physician experience ratings

Distribution of patient experience ratings showed a marked negative skew (range -3.39 to 0.65, median = 0.39, interquartile range -0.14, 0.61), with 22% of patients reporting the best possible experience score. This distribution is consistent with the ceiling effect commonly seen in patient experience ratings.[8] Physician-reported visit difficulty scores were normally distributed, with a mean of 27.5 (SD 10.6). Physicians rated 41% of visits as difficult (defined as a visit difficulty score  $\geq 30$ ) compared to the 15–18% prevalence of difficult visits found in studies of general primary care visits.[11,15] Ratings of patient experience and visit difficulty were moderately negatively correlated ( $r = -0.54$ , see Figure 1).

### 3.4. Predictors of patient experience

Table 4 shows statistical analysis results for patient experience. Patient age was the only demographic covariate included in our final analyses, because neither sex nor race was

significantly (or almost significantly) associated with the primary independent or dependent variables analyzed. Among the communication variables examined, patient requests for increased opioids, patient-physician disagreement, and length of discussion about opioid risks and side effects were each associated with significantly worse patient experience ratings in adjusted analyses. However, only the association with patient-physician disagreement remained significant when the two outlier visits were omitted. In particular, the association between patient requests for increased opioid doses and patient experience was wholly due to the 2 outlier visits. Neither physician recommendations for decreased opioid doses nor physician patient-centered communication were significantly associated with patient experience ratings (in either bivariate or adjusted analyses). Among the patient characteristics examined, greater desire for increased pain medicine doses and higher risk of opioid misuse (as measured by SOAPP-SF scores) were associated with significantly worse patient experience ratings. However, only the association with desire for increased pain medicine remained significant when the 2 outlier visits were omitted. Patients' self-reported physical or mental health and pain severity were not significantly associated with patient experience ratings in adjusted analyses.

To summarize, only two variables—patient-physician disagreement and patient desire for increased pain medicine—were consistently and significantly associated with patient experience ratings. For several other variables, including actual patient requests for opioid dose increases and risk of opioid misuse, associations with patient experience were significant and were driven by 2 highly contentious outlier visits.

### 3.5. Predictors of visit difficulty

Table 5 shows statistical analysis results for physicians' ratings of visit difficulty. After adjusting for covariates, patient requests for increased opioids, patient-physician disagreement, patient requests for information (i.e., questions) and patient negative assessments of pain (i.e., patient statements indicating negative emotions or functional limitations related to pain) were each significantly associated with more difficult visits. Among the patient characteristics examined, greater pain severity and desire for increased pain medicine were both significantly associated with more difficult visits. All these associations remained significant when the 2 outlier visits were omitted. Thus, in addition to patient desire for increased pain medicine, the same 2 communication variables associated with patient experience ratings—patient-physician disagreement and patient requests for increased opioid doses—were also significantly associated with physician ratings of visit difficulty in the expected direction. In contrast to results for patient experience, pain severity and several other patient communication variables, including patient requests for information (i.e., questions) and negative assessments of pain, significantly predicted visit difficulty ratings in adjusted analyses.

## 4. DISCUSSION

We examined associations between patient-physician communication about chronic pain and patient and physician visit experience using data from actual primary care clinic visits involving patients taking opioids for chronic musculoskeletal pain. Patient-physician

disagreement and patient requests for opioid dose increases were associated with significantly worse ratings of both patient experience and physician-reported visit difficulty. In addition, visits with patients who reported greater desire for increased pain medicine resulted in significantly worse ratings of both patient experience and physician-reported visit difficulty. Our study is the first to quantitatively analyze associations between observed communication about pain, patient and physician ratings of visit experience, and patient characteristics, and does so for a patient population that is commonly identified with poor visit experience ratings and unproductive communication.

Analysis of patient-physician communication (as coded by the CPCS) indicates that patients and physicians in our sample spent just over half of their total visit discussing pain and pain management, and that these visits typically included a large number of patient requests and physician recommendations related to pain and pain management (Table 1). These findings suggest that our recruitment strategy successfully captured primary care visits that included substantive discussions of chronic pain management and opioids. Our finding that patients who indicated a desire for increased pain medicine tended to request an opioid dose increase during their visit makes intuitive sense and suggests that our coded communication variables were valid measures of patient-physician communication. Of course, some patients who desired increased pain medicine may have desired an increase in non-opioid medication. Surprisingly, we found no evidence that patients or physicians were more likely to resist or disagree with opioid-related requests and recommendations as compared to pain-related requests and recommendations that did not involve opioids.

Though additional confirmatory studies are needed, it is not surprising that more frequent patient-physician disagreement about pain management is associated with worse visit experience ratings from both patients and physicians. In addition, our findings suggest that, consistent with conventional wisdom, patient requests for opioid dose increases are associated with both worse patient experience ratings and greater physician-reported visit difficulty. At the same time, these associations are driven either in part (for visit difficulty) or wholly (for patient experience) by 2 outlier visits involving intense conflict with high-risk patients demanding opioids. In-depth analysis of these two visits revealed that they were unusual both in terms of patient risk (i.e. both patients had obvious substance use disorders and were not completely forthcoming with their physicians) and in terms of several independent communication variables (e.g., requests for opioid dose increases, patient-physician disagreement, discussion of opioid risks). Thus, these visits were both clinical and statistical outliers compared to the rest of the sample.

Physicians frequently bemoan visits involving these kinds of stereotypical “narcotic-seeking” patients, [3,27] yet they comprised only 2% (95%CI 0 – 8%) of our sample. Even accounting for the uncertainty in our estimate, our data suggests that fewer than 10% of primary care visits with patients taking long-term opioids involve marked conflict over opioids. Physicians may over-estimate the frequency of these intensely difficult interactions due to availability bias; such visits are much more salient than routine interactions.[39] The high salience of interactions with combative patients likely contributes to the stigma attached to both chronic pain and opioid use.[4,31] The possible availability bias due to the

high salience of these interactions is parallel to their outsize statistical influence in our quantitative analyses.

While several variables were associated with both worse patient experience and greater physician-reported visit difficulty, we also found notable differences. Overall, physician experience ratings were associated with a wider range of patient characteristics and communication variables than patient experience ratings, especially when the 2 outlier visits were not considered. Greater pain severity was significantly associated with physician perceptions of greater visit difficulty, but not with worse patient experience ratings. Patients who suffer from chronic pain may adapt to their pain over time, so that pain severity has little impact on ratings of their health care experience. In addition, higher intensity ratings for chronic pain may reflect emotional and psychosocial factors that are also associated with more difficult visits.[37] The findings that worse mental health status and greater pain catastrophizing are both significantly associated with visit difficulty in bivariate analyses are consistent with this explanation. Patient questions and patient negative assessments of pain (i.e., patient statements indicating negative emotions or functional limitations related to pain) were also associated with greater physician-reported visit difficulty, but not worse patient experience ratings. These findings may reflect physicians' inherent disfavor for patient questions during clinic visits[41] and the challenges of managing patients' emotional reactions to pain, respectively.

This observational study has several limitations. The small sample size and clustered design limit our ability to investigate interactions among different variables or physician characteristics, respectively, though we did measure physician attitudes about opioid effectiveness. Our sample size reflects the challenges inherent in recruiting the sub-population of primary care patients taking opioids for chronic pain for specific visits where pain is discussed. The effect sizes observed in our analyses were small; however, our communication variables indicate utterance counts, so it would not be clinically plausible for a single additional utterance to result in large changes in visit experience ratings. Highly dissatisfied, "narcotic-seeking" patients may have been less likely to enroll in this study. On the other hand, our recruitment procedures were designed to screen out visits with patients who were satisfied with their pain management and so did not plan to discuss pain or opioid medication. Based on our recruitment data, our results are likely applicable to the majority of primary care patients taking opioids for chronic musculoskeletal pain. We cannot rule out the possibility that being video recorded may have influenced patient-physician communication, though existing research on the effects of audio and video recording on patient-physician communication has not documented clinically meaningful Hawthorne effects.[13] Finally, our sample was restricted to resident physicians at two academic primary care clinics, and so may not generalize to other populations. In particular, prior studies have found that less experienced and younger physicians tend to rate visits as more difficult.[15,21]

Physicians have long asserted that effective communication is important for chronic pain management and opioid prescribing. This study shows that patient-physician communication—specifically disagreements and requests for more opioids—does impact patient and physician ratings of visit experience. Given these findings, interventions and training

programs focused on imparting communication skills that assist physicians in negotiating disagreements about pain management, including responding to patient requests for more opioids, likely have potential to improve visit experience ratings for both patients and physicians. Programs that deliver context-specific learning and hands-on practice, such as high-fidelity simulation or standardized patient-based instruction[18], seem particularly promising for helping physicians to build communication skills for navigating putatively difficult topics such as opioids and chronic pain. In addition, physicians would likely benefit from specific training on how to recognize and communicate with high-risk, “narcotic-seeking” patients exemplified by the outlier visits in this study.

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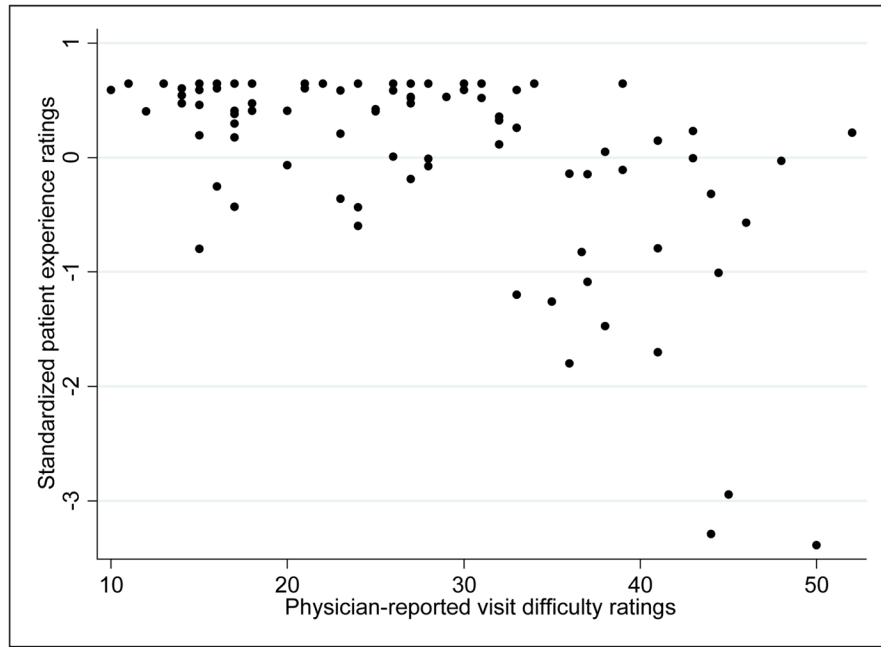
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**Figure 1.**  
Scatter plot of patient experience versus physician-reported visit difficulty

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Table 1

Variables derived from the Chronic Pain Coding System used in analysis

<b>Patient communication</b>	<b>Definition</b>	<b>Examples</b>	<b>Codes per visit Median (IQR)</b>
Request for opioid dose increase	Patient asks for an increased opioid dose	"I mean, one every 12 [hours] was not cutting it"	0 (0, 1)
Request for information	Patient question related to pain	"Is that arthritis?"	4 (1, 7)
Request that physician take some action	Patient request that patient take some action related to pain management	"I don't have any gabapentin anymore" "You could give me the Norco or the Percocet"	3 (2, 7)
Negative assessment of pain	Statement indicating negative emotion due to pain, pain-related functional impairment, or worsening pain	"[the pain] is making me crazy, driving me insane" "I can't walk, I can't do anything"	7 (3, 13)
<b>Physician communication</b>			
Recommendation for decreased opioid dose	Physician recommends a lower opioid dose	"So, we could go MSContin down to 90"	0 (0, 1)
Patient-centered communication	Physician elicits patient perspective on pain or pain management, or makes supportive/empathetic statements about pain	"Is the referral to surgery something you want?" "Okay, you're gonna get through this."	11 (7, 16)
<b>Patient-physician communication</b>			
Patient-physician disagreement	Patient disagreement with physician recommendation or physician denial of patient request related to pain	"let's try not to use it" "that really doesn't work, either"	1 (0, 2)
Discussion of patients' opioid-related risks	Patient and physician statements about opioid-related risks or side effects	"these medications can be addicting" "it made me so sick and nauseous"	3 (1, 5)

IQR = interquartile range

**Table 2**

## Participant Characteristics

<b>Demographics</b>	<b>Patients (n = 86)</b>	<b>Physicians (n = 49)</b>
Age, mean (SD)	59.6 (10.5)	29.6 (3.6)
Male sex, n (%)	31 (36.1%)	12 (24.5%)
Hispanic, n (%)	12 (14.0%)	1 (2.0%)
<b>Race, n (%)</b>		
White	56 (65.1%)	24 (49.0%)
Black	24 (27.9%)	2 (4.1%)
Asian	0 (0%)	21 (42.9%)
Native American	2 (2.3%)	0 (0%)
Multi-race / other	4 (4.7%)	2 (4.1%)
<b>Clinic, n (%)</b>		
Family practice	23 (26.7%)	12 (24.5%)
Internal medicine	63 (73.3%)	37 (75.5%)
<b>Employment status, n (%)</b>		
Working	11 (12.8%)	
Not working / unemployed	1 (1.2%)	
Retired	30 (34.9%)	
Disabled / unable to work	44 (51.2%)	
<b>Education, n (%)</b>		
Did not finish high school	15 (17.4%)	
High school graduate	16 (18.6%)	
Some college	30 (34.9%)	
Associates / technical degree	11 (12.8%)	
Bachelor's degree	14 (16.3%)	
<b>Annual household income<sup>a</sup>, n (%)</b>		
\$10,000	21 (24.4%)	
\$10,001 – \$20,000	30 (34.9%)	
\$20,001 – \$60,000	18 (20.9%)	
> \$60,000	16 (18.6%)	
<b>Patient characteristics</b>		
<b>Health status, mean (SD)</b>		
VR-12 Physical component score <sup>b</sup>	24.3 (7.7)	
VR-12 Mental component score <sup>b</sup>	38.7 (11.6)	
<b>Pain severity (PEG), mean (SD)</b>	7.6 (1.8)	
<b>SOAPP-SF score, mean (SD)<sup>c</sup></b>	4.6 (2.9)	
<b>Pain catastrophizing, mean (SD)<sup>d</sup></b>	16.3 (7.9)	
<b>Current or past substance use diagnosis, n (%)<sup>e</sup></b>	34 (39.5%)	
<b>Desire for increased pain medicine, n (%)</b>		
Definitely not	12 (14.0%)	

Demographics	Patients ( <i>n</i> = 86)	Physicians ( <i>n</i> = 49)
Probably not	23 (26.7%)	
Not sure	15 (17.4%)	
Probably yes	17 (19.8%)	
Definitely yes	19 (22.1%)	

<sup>a</sup> one missing value

<sup>b</sup> Veterans SF-12, range 0–100; higher values indicate better health

<sup>c</sup> Screener and Opioid Assessment for Patients with Pain Short Form, range 0–20; higher values indicate greater risk

<sup>d</sup> assessed using Coping Strategies Questionnaire subscale, range 0–36; higher values indicate greater catastrophizing

<sup>e</sup> assessed from chart review; defined as current or prior illegal drug use, prescription drug abuse, alcohol abuse as well as current marijuana use

**Table 3**

Initial responses to physician recommendations and patient requests that physicians take some action

Response*	Patient initial response to physician recommendations		Physician initial response to patient request for action	
	Not opioid related	Opioid related	Not opioid related	Opioid related
Agree	627 (55.0%)	110 (57.9%)	93 (32.98%)	44 (26.7%)
Suggest alternative	6 (0.5%)	4 (2.1%)	20 (7.1%)	16 (9.7%)
Resist or disagree	58 (5.1%)	15 (7.9%)	40 (14.2%)	30 (18.2%)
No response	450 (39.4%)	61 (32.1%)	129 (45.7%)	75 (45.5%)
Total	1141 (100%)	190 (100%)	282 (100%)	165 (100%)

\* Responses are classified based on the initial response to each recommendation and request, and do not necessarily indicate whether the recommendation or request was ultimately agreed to or not. The category "no response" indicates that no response to a recommendation or request was identified during the coding process.

Table 4

Associations between pain-related variables and patient experience ratings<sup>a</sup>

Communication during visits	Bivariate analysis <sup>b</sup>			Adjusted analysis <sup>c</sup>		
	Coefficient	95% CI	P-value	Coefficient	95% CI	P-value
Patient requests for increased opioid dose	-0.23 <sup>d</sup>	-0.34, -0.11	<0.001	-0.21 <sup>d</sup>	-0.32, -0.09	<0.001
Patient requests for information	-0.02	-0.07, 0.03	0.38	-0.02	-0.06, 0.02	0.35
Patient requests that physicians take some action	-0.04	-0.09, 0.02	0.24	-0.03	-0.09, 0.03	0.40
Patient negative assessment of pain	-0.01	-0.04, 0.01	0.32	-0.01	-0.03, 0.01	0.26
Physician recommendation for opioid dose decrease	0.01	-0.05, 0.07	0.70	0.03	-0.03, 0.08	0.34
Physician patient-centered communication	0.00	-0.03, 0.02	0.75	0.00	-0.03, 0.02	0.84
Patient-physician disagreement	-0.13	-0.16, -0.09	<0.001	-0.12	-0.16, -0.09	<0.001
Length of discussion of opioid risks and side effects	-0.09 <sup>d</sup>	-0.17, -0.01	0.03	-0.08 <sup>d</sup>	-0.15, -0.01	0.04
<b>Patient characteristics</b>						
Pain severity	-0.04	-0.12, 0.03	0.27	-0.02	-0.10, 0.05	0.52
Pain catastrophizing	-0.01	-0.03, 0.00	0.16	0.00	-0.02, 0.02	0.92
Risk of opioid misuse	-0.09	-0.14, -0.03	0.002	-0.07 <sup>d</sup>	-0.12, -0.01	0.03
Desire for increased pain medicine	-0.18	-0.31, -0.05	0.007	-0.17	-0.29, -0.05	0.007
VR-12 mental component score	0.01 <sup>d</sup>	0.00, 0.02	0.05	0.01	-0.004, 0.02	0.24
VR-12 physical component score	-0.01	-0.04, 0.01	0.33	-0.01	-0.04, 0.01	0.22

<sup>a</sup> standardized patient experience variable, with higher values indicating better experience<sup>b</sup> controlled only for clustering (generalized estimating equations)<sup>c</sup> controlled for clustering, age, and whether patient had documentation of substance use disorder<sup>d</sup> results no longer significant ( $P < 0.05$ ) after removing 2 outliers that involve major opioid-related conflict

Table 5

Associations between pain-related variables and physician-reported visit difficulty<sup>a</sup>

Communication during visits	Bivariate analysis <sup>b</sup>			Adjusted analysis <sup>c</sup>		
	Coefficient	95% CI	P-value	Coefficient	95% CI	P-value
Patient requests for increased opioid dose	2.28	1.21, 3.35	<0.001	1.83	0.87, 2.79	<0.001
Patient requests for information	0.54	0.22, 0.86	0.001	0.51	0.25, 0.76	<0.001
Patient requests that physicians take some action	0.41	-0.01, 0.82	0.06	0.22	-0.19, 0.64	0.29
Patient negative assessment of pain	0.31	0.05, 0.58	0.02	0.31	0.10, 0.53	0.004
Physician recommendation for opioid dose decrease	0.32	-0.38, 1.01	0.37	0.11	-0.67, 0.88	0.79
Physician patient-centered communication	-0.02	-0.28, 0.25	0.91	-0.03	-0.26, 0.20	0.80
Patient-physician disagreement	0.90	0.56, 1.23	<0.001	0.71	0.39, 1.03	<0.001
Length of discussion of opioid risks and side effects	0.76 <sup>d</sup>	0.08, 1.45	0.03	0.60	-0.06, 1.26	0.07
<b>Patient characteristics</b>						
Pain severity	1.87	0.79, 2.95	0.001	1.59	0.57, 2.62	0.002
Pain catastrophizing	0.37	0.09, 0.66	0.01	0.24	-0.02, 0.50	0.07
Risk of opioid misuse	0.81 <sup>d</sup>	0.00, 1.63	0.05	0.03	-0.79, 0.85	0.94
Desire for increased pain medicine	2.56	1.22, 3.89	<0.001	2.31	1.03, 3.59	<0.001
VR-12 mental component score	-0.19	-0.36, -0.02	0.03	-0.14	-0.30, 0.03	0.10
VR-12 physical component score	-0.11	-0.46, 0.24	0.54	-0.09	-0.41, 0.24	0.60

<sup>a</sup> difficulty ratings range from 10–60, with higher values indicating greater difficulty<sup>b</sup> controlled only for clustering (generalized estimating equations)<sup>c</sup> controlled for clustering, age, and whether patient had documentation of substance use disorder<sup>d</sup> results not significant ( $P < 0.05$ ) after removing 2 outliers that involve major opioid-related conflict