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ORIGINAL ARTICLE

Harnessing stakeholder perspectives to improve the care of osteoporosis after a fracture

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Abstract
Summary This study used in-depth interviews and focus groups to evaluate osteoporosis care after a fracture. Patients (eligible women aged 67 who sustained a clinical fracture(s)), clinicians, and staff stated that an outreach program facilitated osteoporosis care management, but more-tailored education and support and increased participation of orthopedic specialists appear necessary.
Introduction Osteoporosis treatment reduces fracture risk, but screening and treatment are underutilized, even after a fracture has occurred. This study evaluated key stakeholder perspectives about the care of osteoporosis after a fracture.
Methods Participants were from a nonprofit health maintenance organization in the United States: eligible women members aged 67 or older who sustained a clinical fracture (s) (n=10), quality and other health care managers (n=20), primary care providers (n=9), and orthopedic clinicians and staff (n=28); total n=67. In-depth interviews and focus groups elicited participant perspectives on an outreach program to patients and clinicians and other facilitators and barriers to care. Interviews and focus group sessions were transcribed and content-analyzed.
Results Patients, clinicians, and staff stated that outreach facilitated osteoporosis care management, but important patient barriers remained. Patient knowledge gaps and fatalism were common. Providers stated that management needed to begin earlier, and longer-term patient support was necessary to address adherence. Orthopedic clinicians and staff expressed lack of confidence in their osteoporosis management but willingness to encourage treatment.
Conclusions Although an outreach program assisted with the management of osteoporosis after a fracture, more-tailored education and support and increased participation of orthopedic specialists appear necessary to maximize osteoporosis management.

Keywords Barriers · Bone mineral density · Facilitators · Medication · Osteoporosis

Introduction

Osteoporosis is a common condition that results in substantial morbidity and mortality [1]. It is found in nearly 20% of women over the age of 65, many of whom will

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suffer subsequent fractures, disability, and diminished quality of life [2]. While treatment reduces fracture risk, screening and treatment are under-utilized, even after a fracture has occurred [3]. Although a number of strategies have been found to be effective in prompting patients and clinicians to improve osteoporosis care management after a fracture, the effect sizes of interventions to date have been modest [4–7]. For example, among members of a large health maintenance organization (HMO) in the United States (US), a patient-specific electronic medical record (EMR) prompt to the primary care provider (PCP) led to 51.5% of post-fracture patients receiving osteoporosis management (a bone mineral density (BMD) measurement or osteoporosis treatment) in the 6-month post-fracture, as compared to 6% in the usual care group [4–7]. The later implementation of this approach along with a centralized patient outreach resulted in 44% of patients receiving osteoporosis care management by the end of the study, leaving more than half of patients without clear management [8].

To achieve further improvements in care, future interventions will need to incorporate components that address the barriers that patients and staff have to osteoporosis management. While a number of patient barriers to osteoporosis management have been described [9, 10], only a few studies have attempted to integrate those findings with the views, roles, and preferences of the clinical staff involved in osteoporosis care [11]. Following implementation of the outreach program described above [8], the study we report on here conducted focus groups and individual interviews with patients, PCPs, orthopedic clinicians and staff, and managers to evaluate the outreach program. The focus groups and interviews elicited barriers and facilitators to screening and treating osteoporosis, perceived utility of the outreach program, and overall advice on how to improve screening and treatment of osteoporosis. Our study's immediate goal was to use the findings reported here to improve the outreach program in the future, with the long-term goal of improving osteoporosis care and fracture prevention.

Materials and methods

Setting

Qualitative evaluation of the outreach program was conducted at a non-profit, group-model HMO in the Pacific Northwest US with about 485,000 members and an electronic medical record. Demographic characteristics of the HMO members are similar to those of the area population [12]. The protocol for this evaluation was approved by the HMO's Institutional Review Board, and participants provided written informed consent.

Outreach program

The outreach to PCPs and patients was designed to improve the care of osteoporosis after a fracture [8]. PCPs with eligible patients were sent patient-specific EMR messages by a physician's assistant or registered nurse operating under a protocol. The message informed the PCP that the patient had a fracture; suggested follow-up, citing a guideline recommendation; and offered to follow up with the patient on the PCP's behalf. The follow-up, if requested, utilized mailings and one–two phone calls to encourage and initiate osteoporosis screening and/or treatment. A care summary then was sent to the PCP, who provided further follow-up as necessary.

The outreach program led to increases in the frequency of BMD measurement and osteoporosis medication dispensing, but the effect varied among important subgroups. For example, older patients were less likely than younger patients to be treated [8].

Design of qualitative program evaluation

Family practice and internal medicine PCPs and orthopedic providers were recruited for the program evaluation using a stratified sampling method. Table 1 summarizes the participant data collection method, including participation rates. We recruited PCPs from a list of 24 providers who had at least ten patients enrolled in the outreach program. We recruited orthopedic providers from a list of 35 that included individuals with different types of professional certification, levels of practice, and locations worked in order to obtain diverse perspectives. We also sought to interview health plan leadership with quality improvement responsibility and experience representing a range of geographic areas (from a group of eight individuals), and the five staff who performed the patient outreach. Scheduling conflicts were the primary reason for PCPs, orthopedic providers, and managers/health plan leaders to decline participation in the interviews or focus groups.

We completed nine semi-structured, in-depth individual interviews with primary care physicians (37.5% approached participated) and five with key managers (62.5% approached participated). We also conducted six focus groups: four among orthopedists and allied staff members (n=28) (80% approached participated); one with the members of the osteoporosis outreach team (n=5) (100% participation); and another with members of an osteoporosis quality improvement committee (n=10) (55.5% participation). A total of 57 staff were included—29 physicians, five allied health providers (nurse practitioners and physician assistants), 12 registered nurses, one pharmacist, and ten other staff.

Table 1 Participant and data collection method summary

Participant type	Data collection method	Participant total	Recruitment pool total
Patients (women 67)	In-depth individual interview	10	34
Primary care clinicians	In-depth individual interview	9	24
Key managers	In-depth individual interview	5	8
Orthopedists and allied staff	Focus groups (four groups representing various geographic locations)	28	35
Osteoporosis outreach team	Focus group (1)	5	5
Osteoporosis quality improvement committee	Focus group (1)	10	18
Total number of participants		67	124

We completed ten semi-structured, in-depth patient interviews. We used a purposeful sampling method to recruit patients who were age 67 or older, had a fracture but no BMD measurement or osteoporosis treatment in the prior 12 months, and had participated in the outreach program. We attempted to balance participants on age (67–75 and 76) and whether they had accepted or declined the referral/advice offered during the outreach. Utilizing a letter and follow-up phone call, we recruited from a list of 34 eligible participants (29.4% approached participated). Primary reasons for participants not being interviewed included feeling unwell, uninterested, and unreachable by phone.

Data collection and analysis methods

Interview guides were developed by the research team based upon their prior experience [4, 8, 13, 14] and a literature review. Using a standard qualitative technique, the research team refined the guides for relevancy and utility following the first few interviews. The interview guides elicited barriers and facilitators to screening and treating osteoporosis, the perceived utility of the outreach program, and overall advice on how to improve screening and treatment of osteoporosis. Interviews and focus groups were conducted by two of the authors (AF and JS) trained in qualitative research [15, 16], tape-recorded, and professionally transcribed for analysis. We aimed to interview each stakeholder group until we elicited no new content [17]. To analyze the transcripts, we used standard qualitative methods [18, 19] that focused on representing, describing, and interpreting the data. A coding dictionary was developed by marking passages of text with codes indicating the content of the discussions. Coded text was reviewed through an iterative process, resulting in refined themes [19, 20]. A qualitative research software package, *ATLAS.ti* 5.0 (Scientific Software Development, 1997), was used to electronically code and manage data and to generate reports of coded text for analysis.

Results

Patient barriers to the management of osteoporosis

We compared PCP and patient perceptions of patient barriers to osteoporosis management. Their views were highly concordant and highlight several management challenges. These common themes, along with key findings, are summarized in Table 2.

PCPs noted, and patients demonstrated, a lack of patient understanding of osteoporosis and its management, especially when compared to other common conditions. PCPs and patients stated that the confusion of osteoporosis with osteoarthritis promotes the idea that osteoporosis is an inevitable and benign consequence of aging. PCPs and patients noted strong media influence on patient perceptions of osteoporosis. PCPs noted that the popular press increased demand for frequent and perhaps unwarranted bone mineral density screening.

Patients who had received medication desired more information about their medication and were concerned about the long lists of drug side effects in advertisements. PCPs perceived that patients often had concerns/complaints about side effects from bisphosphonates and supplements. PCPs stated that side effects and challenging medication routines led to compliance problems in excess of those seen with other chronic medications and stated the need for assistance with ensuring compliance. Patients expressed confusion about how long they needed to take their medications and what might happen if they stopped. Even after having received the outreach, they desired more follow-up to address these areas.

Interestingly, PCPs and patients stated that neither medication cost nor transportation needs for BMD measurement were major barriers for screening or treatment compliance.

PCPs highlighted the unique challenges in addressing osteoporosis in younger versus older post-menopausal women. Fatalism, or the sense that finding osteoporosis

Table 2 Patient barriers to the management of osteoporosis as perceived by PCPs and patients

Stakeholder	Key findings	Illustrative quotes
Common Theme: Lack of knowledge or understanding		
Primary care providers	Lack of awareness of osteoporosis as compared to other conditions	*I don't think the word is out...women are more aware of having a mammography starting at age 40 than they are of osteoporosis screening at age 65*
	Confusion of osteoporosis with arthritis	*People just think that osteoporosis is the same thing as arthritis and they don't worry about it*
Patients	Lack understanding of osteoporosis	*I don't know for sure [what osteoporosis is] I think bones just get weak as you get older or something*
	Lack clear information on medications and supplements	*I don't know what the Fosamax does. I suppose it strengthens bones, but that hasn't really been explained to me. And I think it would help to know*
Common theme: medication issues – side effects		
Primary care providers	Experience immediate side effects	*Some patients won't tolerate the Fosamax very well. I've had a bunch that just can't take it. Some don't tolerate the calcium either and so that's also difficult to get them to take adequate calcium*
	Long-term concern for side effects	*I mean, Fosamax has got lots of problems. We've had people actually have upper GI bleeds from Fosamax. And now this study came out about losing bone density in your jaw from taking Fosamax*
Patients	Frequent side effects	*As long as it doesn't bother my stomach or my esophagus...because there are a lot of side effects to Fosamax* *Both the calcium and the Fosamax constipate me. And so I have a tendency to not take them as I should*
	Long-term concern for side effects	*There are side effects of Fosamax, which I guess they [researchers] have found something in the jaw now... Once you're on it, then it stays in your system and you wonder what damage have you've done to yourself?*
	Avoid taking "pills"	*I'm not really a medication type person, and I wanted to see if the weight training would help*
Common theme: medication issues – negative media influence		
Primary care providers	Media reports and advertisements of osteoporosis influence patients	*There is also lots of confusion [for patients] about what you do to follow up. Repeat DXAs make absolutely no difference in the outcomes. But, it is tough to sell that to your patients because they hear on the morning talk shows, "You need a DXA about every 'x' amount of time"*
Patients	Media reports and advertisements of osteoporosis highlight medication side-effects	*If you look at ads in magazines, it will list side effects [for osteoporosis medications]. And sometimes the side effects seem worse than the actual thing you are taking it for – so I'm leery*
Common theme: medication issues – challenging routine		
Primary care providers	Medication formulation creates memory/routine issues (daily versus once a week)	*They forget to take it because it is once a week. They tolerate it better than a once a day preparation, definitely, but just remembering to do it and somehow not getting the importance of it*
	Medications require time to take correctly	*I think most find taking the bisphosphonates annoying because of the reality of how you take them—the first thing in the morning, on an empty stomach with a large glass of water and stand or sit upright for half an hour. When people have to do that daily—that is a hassle*
Patients	Challenging to remember to take medication regularly	*Well, for the last two weeks I have forgotten to take it [Fosamax]*
	Requires time and effort to take medications correctly to avoid side effects	*I have wondered why you have to take this [Fosamax] a certain way.... You have to sit up for a half hour*

Common theme: age-related issues – older		
Primary care providers	Challenges in treating older population	*...I have the hardest time with the very elderly who are osteoporotic and are prime candidates for treatment... often they are already on lots of drugs and so there is resistance*
Patients	"Fatalism"—I'm old and I'm going to be sick	*I've got enough problems without finding out about that [osteoporosis] too. Some things you can't do anything about at my age*
Common theme: age-related issues – younger		
Stakeholder	Key findings	Illustrative quotes
Primary care providers	Demand by younger population	*The people interested in osteoporosis are the group of women who are between 55 and 65 years of age. They are very interested in health...the Baby Boomers... the ones asking for it [screening]. Telling them, 'Oh, well, we don't really check this—it's too early to do it,' just doesn't wash very well with that group* *I've had a couple of younger patients who more or less demanded screening. 'My grandmother had osteoporosis at 70 and I don't want to wait until then to find out'*
	Generational difference in approach to health	*I see a difference in generations...it [osteoporosis] is not a huge issue for them (elderly). If they have it, they probably already have it, you pick it up when they fall and break their hip. But younger women...want a bone density when they are forty-five. Guidelines about osteoporosis need to be sensitive to the culture in which all these women are living*
Patients	Desire for early and frequent BMD testing	*I would like to know when I can have another bone density test, because no one has mentioned that*
	More active approach to health versus "just part of aging"	*I realize now that osteoporosis is not just something we have to get as we age. So I intend to stay active as long as I can [younger participant].* Versus: *I just don't think about osteoporosis or worry about it [older participant]*
Common theme: compliance issues		
Primary care providers	Gaps in follow-up of medication issues	*Not only do many older patients quit taking the medications...the ones who seem to need it the most, it has been hard to keep them on. More help on ways to try to keep them going [on medications] might be helpful*
	Cessation of medication/	
Supplements over time	*Most people when told they have osteoporosis SAY they will take their treatment. There is that compliance that is always in doubt because no one counts their pills*	
Patients	Questions and concerns about how much and how long to take medications and supplements	*If you stop taking it [Fosamax] all of a sudden, do you have to go back to square one or not? I just don't know for sure.* *I don't feel any different [on the Fosamax], and so that is why I was wondering about how long you should take it and then have another bone density test to see how it's working.*
	Desire for follow-up communication	*Once they [health care team] let you know you have it and they want you to take all of these tests and medications, then I think they should continue to follow up*

and treating it would not be worthwhile, was noted to be prevalent among very old (age 80) patients. This contrasted with more active involvement among younger participants, who were more interested in prevention and generated more demand for osteoporosis screening. PCPs expressed frustration with the time required to deal with younger women's demand for screening in excess of guideline recommendations.

Patient-noted facilitators of osteoporosis management

Interviews with patients also explored potential osteoporosis management facilitators. Patients of all ages expressed more willingness and comfort with taking supplements (calcium and vitamin D) than prescription medication for osteoporosis. Patients appreciated the assistance they received with transportation from friends and family, and the inexpensive and convenient medical transport options to obtain screening exams and medications.

Patients' trust in PCP advice and information from the health plan facilitated osteoporosis management. Also, patients noted that tips for routinizing medication use, such as using triggers (e.g., meals, calendars, placement of medications) to remember when to take medications, facilitated long-term adherence. Younger patients (aged 67–75) were more likely to say they wanted to live a long and active life, acquire health information, and understand osteoporosis and its prevention. These younger patients were more likely than older patients to describe lifelong involvement in activities to promote health and wellness, such as exercising regularly, eating nutritionally, and applying a "sensible" or "practical" approach to all aspects of their health. Additionally, younger patients were more likely to have an understanding of osteoporosis and related risk factors. These attributes seemed to serve as facilitators to disease management.

Health system barriers to the management of osteoporosis

We compared PCP and orthopedic specialist perspectives of health system barriers to the management of osteoporosis. Common themes, along with key findings, are summarized in Table 3. Both PCPs and specialists said they have severe time constraints for addressing osteoporosis risk during acute care visits and need safety net approaches to ensure needed care. PCPs cited the impact of multiple competing health needs, and orthopedists wondered, given their high-volume acute fracture load, how they would find the time to research patients' osteoporosis status and obtain the additional training they need to understand osteoporosis screening and treatment. Since a broad array of screening tests is relevant to osteoporosis, PCPs and orthopedists cited difficulty in efficiently finding relevant DXA and laboratory results in the medical record. Orthopedists noted that they were particularly unpracticed in interfacing with the EMR tools that might assist them.

PCPs and orthopedists agreed that numerous osteoporosis management gaps result during the transition from specialty to primary care when an older patient has a fracture. Orthopedists note that they see patients for acute needs—to address the fracture, not the potential underlying cause of osteoporosis. PCPs expressed frustration with the long delay or "missed opportunity" in addressing osteoporosis after a fracture, which results from their not seeing patients until many months later (if ever).

Although most orthopedists believe they need to take a more active role in osteoporosis management, they agreed that this is not happening consistently. Some expressed the view that orthopedists are trained to do surgery and that their role should be limited to that. Orthopedists expressed lack of confidence in many aspects of osteoporosis care. PCPs stated that they would welcome the initiation of at least BMD screening by specialists at the time of a fracture and noted that bisphosphonates could be prescribed then also because of their lack of interaction with other medicines.

Orthopedic specialists were uncomfortable with ordering something (e.g., a laboratory test or medication) because they might be expected to follow up on the results (i.e., the "system" would label them as the responsible party for the tests and medications). Orthopedists were especially concerned about having to assume the management of patients who do not have an assigned PCP.

Several orthopedists expressed frustration that osteoporosis was not detected and treated in advance of a fracture. Many stated that when they became involved it was "too late."

Even when orthopedists became involved early with osteoporosis management, they stated that communication with PCPs was suboptimal. Specialists stated that part of the problem was finding the most effective and quickest ways to relay information. While PCPs expressed a strong desire for specialists to play a greater and more consistent role in osteoporosis, some orthopedists were concerned that this might be perceived as PCP "territory infringement." Another specialist concern was that an already overburdened primary care system could not absorb their referrals for follow-up.

PCPs stated that they were not comfortable with determining who might benefit most from the treatment for osteoporosis. Orthopedists stated that they recognized this issue among PCPs.

Both groups acknowledged inconsistent management (e.g., neither type of clinician consistently ordered a DXA in certain situations) and a bias against treating elderly patients because of a general tendency to believe that nothing can be done for them. Both types of clinician also mentioned the lack of easy access to information about osteoporosis, in particular, confusion about the utility of vitamin D to prevent and treat osteoporosis.

System facilitators of osteoporosis management

All interviewees provided input on current system supports and recommendations for improving care systems for osteoporosis in the future. These findings are highlighted in Table 4. Respondents agreed that the outreach program

Table 3 Health system barriers to the management of osteoporosis as perceived by PCPS and orthopedic specialists

Stakeholder	Key findings	Illustrative quotes
Common theme: lack of time		
Primary care providers	Challenging to address education and treatment options during brief office visits	*The way our system is set up.., we all have too much to do and too many patients—and things fall through the cracks. Not intentionally, but it's just too much.* *...So anything we can do to put a safety net over a lot of that stuff... bringing in people so we can do what we need to do, I think is great*
	Challenge of competing health issues to address	*I think a lot of doctors don't even like to bring it [osteoporosis] up... because it is a quagmire. And if you only have 20 minutes and you have a bunch of things you have to do, you just don't want to get involved in it*
Specialists	Busy fracture clinics with less staff than needed	*Fracture clinic is high volume, so interactions need to be quick and easy*
	No time to "research" patient status	*That research [about osteoporosis] is a little too much for us to do...If we don't see osteoporosis in the diagnosis, we need to look in the medication records or office visit notes to see if it has been addressed appropriately*
	No time to learn about or follow up on lab results (DXA scan) or medications	*I will NOT follow-up on those labs. I don't have time. Orthopedics is under the gun and there is no way we can expand our scope of practice...*
Common theme: difficulty accessing records		
Primary care providers	Difficult to efficiently locate labs/results	*There needs to be a way of finding it [DXA results]. Some people have had one and they don't know what the result is...if it's not recent, then you might have to do a little searching*
	Older results/labs may be difficult to locate	*That is one barrier right now—finding out if somebody has ever had a DXA and when it was, because that particular test tends to get lost in the system*
Specialists	Less familiarity in accessing lab reports and records	*It [accessing labs/results] is a slippery slope. You are less efficient if you don't use it enough. And we definitely don't use it [computer tools] often enough...*
Common theme: management gaps in the transition from specialty to primary care		
Primary care providers	PCP delay in seeing patient after fracture creates a "missed" education and treatment opportunity	*Here is a typical scenario... an older person falls and breaks a hip. They're admitted and get their hip fixed..., maybe 5 to 6 months, or maybe never, they come back to see us [PCP]. By that time, it [the fracture] has sort of faded into the background and we're back to juggling all their medicines. The fracture is...well, nobody is really thinking about that anymore...and so it [osteoporosis] gets dropped off people's radar screen*
	Lack of consistent education and initiation of osteoporosis management at the time of the fracture	*It is appropriate for [orthopedists and specialists] to do that [initiate screening for osteoporosis]. Our osteoporosis medications have almost no interaction with other medicines that we prescribe, so [specialists don't] have an excuse to say, 'Oh, it's too complicated for me' [to initiate screening]...it's not*
	Gaps in follow-up of results	*I mean, even outpatient ones [fracture visits], they can copy the PCP, although I don't know that they always do from fracture clinic...If there was some automatic electronic alert that was triggered when someone had certain kinds of fractures, that might make an effective result for PCPs* *I may not necessarily know [about labs/DXA], since somebody else ordered it, whether or not it was actually done. And so I wouldn't know the results unless I, for whatever reason, actively set out their results*
Specialists	See patient during acute "emergency situation" where osteoporosis takes low priority	*We are busy...and so we don't necessarily stop to discuss osteoporosis. You just kind of shrug your shoulders [when encountering osteoporosis] and go, ooh, that's bad*

Table 3 (continued)

Stakeholder	Key findings	Illustrative quotes
Common theme: lack of time		
	Variation and inconsistency regarding approach to osteoporosis screening	*It [initiating screening and communication with PCP] is not happening consistently, especially with minor fractures...it just doesn't get done consistently*
	Lack of comfort with osteoporosis medications and dealing with side effects	*It is internal medicine's job...to be responsible for ongoing things like osteoporosis, plus these medicines have side effects*
	Concern about follow-up competency	*It is way beyond us to be treating people with medical problems on multiple medicines*
	Not all patients have a PCP, so information from specialists can become "lost"	*...not every patient has a primary care provider...if we're seeing people in the ER for non-operative fractures, we will say, this is perfect for primary care to follow up on...then there is no primary care physician for this patient*
	Electronic system "defaults" for follow-up to whoever ordered tests/labs initially	*Typically, the system defaults to whoever orders the labs. Then that makes ME responsible for the follow-through on it*
Common theme: other primary and specialty care integration issues		
Primary care providers	Activity should be moved upstream from a fracture	*You know, some of the things that might help as well is to have a significant education outreach and to have information that can be passed to the patient—that might be a benefit*
	Lack of consistent partnering and communication with specialists	*...capturing people upfront in the hospital [or ER or fracture clinic] is important, because we need to make sure EVERYBODY is on board with getting the ball rolling with communication and facilitating the workup [of osteoporosis] and treatment as soon as we can*
	Strong desire by PCPs for specialists to play a greater and more consistent role	*There is no reason why they [orthopedists] can't do this legwork, they could somehow start the ball rolling*
Specialists	Focus should be on prevention of fractures and osteoporosis	*I think the main focus should not be about orthopedists... we're sort of way down the line on catching osteoporosis patients...Instead we ought to focus on prevention*
	Tension between historical role (surgery only) and shifting new role ("identifier")	*Orthopedic surgeons are trained to do surgery. That is...our role...it is not to necessarily screen and treat osteoporosis.* VERSUS *The pendulum is swinging toward orthopedic surgeons wanting and seeing the need to take more active role in osteoporosis*
	Lack of familiarity with [EMR] communication system—how to best send communications to PCP	*I find it difficult to use and I never use it [tools]. It's another level of complexity, time, and things to remember*
	Concern that increased specialist role might be perceived as "territory infringement" by PCP	*Diagnosing and treating osteoporosis has traditionally been a part of primary care's role, so increasing orthopedists role might be seen as 'taking over' ...*
	Concern that increased communication to PCP would increase already burdened PCPs	*One huge barrier is the primary care people are overwhelmed with their work already...they [PCP] are not able to effectively manage them [increases in messages regarding patient with osteoporosis]*
Common theme: other training/management quandaries		
Primary care providers	Belief by some PCPs that osteoporosis lacks clear or "good" medication/treatment options	*I have some major philosophical problems with both the diagnosis and treatment of osteoporosis... where do you draw the line of risk and benefit? ...the majority of people on therapies... will not do them good, statistically speaking*
	Lack of training in current practices regarding calcium and vitamin D testing and treatment	*With the vitamin D thing, you've got to go find the guideline and look at it and figure it out. So it is not really cut and dried. There are several different [dose] options and a lot of potential pitfalls*
	Challenges of treatment decisions for older, more complicated women (80)	*Some of the decisions about when to do it [osteoporosis screening] are partly based on medical need and partly based on being pragmatic. It [screening in the very old] doesn't necessarily result in extended life, etc. But sometimes people have a hard time understanding those concepts*
Specialists	Belief by some Specialists that not all PCPs are comfortable with managing osteoporosis	*I'm not sure that every primary care physician actually feels that comfortable with treating osteoporosis, or as*

Table 3 (continued)

Common theme: lack of time		
Stakeholder	Key findings	Illustrative quotes
		comfortable as they would feel in treating hypertension
	Lack of training in management of lab results, DXA, and medications	*We are taught a little bit about how to look at them [DXA] and what the results mean, but the labs are a bit different... we are not as well versed in the labs*
	Need to overcome "old training" that there is "nothing" that can be done for an older patient with osteoporosis	*As far as the boat having sailed when you see an elderly female patient, that has historically been...you can try and prevent it early enough, but it is not easy to rebuild what has already been lost*

addressed the difficulties with transition from specialty to primary care after a fracture. It served to provide patients with timely counseling and management, and it reduced care variation while reducing the burden on PCPs. Efficiencies could be realized by sharing best practices among outreach workers, standardizing operating procedures, and encouraging creative use of staff. Respondents strongly recommended that managers expect and plan for long-term sustainability and consistently fund the outreach program. Interviewees supported broadening the scope of outreach to include longer-term follow-up with medication compliance and patient concerns.

All respondents advocated for standardized protocols for integrating and involving specialists (orthopedists, fracture clinic staff, radiologists, emergency staff) in the management of osteoporosis at the time of fracture. Most stated that specialists should provide basic education in osteoporosis and initiate screening or treatment, with follow-up by a PCP or care manager.

Besides the EMR data, Web-based guidelines and pregrouped orders and alerts in the EMR were perceived as useful. Specialists were less accustomed to using these tools, so they were less confident about their ability to use them in their practice. All clinicians advocated keeping electronic tools simple and accessible.

Several other recommendations addressed provider and patient education. Most interviewees stated that PCPs and key specialists should receive ongoing education in osteoporosis treatment, interpretation of DXA results, and efficient and effective ways to monitor and treat secondary causes of osteoporosis (such as Vitamin D deficiency). Respondents perceived a need for patient information on osteoporosis prevention and management. PCPs and specialists strongly endorsed expanding patient support to primary prevention. Although during the outreach program clinicians could request that an osteoporosis educational packet be mailed to patients, among clinicians there were gaps in awareness and follow-through on its use. Clinicians stated that they would benefit from being prompted to provide educational information, or it should be sent out automatically. More educational opportunities for patients, such as classes or chat room/Internet support, would be valuable too.

In summary, our analyses of responses from providers and patients revealed common perceptions regarding patient barriers to osteoporosis care, including gaps in patient knowledge and understanding of osteoporosis, generational differences in patient needs and approaches, and the influence that the media has upon medication use. Another common theme was the challenge of adhering to bisphosphonates due to the routine required and the side effects.

Patient interviews revealed several facilitators of care: positive orientation toward the use of supplements and vitamins; social support; adherence, based on engaging in medication routines and trusting the health care provider/system; and the patient having a proactive approach to health.

Common themes emerging from the comparison of PCP and orthopedic specialist views of barriers to care included lack of time during visits, difficulty accessing records, care management gaps in the transition from specialty to primary care, and integration issues between specialty and primary care. As facilitators of care, clinicians and managers endorsed the effectiveness and utility of the outreach program, Web-based osteoporosis clinical guidelines, EMR tools, and patient education materials. Staff provided advice on areas for future quality improvement: better integration of specialist and primary care roles in osteoporosis care, improved methods for efficient retrieval and follow-up on osteoporosis-related patient evaluations, more clinician education, and several methods to optimize patient outreach programs.

Discussion

Findings from our focus groups and interviews with patients, PCPs, orthopedic clinicians and staff, and managers yielded their perceptions of the clinician and patient outreach program implemented at our HMO to improve osteoporosis management after a fracture [8]. In general, respondents said that the osteoporosis outreach program overcame many of the problems that are typically associated with the transition from specialty to primary care after

Table 4 System facilitators of osteoporosis management: current and future advice

Current system supports		
Areas of inquiry	Key findings	Illustrative quotes
Osteoporosis Outreach Program	Addresses "gap" in care from time of fracture to PCP visit regarding osteoporosis screening/treatment Provides patients with timely one-on-one information and education on osteoporosis. Provides patients with opportunity to address concerns or barriers to screening and treatment of osteoporosis. Helps standardize osteoporosis care within the system. Relieves time and workload burden for PCPs	Patient: *I received a phone call from the advice nurse...they had determined I had osteoporosis and that I needed to be on Fosamax. I decided to follow though on that.* PCP: *I think the outreach program is useful...definitely a good idea to have a tracking mechanism to find people that are falling through the cracks and making sure that someone is asking questions about whether they have osteoporosis...* Specialist: *I'm glad they included osteoporosis as one of the measures in HEDIS because that was the first one in that area that pertained to us.* Manager: *I think it's a GOOD program and an effective program... The fact that it is a regional program with the same outreach and same support being given regardless of where the patient is paneled is a big deal...*
Other tools for system support – guidelines - orders in EMR	Provides guidance regarding best practices for osteoporosis. Providers question how frequently guideline information is updated. Providers access tools infrequently/decreases familiarity and proficiency. Providers sometimes find accessing tools time consuming so choose not to use them. Order sets are useful for standardizing care and improving involvement of specialists, but need to be simple, clear, efficient, and accessible	PCP: *I really like having the website [guidelines] in there for cases where I am thinking, 'Oh, this is a little odd.' It helps with the things I don't deal with very often.* Specialist: *I have used the guidelines a couple of times, but of course I don't remember how to do it because I don't do it any more.* Specialist: *Our department is trying to set up a smart set [EMR tool] for osteoporosis to make it easier for us to kind of get what the patients need...realizing we are a small piece of that puzzle.* Manager: *If there was... some simple, smooth process that they could just click through it, it would be easy. They [providers] would just be ingrained to do the work. And guidelines are useful....It [guidelines] also brings people's awareness*
Patient health education packet	Easy tool for providers to access and mail to patients. Not all providers are aware of tool. Education tools do not fully address patients' ongoing questions and concerns	Patient: *Maybe that [health education packet] would tell me what can happen as osteoporosis progresses...does it progress or is it a one-time thing?* PCP: *I know about the health education packet, but I forget about it. I probably have not used it as much as I should have* Specialist: *There is an osteoporosis education packet you can send out. I just tell the patient I will be sending them a packet of information regarding osteoporosis, and they typically say, 'thanks.'* Manager: *I don't know how much it [health education packet] is prevention-oriented versus kind of explaining what osteoporosis is and helping to reinforce the need for a bone density scan*
Future system supports/advice		
Areas of inquiry	Key findings	Illustrative quotes
Improved integration of specialist and primary care roles	Create standard protocols for integrating and involving specialists (orthopedists, fracture clinic staff, radiologists, emergency room staff) at the point of fracture. Specialists should provide basic education in osteoporosis and initiate screening or treatment. Specialists should consistently and clearly communicate	PCP: *Asking the patient if they've had a mammogram doesn't take a lot of decision making...a lot of that kind of stuff...can be done by others and osteoporosis screening would be one of them.* Specialist: *I don't feel comfortable starting them on medication or following them on medication, but I can certainly get the ball rolling. We are*

	education and initiation of screening to PCP	*seeing patients for a short period of time and it is an opportunity to catch the patient and maybe get them started.* Manager: *Having people look at patients and not just say, you're here for this one thing. At any time or place where patients are seen...everyone who then touches the patient... could then be focused on what are the things that you can do*
Methods for efficient retrieval and follow-up of records	Suggest placement of diagnosis and key results on the EMR "problem list". Create standard protocol for the consistent placement and identification of osteoporosis diagnosis, screening results, and related lab tests in the EMR. Provide more efficient and effective ways to monitor and treat secondary causes of osteoporosis (such as vitamin D levels)	PCP: *I think one of the most important things is the documentation, because the message gets lost...an encounter gets lost, but as long as it gets documented in the problem list, then I can pull it up—it's permanent.* Specialist: *I think you have a better opportunity...to actually initiate a follow through, because of the computer system... the high risk patients need to be identified—like the yellow dot, red dot system on x-rays—so that patients don't fall through the cracks.* Manager: *We need to do a better job of reducing that variability. Putting systems in place consistently... deciding what needs to be consistent and where can there be variations...variation helps us pilot, learn, innovate, but if we don't have a stable base of consistency... then we're not going to know what the variation results are attributable to*
Education/ Training	Offer providers (primary care and specialists) ongoing education in the areas of osteoporosis care, including updated treatment and medication management options, interpretation of DXA results, greater understanding of issues related to secondary causes of osteoporosis (such as vitamin D levels)	*PCP: These are tests [vitamin D levels] that I don't necessarily order regularly, so that is another reason to have endocrinology involved. One reason primary care doesn't do these tests is because maybe it is kind of out of the scope of our normal practice. Specialist: I think a goal would be kind of an 'osteoporosis for dummies or orthopedists, a kind of flow sheet of fractures, and what labs need to done and ordered.* Manager: *I think it is education. What's the latest ... and keeping them updated on changes*
Optimizing direct outreach programs	Consistently resource direct outreach program Expect and plan for long-term sustainability. Familiarize and share best practices among outreach workers. Create operating procedures but encourage creative use of staff. Broaden the scope of outreach to include long-term follow-up, e.g., medication compliance and patient concerns. Create osteoporosis education opportunities such as class or chat room/Internet support for patients to address ongoing questions/concerns about the condition or treatment options. Expand patient support to primary prevention	Patient: *Once they let you know you have it, I think they should follow up. You went and took the test they told you to, and you are taking the Fosamax like they told you to, but then that is it.* PCP: *I think for me the highest priority for osteoporosis help would be to systematize the direct outreach, and have as few as steps as possible—simplify it, facilitate it, and make it straightforward!* PCP: *My experience with osteoporosis in follow-up is that people fall off fairly rapidly. Getting it initiated is great, but somebody needs to help with the follow-through.* Specialist: *I'm not saying we should take this on without adequate support and resources. I'm just saying I think the writing is on the wall. If we really have our best interests in mind for our patients in reducing hip fractures, then we are going to have to figure out a way to collaborate with primary care.* Manager: *Osteoporosis is a natural because you've got a fracture point that says, okay, there's a good chance that we need intervention here...that was a good place to start...we can expand beyond those who have actually had their new fracture*

a fracture. For example, they said the outreach program relieved the follow-up burden on already overburdened practitioners and largely overcame post-fracture patients getting "lost" in the system. Given that the program was effective in improving care [8] and also was well received, we would recommend broad implementation of similar post-fracture osteoporosis outreach programs.

Respondents also described their perceptions of remaining challenges to, and facilitators of, more-effective secondary prevention of osteoporosis. Their advice should be integrated into future osteoporosis quality improvement initiatives. Respondents stated that the need for outreach would diminish if orthopedic and other specialists who treat acute fractures could initiate osteoporosis management through referral, screening, and/or treatment. They also said that specialists likely would need leadership motivation, cultural change, and additional training to encourage their most effective participation. Respondents stated that useful additions to clinical practice would be administrative and workflow supports to encourage orthopedists' participation in prevention (such as EMR enhancements and training) tailored to the needs of diverse sites.

Our findings are of particular consequence with regard to using electronic health records for patient management. Our HMO has a longstanding (>10 years) and well-integrated EMR; yet, many clinicians report not being adequately facile with accessing patient clinical information. Further inquiry related to ease of use of EMR tools and their integration into clinical care may yield important insights to enhance the usefulness of this technology.

Practitioners highlighted several specific needs related to guideline clarification and training: DXA interpretation; clarification of and counseling techniques for the risks and benefits of treatment, especially in the very old; and vitamin D management. This information should be useful to health care providers and specialty societies planning communication and educational opportunities. Patients and providers supported the need for additional patient outreach and education to ensure understanding and to assist with medication adherence. Given that adherence to osteoporosis medication is generally poor [21], program enhancement in this area is sorely needed to achieve anticipated fracture prevention outcomes.

Our findings mirror those of a Canadian study, the findings of which support the need for a larger role for orthopedists, improved integration of acute fractures, and follow-up osteoporosis care [11]. Others have also supported the need for enhanced provider training [22, 23] and patient education [9, 10, 24] to move past the osteoporosis-osteoarthritis confusion and to enhance understanding of osteoporosis concepts.

This study has limitations. The findings may not be generalizable to other settings. Our study site is a large group practice where physicians are salaried, and physicians in private practice may receive more financial incentives to complete osteoporosis evaluation and treatment. Views of respondents may have differed from those of non-responders, resulting in bias in our findings. However, our response rate to recruitment was reasonable (especially for managers and specialists), diminishing this concern. Respondents were recipients of, or involved in, the outreach program; thus, participants' views may differ from those of individuals without this experience. The original outreach program targeted women included in the United States National Center for Quality Assurance, HEDIS (Health Employer Data and Information Set) quality improvement measure for post-fracture management of osteoporosis. (www.ncqa.org/tabid/346/Defaut.aspx). We, therefore, included women aged 67 or older—younger women and men were not included. Also, the cultural context we found, one of valuing the EMR and care management, may vary significantly by care setting. However, given the pervasive care gaps found in the post-fracture management of osteoporosis [3], the transition problems described are likely common to most models of care.

More research is needed to develop and evaluate improved systems for osteoporosis care to respond to the particular needs of the many types of involved stakeholders. In particular, it would be useful to more fully differentiate the needs of younger and older women from men at risk and create tailored intervention programs. Other possible fruitful interventions to evaluate might include strengthening inpatient and outpatient fracture clinic and emergency room protocols to address osteoporosis management, providing more osteoporosis education to orthopedists during their training and as continuing medical education, developing and strengthening electronic medical record-based decision support for osteoporosis for PCPs and specialists, and expanding patient support to primary prevention.

In conclusion, we believe most of the findings we have highlighted are generalizable and that implementation of similar outreach with enhancements based on the qualitative findings could broadly improve care. Our findings are especially important when viewed within the context of the increasing pressure for health care providers to address gaps in guideline-based care. The findings from this study should be useful to other health care organizations planning osteoporosis quality improvement activities.

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Appendix

Table 5 Key questions from interview guides

Opening	We are trying to understand the views and experiences of clinicians/patients/ health care managers about the management and treatment of osteoporosis.
Patient experience	What does the term "osteoporosis" mean to you?
Clinician roles	What do you see as your role in the evaluation and management of osteoporosis?
	What do you see as being the role of other providers in the evaluation and management of osteoporosis?
Clinician barriers	From your experience, what are the things that get in the way of (or are barriers to) treating/managing osteoporosis?
Clinician facilitators	For the last couple of years this site has had a program to try to encourage bone mineral density measurement and/or initiation of osteoporosis treatment in older women who have had fractures
	Is the Osteoporosis Outreach program useful?
	If so, how?
	If not, why not?
	Suggestions for improving program?
	Are there any other current system supports that you find helpful to facilitate osteoporosis management and treatment?
Patient barriers	From your experience, what are the things that get in the way of (or are barriers to) receiving recommended health care for osteoporosis?
Patient facilitators	Let's talk a little about bone health and preventing fractures or broken bones. For the last couple of years, your health plan has had a program to try to encourage people over the age of 67 who have had broken bones to get a bone mineral density measurement and/or start osteoporosis treatment
	Do you think this program is useful to you?
	Tell me: what are some things you can do to keep your bones healthy?
Close	Tell me the one thing you want to be sure that I include in the report that came from our discussion today regarding the Osteoporosis Outreach program and your experiences with osteoporosis

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