Understanding physicians’ imaging test use in low back pain care: the role of focus groups

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Abstract

Objective. To gain understanding about why a controlled intervention to reduce variability in lumbar spine imaging test use rates for low back pain patients was ineffective among internal medicine and family practice physicians in a large US health maintenance organization.

Design. We retrospectively analyzed data from focus groups that had been conducted prior to the implementation of the intervention. The physicians were asked about the factors that influence their decisions to order such tests.

Study participants. Internal medicine and family practice physicians in the intervention group.

Main study findings. Most of the variability in physicians’ imaging test ordering appeared to occur in the care of patients with back pain of non-traumatic origin who had no radicular symptoms. Within that clinical context, nonclinical factors such as patient age and work status, time constraints, access problems and ambiguity about internal referral processes were important factors in physicians’ decisions. Especially relevant were tensions and conflicts the physicians face as they attempted to meet conflicting role obligations in the health maintenance organization. These tensions raised issues of patient trust in their physicians and in medical care organizations, and it appeared that imaging test orders sometimes served social and symbolic functions in resolving them.

Conclusion. Our findings suggest that gaining information from focus groups prior to designing physician behavior change interventions may aid the design of more effective interventions.

Keywords: focus groups, health maintenance organization, imaging test orders, low back pain, primary care, role conflict

Wide variation exists in the way physicians diagnose and treat particular health problems, and clinical factors alone cannot explain this variation [1—4]. Eisenberg describes ‘a complex interaction of influences’ for this variability in physician practice patterns. These influences are diverse, and include ‘the supply of hospitals and of physicians, economic inducements, style of practice, physician characteristics, character of the practice setting, influence of clinical leaders, concern for the patient’s well-being, patient demand and other patient characteristics, and the perceived good of society’ [5]. The social and symbolic functions that clinical behaviors sometimes serve are another probable cause of practice pattern variation [6].

Wide unexplained variations in physician practice patterns have implications both for quality of care and for efforts to improve medical care outcomes while containing medical care costs [6—8]. Consequently, efforts are increasing to identify effective strategies for bringing physicians’ clinical behaviors in line with authoritative recommendations about state-of-the-art medical practice. Commonly used strategies that target individual physicians include continuing medical education, clinical practice guidelines, practice pattern feedback, ‘academic detailing’, financial incentives, administrative measures, penalties or sanctions, and social influence strategies [6,9—12]. Other strategies, such as continuous quality improvement, involve an iterative process of identifying and removing system barriers to desired clinical behaviors, while at the same time introducing structural changes that support such behaviors [13—15].

Research on the effectiveness of these strategies has not yielded firm guidelines on how to choose the best approach for changing a particular clinical behavior or set of behaviors in a given setting. Examples can readily be found of both successful and unsuccessful outcomes for most well-tested
strategies, and it is often impossible to do more than speculate about why a particular strategy may have been effective in one setting but not in another (or for one clinical behavior but not another).

In this article, we describe how we used findings from focus groups to help us understand why a controlled intervention was ineffective in reducing variability in primary care physicians’ use of lumbar spine imaging tests. The intervention involved dissemination to physicians of a clinical practice guideline on low back pain care and of practice pattern feedback reports on their test ordering. We describe the rationale for using focus groups for this purpose, and then present focus group methods and findings. Finally, we discuss the implications of our findings for efforts to change physicians’ diagnostic test ordering patterns and offer suggestions about how such qualitative findings might be used to inform the design of future physician behavior change interventions.

## Background

Low back pain is second only to colds as a reason for visits to primary care physicians [16]. In the US, estimated direct medical care costs in 1990 for low back pain exceed US$24 billion [17]. Yet despite this heavy health care burden, experts increasingly agree that the majority of episodes can be treated conservatively in the primary care setting. They recommend early mobilization and non-prescription pain killers as the only necessary treatment for most patients, with lumbar spine imaging tests reserved for patients who are still limited by symptoms after several weeks of conservative treatment [18–21].

Despite the usually uncomplicated nature of low back pain, wide geographic variations in diagnostic and treatment patterns have been found in the USA and other countries [22–31]. These variations cannot be explained by differences in the patient populations studied. Such variations may reflect uncertainty among practicing clinicians about the appropriate medical and surgical management of patients with low back pain [22]. The cause of low back pain is often unclear, the correspondence between symptoms and anatomical findings is low, and up to 85% of patients with low back pain cannot be given a definitive diagnosis [26,32,33].

Current trends in low back pain care indicate increasing use of expensive imaging test procedures, such as computerized tomography (CT) and magnetic resonance imaging (MRI) of the lumbar spine [34]. Some research indicates that a good deal of this use may be unwarranted [26,35]. Since these imaging tests frequently reveal clinically irrelevant pathological findings even in asymptomatic patients, unwarranted use of these tests is problematic because it may lead to unnecessary, expensive, and potentially harmful medical interventions [22, 36–38]. To date, little research has focused specifically on the causes of variations in physicians' patterns of ordering imaging tests for patients with low back pain. A recent prospective study of 1580 patients with low back pain seen in the community-based practices of 209 physicians, chiropractors, and nurse practitioners in North Carolina found that test ordering was associated both with clinical factors (e.g. pain levels, sciatica, and functional status) and with non-clinical factors (e.g. practitioner specialty and practice size and patient's race) [35]. However, the decision-making processes that lead to such observed differences remain to be elucidated, as does the extent to which they reflect medically appropriate use.

The site for our study was Kaiser Permanente Northwest Division, an established, not-for-profit, prepaid group-model health maintenance organization (HMO) serving over 400 000 members in northwest Oregon and southwest Washington. Preliminary data analyses in this HMO setting indicated that 6.5% of adult members had at least one office visit for low back pain in 1987. For three-quarters of these individuals, the initial office visit of the episode was to a primary care clinician. Two-thirds of these patients received a non-specific diagnosis (strains or sprains, or simply notation of the symptoms of low back pain). Data from the HMO’s automated radiology utilization database for 1991 showed striking inter-physician variation in average use rates (tests ordered per 1000 adult patient visits) for lumbar spine imaging procedures (used almost exclusively for diagnosing low back pain). For internists and family practice physicians combined, this variation ranged from 2 to 48% for X-rays, from 0 to 30% for CT scans, and from 0 to 9% for MRI. Such wide variation cannot plausibly be accounted for by differences in casemix (i.e. the proportion of low back pain patients in a physician’s practice). At the time we began this study (June 1993), the HMO did not have guidelines for the care of low back pain or for lumbar spine imaging test ordering, and the low back pain guideline developed by the US Agency for Health Care Policy and Research (AHCPR) [19] had not yet been published.

Prompted by concern about the implications for quality of care of this wide inter-physician variation in use rates, as well as concern about the cost implications of increasing use rates for these imaging procedures in recent years, we designed a controlled intervention study to test whether dissemination of a clinical practice guideline, alone or together with practice pattern feedback, would reduce variability in use rates for lumbar sacral spine X-rays, CT and MRI. A group of the HMO’s physicians developed the guideline. The group included an internist, an orthopedist, two physiatrists, a neurosurgeon, and physician members of our research team. The final guideline followed the approach advocated by Deyo et al. [18] and subsequently outlined in the 1994 AHCPR low back pain guideline [19].

Study subjects included all the HMO's internal medicine physicians (n = 67) and family practice physicians (n = 28) engaged exclusively in primary care practice during the year prior to and following the start of the 10-month intervention period that began in May 1994. Physicians in the intervention group (n = 42) received the low back pain clinical practice guideline, followed after 4 months by three feedback reports on their current use rates for X-rays and CT and MRI scans of the lumbar spine, mailed at 2-month intervals. Physicians in the control group (n = 53) received neither the guideline nor the feedback reports. Automated radiology utilization data were used to compare intervention and control group
Despite good dissemination of the intervention materials and their favorable reception by the physicians, neither the guideline alone nor the guideline in conjunction with the feedback reports was associated with a significant decrease in variability in the use rates under study, nor in the actual use rates themselves. The study design and findings have been described in detail elsewhere [39].

To understand better the reasons why our intervention was not effective, we turned to data from exploratory focus groups we had conducted prior to the beginning of the intervention. The focus groups included internal medicine and family practice physicians in the intervention group.

**Focus groups: a qualitative research tool**

A focus group is a form of group interview that makes use of the communication and interaction between group members to study the participants' knowledge, attitudes, and experiences on a particular subject. Focus groups are considered especially useful for studying 'how ideas and knowledge develop and operate within a given cultural context' [40] — that is, how people think, why they think the way they do, and what connections they perceive between their ideas and opinions and their behavior [40,41]. Researchers typically invite a small, relatively homogeneous group of participants to meet in an informal setting for the purpose of discussing a limited number of open-ended questions about a particular issue or topic for a period of an hour or two. The content of the meeting is recorded on audiotape or in written form. The discussion and interaction between the participants constitute the data for analysis, and the researcher generally intervenes only to encourage further exploration of ideas that come up or to make sure that key topics are discussed. Following the data collection, the researchers use some form of content analysis to identify, categorize, and summarize the themes and concepts that emerge from the data [40,41].

**Methods**

The focus groups we describe here were not a formal part of our controlled intervention study design. We made the decision to conduct focus groups during the intervention—planning phase of the study, after discussion among research team members about the possible causes of variability in imaging test rates stimulated curiosity to explore this issue. Although we conducted the groups and completed the analysis of focus group data prior to beginning the intervention, we did not intend to alter our original intervention design in the light of the focus group findings. Our study had been funded explicitly for the purpose of testing the effectiveness of a clinical practice guideline and practice pattern feedback in reducing variability in lumbar spine imaging test use rates (not to explore the reasons for the observed variability).

We invited the 42 internists and family practitioners in the intervention group to take part in a discussion about the problems they face in making decisions about imaging test use when caring for patients with low back pain. During the first half of November 1993, 22 physicians attended one of four 1-hour meetings, held during the lunch break in meeting rooms in the medical offices where they practice. Thus, the attendees at each meeting were colleagues acquainted with one another. Attendance at the meetings ranged from four to eight physicians. Most of the participants were men, reflecting the gender composition of the HMO's primary care physicians (about 80% male).

Two members of the research team, an internal medicine physician (JR), and a health services researcher (DS), facilitated the discussion. Neither facilitator had any administrative or other official role in the HMO, and thus was not likely to be perceived as a conduit of information or 'gripses' to the HMO administration. Over lunch, JR gave a 5-minute introduction describing the research project and some data about variability in imaging-test ordering rates for low back pain patients in the HMO. In order to focus the discussion during the short meeting time available, we distributed a one-page handout of ‘Proposed Topics For Discussion’ (see Table 1).

**Table 1 Handout used to stimulate discussion during focus groups**

<table>
<thead>
<tr>
<th>Meeting to discuss low back pain care: proposed topics for discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>We would like you to think about situations where you have a problem or question about whether or not to order an imaging test (X-ray, CT or MRI scan) for a patient who is suffering from low back pain.</td>
</tr>
<tr>
<td>The list below describes some of the factors that may be influencing your decision:</td>
</tr>
<tr>
<td>Clinical factors</td>
</tr>
<tr>
<td>Patient characteristics</td>
</tr>
<tr>
<td>Practice setting factors</td>
</tr>
<tr>
<td>Characteristics of the test</td>
</tr>
</tbody>
</table>

How do these and other factors interact to influence your decision one way or the other?
1), asking the physicians to think about the factors that influence their decisions in this matter and listing a number of clinical, patient, practice setting and test-related factors that have been identified in previous research as relevant to clinical decision-making [5]. After this initial introduction, the facilitators' role was limited to clarifying points and ideas that the physicians raised, and no attempt was made to limit the discussion to the subjects listed in the handout. The tone of the discussions was amiable and collegial, and all participants contributed to the discussion. When different perspectives were expressed, they were generally received as contrasting or complementary rather than contradictory. DS recorded the physicians' comments and, following each meeting, prepared a written transcript that was reviewed by JR for completeness. DS and JR then reviewed the four transcripts and, using the method of immersion/crystallization, identified and categorized the topics that were mentioned, and summarized the findings. The following description of findings relates to topics that were mentioned at least once by at least one physician in each of the four focus groups.

Findings

There was considerable consistency between the four focus groups in the factors that the physicians perceived as most relevant to their decisions about lumbar spine imaging test orders for their low back pain patients. Two common clinical scenarios appeared to provide the context for most of the variability the physicians described. Both involved low back pain of non-traumatic origin. In one scenario, the patient has no radicular symptoms or signs, and in the other, he or she has radicular symptoms but no radicular signs. Although there was consensus that the optimal approach in such cases was to wait up to 6 weeks before ordering an imaging test, the physicians indicated that they often departed from this rule of thumb. The following factors appeared to explain most of the variation in their behavior: the physicians' perceived role obligations toward their patients and toward the HMO management; time constraints; access problems; uncertainty about the workup needed prior to referral; and patient characteristics such as age and work status.

Patient expectations: building and maintaining trust

A reason mentioned in all the focus groups for departing from the above-mentioned rule of thumb about lumbar spine imaging test ordering was that patients with low back pain often expected, and sometimes even requested or demanded, these tests, despite the physician's explanation that an imaging test was not (yet) warranted. Physicians often felt obliged to satisfy patients' demands, even when they recognized them as medically inappropriate. They explained this in the context of their need to foster and continually reinforce their patients' trust and confidence in them. They regarded this trust and confidence as essential to their ability to enlist the patient's adherence to their recommendations and advice, not merely in a current episode of low back pain but in their ongoing relationship with the patient. If they thought that ordering an imaging test would enhance the patient's trust (or that denying one might undermine it), a test might be ordered even when it was not strictly medically indicated. Some physicians related the pressure they felt to acquiesce to patient demands to patients' presumed negative views of the HMO. As one said: 'patients see this HMO as the VW of health care, and they think the HMO wants to skimp on their care'. These physicians perceived that such negative views made it more difficult for them to gain their patients' trust. They appeared to feel that ordering an imaging test (even when not medically indicated) would counteract the patient's negative image of the HMO and build trust in the physician by demonstrating that he or she cared enough about the patient to 'bend' the HMO's supposedly stringent 'rules'.

Management expectations: a double bind

The physicians also stated that the HMO management's expectations of them sometimes influenced them to acquiesce to patient demands for medically inappropriate imaging tests. They felt that the HMO management expected them to support its efforts to increase the HMO's local market share by keeping their patients satisfied, and that if they did not, they would 'hear about it from Member Relations'. They indicated they would be more likely to give in to the demands of patients they perceived as especially likely to complain to management if their request was denied (characterized by some physicians as 'the more educated ones'). At the same time, they wryly expressed awareness that this expectation conflicted with another of their role obligations toward the HMO management: that of acting as gatekeepers to prevent unnecessary and inappropriate utilization of the HMO's treatment resources (e.g. imaging tests, physical therapy services, referrals to specialists). One physician's comment illustrates the complex nature of these perceived competing demands:

'I sometimes order an imaging test as a substitute for giving the patient a referral to a neurosurgeon. But we don't get any credit for protecting the neurosurgeons. But ... because of long waiting times [for the test], we are still exposed to patient demands while they wait for it]. So we are inclined to expedite matters by ordering the test a bit earlier.'

Time: the scarcest resource

Time pressures faced by the physicians in their practice also appeared to play a role in creating variability in imaging test ordering. In various ways, the physicians expressed the notion that ordering an imaging test might sometimes be used to substitute for one of the HMO's most scarce resources — time with the patient. As one physician said:

'When patients with low back pain are calling frequently and complaining, what they really need is to come and see me and be reassured. But sometimes it's easier to get the
patient an MRI than to get them a visit with me. So I do an imaging test. It buys time. It’s a kind of therapy. It reassures the patient that they’re being cared for.’

Some physicians also noted that it takes time to educate a patient about why an imaging test is not appropriate. Given the pressures they felt from the HMO management to reduce waiting lists and time-to-appointment, they often felt the need to be judicious in the amount of time they invested in this effort. If it seemed unlikely they would be able to convince the patient with a reasonable effort, they would simply order the test. A corollary to this was the physicians’ view that more demanding patients were more likely to get imaging tests, even if they were not perceived as likely to make a formal complaint. As one physician said, ‘The squeaky wheel gets the grease’.

**Access to referral services**

Several physicians felt their test ordering was affected by the accessibility of various referral services for low back pain patients. They indicated that if they perceived there was a long waiting period for a service the patient might eventually need (such as a CT or MRI scan), they might order one earlier than they thought was really necessary just to get the patient in the queue. A related scenario was ordering an imaging test as a substitute for another, preferred, referral service that was perceived as even less accessible: ‘I can’t maximize conservative therapy because of the wait list for physical therapy, so I buy time by ordering an imaging test, even though I know it will not be helpful’.

**Ambiguity of internal referral processes**

Uncertainty about whether these tests were necessary prior to referral to other modalities appeared to be another source of variability in imaging test ordering among these physicians. For example, some physicians were uncertain whether they were expected to order an X-ray before sending a patient for a CT or MRI scan. Others were unclear whether they were supposed to order an imaging test before referring a patient to physical therapy, while yet others said they always order an X-ray before referring a patient to physical therapy, because they ‘know the physical therapists will be more aggressive with the patients if they know they don’t have a disc problem’.

**Patient characteristics**

The physicians also stressed two patient characteristics as particularly relevant to their imaging test ordering behavior: age and work roles. The physicians noted that elderly people were more likely than younger people to have some serious underlying cause for back pain, such as cancer, a compression fracture, etc. So fear of what one physician called ‘a supportable lawsuit’ might be a motivating factor in ordering an early imaging test for an elderly person. On the other hand, some physicians perceived elderly people as less demanding and more accepting of physicians’ authority, and therefore easier to persuade of the need to wait for a test. In addition, elderly people were perceived as having less demanding work roles, so they could more readily than younger people be expected to follow conservative treatment without the need for a test (‘If it’s an elderly lady who has nothing to do all day but look after her cats’).

Among working age patients, work status was also a relevant factor. A young, otherwise healthy person who was off work due to low back pain might receive an early imaging test to rule out underlying pathology so the physician and/or patient would feel comfortable about a quick return to work. On the other hand, knowledge that the patient could take some sick leave without incurring financial hardship could influence the physician to adopt a more conservative approach and postpone an imaging test. A few physicians said they occasionally used an imaging test in support of their ‘social control’ role: when a patient seemed to want to prolong a period of disability unnecessarily, they might order an imaging test to prevent ‘malingering’ (even though they were convinced the patient had no underlying pathology).

**Discussion**

Our focus groups revealed diverse influences on these primary care physicians’ decisions about imaging test orders for patients with low back pain. Strictly clinical factors were important in defining the context in which most of the variability in the physicians’ imaging test ordering behavior appeared to occur: the care of patients whose back pain was not of traumatic origin and who exhibited no radicular signs. Although physicians recognize that such cases will almost always be uncomplicated, they often have trouble reassuring patients with a clear etiologic explanation and an exact prediction of time to recovery. This clinical uncertainty, coupled with the significant distress and disability that low back pain patients frequently exhibit, appears to provide fertile ground for practice pattern variation (notwithstanding the existence of clinical guidelines for low back pain care about which there may be general consensus). Since the above clinical picture probably accounts for the vast majority of low back pain patients seen in primary care, this situation has important implications for quality and cost of care.

However, within this clinical context, the physicians’ discussion focused mainly on non-clinical influences on their decision making about imaging test ordering. These appeared to fall into three main groups. Based on our focus group data, we cannot tell how much variation in test ordering is associated with each type of influence, but the relative attention and emphasis the physicians gave them in their discussions may indicate their relative importance. We discuss these influences here in inverse order to the physicians’ emphasis on them in the focus groups.

The physicians clearly indicated some ambiguity about the type and timing of imaging tests for low back pain patients recommended before referral to other services such as physical therapy or psychiatry. It is hard to imagine how the practice pattern feedback aspect of our intervention could have addressed this ambiguity, but the guideline did clarify these issues both in the text and in its algorithms. The fact that
these clarifications did not result in a detectable reduction in variability following the intervention suggests that ambiguity about type and timing of tests may not have been a major source of variability in imaging test ordering.

The patient factors of age and work status were also clearly relevant to the physicians’ imaging test ordering decisions, and appeared to work in potentially contradictory ways. A patient’s advanced age might sometimes be used to justify an early imaging test order, and at other times a decision to delay one. Likewise, aspects of the patient’s work status and the demands of their work role might in some circumstances suggest an early test order and in others a postponement of one. However, the way that age and work status interact with other patient characteristics in particular instances apparently determines their ultimate influence on practice patterns. This suggests that the variability in test use that the physicians described as related to age and work status may represent their attempts to tailor general treatment guidelines to patients’ personal circumstances. We are unable to confirm this based on the findings of our relatively brief focus group meetings, but future research could explore the constellation of factors that enter into physicians’ ages and work status-related decisions about imaging tests for low back pain patients. Again, the practice pattern feedback component of our intervention did not specifically address this issue, but the guideline had a separate section and algorithm on the care of elderly people with low back pain that might have been expected to reduce variability in test ordering for patients in that age group.

However, it was the tensions and conflicts these physicians face as they attempt to meet their diverse role obligations in this HMO setting that appeared to exert the greatest influence on variability in the physicians’ imaging test ordering behavior. These tensions and conflicts highlighted the issue of trust in the health care system, especially what Mechanic and Schlesinger have called ‘interpersonal trust in physicians’ and ‘social trust in health care organizations’ [42]. Interpersonal trust in physicians is a ‘prerequisite for many aspects of effective care’ especially for the patient’s willingness to make intimate disclosures and to adhere to the physician’s recommendations. It ‘develops gradually in the course of repeated interactions’ and is ‘associated with strong affect’ [42]. By contrast, social trust in health care organizations is ‘more remote, influenced by media exposure and general reputation more than by firsthand knowledge’. It is ‘associated with patient loyalty, essential for maintaining stable patient populations’ [42].

As primary care physicians responsible for their patients’ overall health care, the physicians we studied were highly aware of the need to build and maintain their patients’ interpersonal trust and confidence in them, and they strove to do so through responsiveness to their patients’ needs and concerns. Some physicians perceived that patients’ low level of social trust in the HMO undermined their efforts to build interpersonal trust. All appeared to feel that the HMO management expected them to foster patients’ social trust in the HMO by ‘keeping patients happy’. But the goal of ‘keeping patients happy’ in a large HMO involves more than the interpersonal responsiveness of physicians to patients, and some aspects of physicians’ roles in this setting conflict with others. ‘Keeping patients happy’ also requires modest premiums and quick access to physicians, and primary care physicians are called upon to help achieve these objectives. As gatekeepers in an integrated system of providers, they are expected to act with cognizance of access problems in other parts of the organization (e.g. radiology, physiotherapy) and to restrict unnecessary access by ‘assigning values’ (i.e. necessary/unnecessary) to services that patients may value differently— even though this may sometimes limit their responsiveness to patients’ concerns and expectations (thus possibly undermining patients’ trust in them and in the HMO). As another example, efforts in the HMO to reduce time-to-appointment have resulted in strong constraints on the amount of time physicians can allot to individual patients. But truncated patient encounters are apt to inhibit the development of patients’ interpersonal trust in their physicians [43]. Such ‘double bind’ situations are not unique to this HMO setting, having been noted among primary care physicians in other prepaid health care settings as well [44].

As physicians seek to resolve the tensions they face in complex situations such as these, ordering an imaging test—even one the physician knows is not medically indicated—may serve important social and symbolic functions. Faced with their patients’ pain, anxiety, and expectation that the physician ‘do something’ to help, ordering the test may serve the symbolic expression of caring and concern when the physician has neither the time, skills, nor tools required to educate and reassure the patient that the distressing symptoms will disappear with time, nor the ability to get the patient a quick referral to another modality of care such as physical therapy. At the level of sheer expediency, ordering the test may serve the social purpose of gracefully signaling that the visit is over or save the time that would be required to educate an anxious and demanding patient that the test is not necessary. Physicians undoubtedly vary in their tolerance for such role conflicts and in the way they manage them, and their patients vary in their needs and expectations and in the way they assert them. Thus, such social and symbolic uses of lumbar spine imaging tests are likely to result in considerable medically unexplainable test ordering. Previous research has indicated that some of the social and symbolic meanings described above may underlie ‘non-scientific’ variations in drug prescribing as well [6].

Clearly, our intervention strategy was not designed to address the conflicts and tensions described above, and almost certainly had no effect on this major source of variability in imaging test use for low back pain patients. Effectively addressing the role conflicts experienced by these physicians undoubtedly requires intervention and changes on several levels: individual patient and physician, organizational, and social or policy level. Suggestions for strategies to address such conflicts come from a number of contexts, some specific to low back pain care and some more general. In a discussion of strategies for implementing the back pain management guidelines recently issued by Britain’s Royal College of General
They value the opportunity the HMO affords them to inevitably at least a minimal confluence between physician public policy and legislation. They argue that 'professional provide high quality medical care without concern for patients' preferences and practices and patients' expectations about low back pain care can in fact be modified by appropriate interventions [45,46].

In their article on the likely effects of features of US managed care organization – such as utilization review, withholds, and gag rules – on patients' trust in their physicians and in medical care organizations, Mechanic and Schlesinger suggest the individual-level strategy of teaching medical students and practicing physicians 'the skills and motivation to be effective advocates for their patients' [42]. But most of their discussion focuses on addressing these issues through public policy and legislation. They argue that 'professional norms and public policies should encourage clear separation of interests of physicians from health plan organization and finance' [42].

It is clearly important to seek ways to minimize tensions and conflicts such as those faced by the physicians we studied and those Mechanic and Schlesinger describe. However, our findings suggest that a perfectly 'clear separation' between physician interests and health care plan organization and finance may not be attainable in practice. In the not-for-profit group model HMO that we studied, physicians are not subject to utilization review, withholds, or gag rules, and they run no risk of 'deselection' from the group practice based on their utilization patterns. A modest incentive system provides for a bonus of a maximum of 10% of salary based on a global composite index of how well the group practice as a whole met a set of goals that includes HEDIS-type quality targets and patient satisfaction with service and access, in addition to cost-related goals. Nevertheless, some confluence between physicians' interests and health plan organization and finance remains, if only because the majority of the HMO's physicians identify with the HMO's goals and prefer working in this setting over other practice options. They value the opportunity the HMO affords them to provide high quality medical care without concern for patients' financial circumstances, and feel that the range and degree of organizational controls they face over the way they practice are generally legitimate and appropriate [47]. Obviously, the organization's success in the marketplace is a condition for these physicians' continued employment in it. Thus, there is inevitably at least a minimal confluence between physician and health plan interests, and it is not clear that completely eliminating it would in fact be desirable. It has been suggested that the type of commonality of interests between health plan and physicians that exists in the HMO we studied is a major reason for the success and cost-effective performance of the prepaid group practice form of managed care [47].

Finally, it is also worth calling attention to some issues that did not emerge in the course of the focus groups. For example, other than age and work roles, the physicians placed little or no emphasis on patient characteristics that other research has found to be predictive of test-ordering for low back pain patients, such as pain levels, functional status, and anxiety [30]. It should also be noted that the physicians gave no indication that characteristics of the imaging tests themselves (such as discomfort of the test, risk of false positives, or cost of the test) figured significantly in their decisions about whether or not to order imaging tests for patients with low back pain. Possibly, the relative brevity of our focus group meetings (held during 1-hour lunch breaks in the physicians' medical offices) limited the range of topics that could be discussed only to those that were most salient and common to all physicians. Longer meetings and/or more prompting by the facilitators might have elicited discussion of these and other additional topics.

The focus group methodology involves the important caveat that inferences about the generalizability of the findings must be drawn with caution. Our focus groups included over 50% of the primary care clinicians in the intervention group, and given the highly integrated nature of this group practice HMO, the structural and patient factors that influence these primary care physicians' lumbar spine imaging test orders are almost certainly very similar to those that influence the rest of their primary care colleagues. Our findings may also be generalizable to primary care physicians in other HMOs similar to this one, i.e. highly integrated not-for-profit organizations that accord primary care physicians a gatekeeping role and that operate in competitive markets that make maintaining high patient care productivity in an environment of constrained resources (especially time with patients) imperative upon physicians.

**Conclusions**

A retrospective analysis of data from focus groups conducted in the planning stage of our intervention study gave us considerable insight into the reasons why our intervention was ultimately ineffective in reducing variability in primary care physicians' lumbar spine imaging test orders in the care of their low back pain patients. According to the views expressed by the physicians who participated in these groups, the main source of this variability appeared to be the conflict the physicians faced between their diverse role obligations in this HMO setting. This conflict highlighted issues of interpersonal trust in physicians and social trust in the HMO. It appeared that lumbar spine imaging test orders were sometimes used to serve non-clinical functions in order to help resolve the resulting tensions. Our guideline and feedback
intervention strategy was clearly not designed to address these problems and conflicts. The guideline component of the intervention did address some of the other likely sources of variability, such as ambiguity of internal referral processes and the process of care for elderly patients. But any effect the guideline may have had on these factors was apparently dwarfed by the intervention’s failure to deal with the principal, essentially structural source of variability.

Factors analogous to those revealed by our study probably exist in regard to other clinical and patient behaviors that are the targets of strategies to improve the functioning of the health care system. Our study findings lead us to suggest that the use of focus groups in the preliminary stages of planning can help to elucidate factors at the individual physician and patient level, the organizational level, and the community or social level that are relevant to the goals of such strategies. When feasible, the focus group findings could then serve as the basis for the design of quantitative surveys of a larger and more representative group of the targeted physicians, to determine the relative importance of the issues identified by the focus group participants. Appropriate use of the information from both types of studies should ultimately lead to the design of more effective behavior change strategies.

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