A 63-Year-Old Man With Multiple Cardiovascular Risk Factors and Poor Adherence to Treatment Plans

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Mr P has long-standing hypertension, obesity, and diabetes mellitus and has experienced life-threatening cardiovascular events. Mr P is receiving evidence-based clinical care but has adhered to his medical regimen poorly and remains at considerable risk of future catastrophic cardiovascular events. Practicing evidence-based medicine should be a 5-step process: research uncovers the evidence, clinicians learn the evidence, clinicians use the evidence at every visit for every patient, clinicians make sure patients understand the evidence, and clinicians help patients incorporate the evidence into their lives. Research demonstrates, however, that clinicians do not use the evidence at every visit, patients may misunderstand what took place in the visit, and clinicians are not always effective in helping patients incorporate the evidence into their lives. These failures reflect the difficulty faced by clinicians attempting to address multiple issues while providing sufficient information and engaging in collaborative decision making during a brief clinical visit.

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DR DELBANCO: Mr P is a 63-year-old retired businessman who has been obese for much of his life, has had hypertension and hyperlipidemia for at least 20 years, and was diagnosed as having diabetes about 10 years ago. He is married, with several children and grandchildren. He has commercial health insurance and has sought care at hospital-based primary care practices in Boston.

He and his family note that he has been poorly adherent to various suggested medical regimens for more than 20 years. In 1988, a stroke believed to be hypertensive in origin left him without deficits. In 1996, he was hospitalized for cellulitis of his foot. In 1998, he came to the hospital with crescendo angina, which led to coronary artery bypass graft (CABG) surgery. He has not had chest pain since that time. The same year, Mr P had a pulmonary embolism, recovering uneventfully. He has had intermittent back pain. He currently has disabling hip pain, associated with degenerative joint disease, and he plans hip replacement surgery in the next few weeks. He has had severe erectile dysfunction for about 8 years. Changes in his medications and a trial of sildenafil did not improve sexual function.

Mr P was formerly a heavy user of tobacco but stopped in 1982. He now smokes an occasional cigar. He drinks little or no alcohol, at most 2 beers daily. Over the years he has had little exercise but, as he notes below, had been more active physically in the past 2 years. There is a strong family history of obesity, arteriosclerotic cardiovascular disease, and hypertension. He has been prescribed many medications, including allopurinol, aspirin, atenolol, atorvastatin, amlodipine, furosemide, glyburide, insulin, ibuprofen, lisinopril, and metformin.

On recent examination his blood pressure was 162/94 mm Hg supine at rest, with a large cuff. His pulse was 60/min and regular; he was not tachypneic. With a height of 70 in, he weighed 267 lb (120 kg); over the past 10 years his weight has varied from 245 lb to 280 lb. He has mild, nonproliferative diabetic retinopathy but not hypertensive retinopathy.

No cardiac abnormalities or signs of congestive heart failure were present. The lungs were clear, and examination of the abdomen revealed only abdominal obesity. Ankles demonstrated 2-plus pitting edema; peripheral pulses were

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full. He had hip tenderness and an antalgic gait while using a cane. Neurologic examination results were normal, with no evidence of residual deficit following his stroke.

In recent laboratory evaluations, his glucose control has been good, with a hemoglobin A_{1c} level of 5.7%. Creatinine and serum urea nitrogen levels were normal but he did have microalbuminuria and frequent glycosuria. His calculated low-density lipoprotein cholesterol level was 46 mg/dL (1.19 mmol/L) and his uric acid level was 6.4 mg/dL. Thyroid function was normal, as were liver function test results, serum calcium levels, and complete blood cell count.

MR P: HIS VIEW

Most doctors, they make 5 appointments for 1 o'clock. You can't see 5 people, so you are sitting and waiting and waiting all the time. And that bugs me. And I know there's a lot of people that are always late. I'm just the opposite. You don't mind waiting a few minutes, but when it is getting into the hour waiting for doctors, my blood pressure goes up. So then, when he takes it, it is sky high. And I just blame it on the doctor. But I guess that is just the nature of the beast, being a doctor.

Well, it's hard for me to do the right thing. And I try the best I can. My favorite thing to do is eat. I don't drink. I don't smoke. But I do eat. And it seems like I'm going to a banquet 5 nights a week. That is what it feels like. And I was taught from my family that when you've got 13 mouths to feed, you eat everything on your plate. And that's wrong now. I've got to push the plate back.

I started the gym because my doctor told me I had to lose weight. And the gym turned out to be a good thing. I met people there, and it became an everyday habit, a good habit. I went for a whole year. I was down 60 lb, and the pills were going. And then, in January, a year ago, my hip started bothering me. And I couldn't do the exercise. I couldn't walk. I couldn't go to the gym. And if you don't go to the gym, you start eating more and not losing the weight. And then I was just back to where I was. So I hope after the operation I'm having that I will be back to the gym. That was a big deal, the gym.

MRS P: HER VIEW

He's had many doctors throughout our married life. I think that doctors just need, for one thing, to look at the patients, look them in the eye when they talk to them. A lot of times doctors are so busy, and I understand that they are. You wait sometimes for 45 minutes, and you are in the office for 10 minutes. You like them to look at you and take a moment to say, "Is everything okay with you?"

DR Z: HIS VIEW

He usually comes to see me alone, and we have a few minutes together. And it's pretty hard to get him to really talk, particularly since I'm busy trying to figure out what's been going on since I last saw him. He misses appointments once in a while. I'm never quite convinced he is taking his medicine, although now that his wife has gotten more involved in his care, I'm more confident about that. And I really don't know how much he understands about his illness. His responses to me are a sentence, or just one syllable. And I'm never quite sure what's going on in his head.

I had been saying it for a long time, "You've got to exercise. You've got to eat less. You've got to do this. You've got to do that." I went through the nutrition business and the behavioral modification business, the usual patter song of an internist, and it never really took. And then suddenly he began going to the gym. And his weight melted away. His blood pressure came down. His glycemic control was better. His lipid control was better, and I became a convert. It is very rare that we see people do that.

He hates waiting for me. He's figured out to come early in the morning because that is the first appointment. But he doesn't really take me on about it. I just kind of see it in his face. I apologize and he kind of says, "It's fine." And I hear the "It's fine," and I know it is really not fine.

He is not a patient that pushes back and says, "Why should I do this?" or "Do I have to do this?" When he is pushing back, I think he does it without talking to me. It's kind of a quiet resistance, and he's probably saying, "I think my doc is crazy to have me swallow all these things. And I'm not sure I need them. I feel okay." But in the end, I think he takes quite a lot of the stuff I throw at him and probably gets sick from some of it, periodically. Right now his blood pressure is up, and I'm sure it's because he is taking too many NSAIDs [nonsteroidal anti-inflammatory drugs]. He just jacked that way up when he was away from me, couldn't talk to me, or felt he shouldn't talk to me.

It's awfully hard to juggle a lot of medicines. It's maybe harder to juggle a lot, rather than just a few, because you have to develop a system. His wife is clearly the system by now. I don't think he has a real clue about what numbers he is carrying medically in the results column, but he has a sense of when things are awry and when things are okay. If I asked him to list his medicines, he would turn to his wife for help.

For a while he would see a nurse on our team, and that helped. But it never really took. He wanted to see the doctor. That was the way I think he was socialized, and that was the way he wants to behave. I never could make team care work very well. But we will see what happens in the future.

AT THE CROSSROADS: QUESTIONS FOR DR BODENHEIMER

Has Mr P's care followed principles of evidence-based medicine? How do such principles relate to his course? If patients are not benefiting sufficiently from such care, who is responsible? How can primary care incorporate evidence-based medicine into patients' lives? How can primary care practices improve the care of patients with cardiovascular risk factors? How can we help Mr P do better?

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DR BODENHEIMER: During his 10 years caring for Mr P, Dr Z used evidence-based guidelines.[1-3] He participated in diet and exercise counseling and prescribed proper medications. However, Mr P was in serious trouble before he came to Dr Z, with a history of smoking, hypertension, a poor lipid profile, and a stroke in his 40s. Since primary prevention had failed, Dr Z was playing catch-up, performing secondary prevention.

Although Mr P was cared for using evidence-based medicine, it appears that for Mr P, evidence-based medicine failed. Mr P's blood pressure was uncontrolled during visits in 2001, 2003, 2004, and 2006. His body mass index hovered around 38, well above the obesity threshold of 30. Between 2004 and 2006, his hemoglobin A_{1c} level fluctuated between 5% and 8.8%. His total cholesterol level rose from 132 mg/dL (3.42 mmol/L) in 2004 to 256 mg/dL (6.63 mmol/L) in 2005, decreasing to 118 mg/dL (3.06 mmol/L) in 2006. While Mr P was treated according to the evidence, it is clear that evidence-based medicine was not consistently successful in his case.

Why Does Evidence-Based Medicine Often Fail?

Mr P's experience is hardly unique. National studies show that evidence-based guidelines for cardiovascular risk factor reduction, which have been well-researched and widely disseminated to the nation's physicians, often fail. Sixty-five percent of people with hypertension have poor blood pressure control,[4] 62% with elevated low-density lipoprotein cholesterol levels have not attained lipid-lowering goals,[5] and 63% with diabetes have a hemoglobin A_{1c} level of more than 7%.[6]

For many clinicians, evidence-based medicine is a 2-step process: research uncovers the evidence and clinicians learn the evidence. For patients to benefit, however, clinicians must apply the evidence at multiple visits, patients must understand the recommendations, and patients must incorporate the practices into their lives.

Practicing evidence-based medicine should be a 5-step process:

- Step 1: Research uncovers the evidence.
- Step 2: Clinicians learn the evidence.
- Step 3: Clinicians use the evidence at every visit for every patient.
- Step 4: Clinicians make sure that patients understand the evidence.
- Step 5: Clinicians assist and encourage patients to incorporate the evidence into their lives.

Once these things are done, the responsibility shifts to the patient. But if we as clinicians stop after step 2 and do not perform all 5 steps, we have failed, or the system in which we practice has failed us and our patients.

How Is the US Health Care System Performing on Steps 3, 4, and 5?

Step 3. Clinicians do not use the evidence at every visit for every patient. In many cases, the unsatisfactory intermediate outcomes for patients with diabetes, hypertension, and hyperlipidemia are related to physicians failing to consistently apply evidence-based principles. In a national evaluation of physician performance on 439 process indicators for 30 medical conditions plus preventive care, patients received only 55% of recommended care.[7] While outcome measures involve the actions of both physicians and patients, process indicators are more closely associated with physician performance.

Step 4. Clinicians often fail to inform patients about the evidence. A 2002 national survey found that 55% of patients with diabetes reported receiving diabetes education.[8] In an audiotaped study of 336 medical encounters with 34 physicians, the physicians devoted an average of 1.3 minutes to giving information, although they estimated that they devoted an average of 8.9 minutes to this activity. Eighty-eight percent of the information was worded in technical language.[9] While physicians frequently attribute medication nonadherence to patient behavior, in fact, 3 of 4 physicians in 1 study failed to give patients clear instructions on how to take their medications.[10,11] Clinicians may not be spending the time addressing patients' concerns, either. In a study of 264 audiotaped visits to family physicians, patients making an initial statement of their problem were interrupted after an average of 23 seconds. In 25% of the visits, the physician never asked the patient for his or her concerns at all.[12]

Three separate studies come to conclusions that can be summarized as the "50% rule." One found that 50% of patients leave an office visit not understanding what they were told by the physician.[13] In another study, when physicians asked patients to restate the physician's instructions, the patients responded incorrectly 47% of the time.[14] A third study reported that 50% of patients, when asked to state how they were supposed to take a prescribed medication, did not understand how the physician had prescribed the medication.[15] Mr P, when asked to state what medications he was taking, was unable to do so. His wife, in contrast, understood precisely how the medications were prescribed. For the estimated 90 million adults with limited health literacy, physicians need to take particular care in making their advice understandable.[16]

Step 5. Clinicians often do not assist and encourage patients to incorporate evidence-based advice into their lives. According to a study of more than 1000 audiotaped visits with 124 physicians, patients participated in medical decisions only 9% of the time.[17] While half of patients surveyed preferred to leave final decisions to their physician, 96% wanted to be offered choices and to be asked their opinion.[18] Patients are more likely to be active participants in their care when their physicians encourage such participation.[19]

A participatory relationship between patient and physician is one of the most successful factors promoting healthy behaviors.[20,21] In a study of 752 ethnically diverse patients, information giving and collaborative decision making were associated with better adherence to medications, diet, and exercise.[22] In an intervention study, patients encouraged to participate more actively in the clinical visit reduced average hemoglobin A_{1c} levels from 10.6% to 9.1%, while he-

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moglobin A_{1c} levels for controls increased from 10.3% to 10.6% ($P < .01$).[23] For patients with diabetes, significant associations exist among information giving, participatory decision making, healthier behaviors, and better outcomes.[24-26] A participatory relationship between patient and physician appears to be the most important factor promoting medication adherence. The more actively the patient is involved, the higher the level of adherence and the greater the chance that the patient engages in healthy diet and exercise behaviors.[11,27,28]

It seems that Mr P did not agree with some clinical decisions made by Dr Z, even though those decisions were based on evidence. Mr P clearly stated, "One of my goals is to get rid of all my pills." He understood that he needed the pills but he did not want them and, accordingly, did not take them regularly.

Why Is Evidence-Based Medicine Not Consistently Incorporated Into Patients' Lives?

Between 62% and 65% of patients in the United States with hypertension, elevated cholesterol, and diabetes do not have these conditions under good control.[4-6] Is this a patient problem, a physician problem, or a system problem? The problem cannot be corrected without knowing.

Poor disease control should not be attributed to patients if physicians are failing—as the above discussion suggests—to practice evidence-based medicine at every visit for every patient,[7] to impart information in a manner that patients can understand,[10-15] and to make decisions collaboratively with patients who prefer this form of decision making.[17,19] If not a patient problem, are these failings a physician problem or a system problem? Many clinicians are working in a rushed atmosphere permeated by competing demands; the greater the number of competing demands in visits with patients with diabetes, the poorer the glycemic control.[29] It is likely that these system problems are frequent contributors to poor disease control.

Physicians may fail to use evidence-based guidelines at every visit for every patient,[7] to provide adequate information to patients,[10-15] and to engage in collaborative decision making[17,19] because they do not have time. Mrs P confirmed that lack of time was a factor in Mr P's care: " . . . you wait sometimes for 45 minutes and you are in the office for 10 minutes." The average duration of primary care physician visits by established patients is 16 to 18 minutes,[30-32] and the tasks primary care physicians must accomplish are expanding rapidly. Caring for diabetes, for example, is far more complex and time-consuming than a decade ago.[33] It has been estimated that it would take a physician 7.4 hours per working day to provide all recommended preventive services to a typical patient panel[34] and an additional 10.6 hours per day to provide high-quality chronic care.[35] Wagner introduced the concept of "tyranny of the urgent." In visits with multiple agendas, acute concerns crowd out chronic care management.[36] Consistent guideline-compliant care provided in the standard visit is beyond the reach of most primary care physicians.

Primary care practices in England with longer visit times scored significantly better on quality indicators for diabetes, asthma, and coronary heart disease than practices with shorter visit times.[37,38] Shorter primary care visits in the United States provide fewer preventive services and health education and score lower on measures of patient satisfaction and patient-physician relationship.[39,40]

British physicians do not necessarily spend more time with patients (5-9 minutes scheduled on average) than US physicians (10-20 minutes),[40] but British practices use nurses to perform preventive and chronic care functions, many visits are for prescription refills only, and sicker patients may be cared for at home. Two separate studies found that patients are less effective in information seeking during visits lasting less than 18 minutes.[41,42] Length of the office visit is a major predictor of patient participation in clinical decision making[43]; 1 study found that visits need to be at least 20 minutes to involve patients effectively in decisions.[44]

In summary, the 15- to 18-minute physician visit and resulting lack of patient participation and education may be a primary reason why more than 60% of patients with hypertension, elevated cholesterol levels, and diabetes have poor control of their condition.

Incorporating Evidence-Based Medicine Into Patients' Lives

A new paradigm for care of patients with chronic conditions and risk factors has achieved broad acceptance among health care institutions in the United States and many other nations: the chronic care model.[45] This model emphasizes that good chronic care requires a "prepared, proactive practice team interacting with an informed, activated patient."

The chronic care model teaches that a fundamental chronic care task of the practice team is self-management support—what health care givers do to assist and encourage patients to become informed and activated.[46] The Institute of Medicine defines self-management support as "the systematic provision of education and supportive interventions to increase patients' skills and confidence in managing their health problems, including regular assessment of progress and problems, goal setting, and problem-solving support."[47]

I would include in self-management support a number of activities that require a team to

- Give information.
- Teach disease-specific skills.
- Negotiate healthy behavior change.
- Provide training in problem-solving skills.
- Assist with the emotional impact of having a chronic condition.
- Provide regular and sustained follow-up.
- Encourage active participation in the management of the disease.

While this model focuses on the informed, activated *patient*, Mr P's informed, activated wife reminds us that for many patients the goal of chronic care management should be the

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informed, activated *family*. Mr P, who rarely asked questions of his physician and who, for much of the time, placed his medical care near the bottom of his life's agenda, appeared to be an uninformed, passive patient. However, he became highly active and successful in managing his condition through his exercise program at the gym, during which time he lost substantial weight and brought his multiple risk factors under control. More recently, he was forced to confront a serious barrier: the incapacitating pain in his hip. Patients with diabetes who have chronic pain have more difficulty following a diet plan, engaging in physical activity, and regularly taking their medications.[48] In addition, he may be experiencing depression; patients like Mr P who have lost motivation should be evaluated for possible depression.

As Mr P demonstrates, even if information giving is optimal, as presumably is the case for him, it is insufficient to improve outcomes. A review of diabetes patient education found that in 33 of 46 studies, education improved patients' knowledge about their condition, but in only 18 of 54 studies did patient education improve glycemic control.[21] Sixteen randomized controlled trials of patient education on hypertension found that education alone is not associated with reductions in blood pressure.[49] A review of 12 asthma studies concluded that patient education alone neither improved asthma-related symptoms nor reduced asthma-related emergency department visits.[50] Nor does education by itself increase the extent to which patients take prescribed medications.[51]

Teaching disease-specific skills may be the most important component of self-management support. For example, home glucose monitoring by itself does not appear to improve glycemic control in patients with type 2 diabetes who are taking oral medications, and its efficacy is questionable in those treated with insulin.[52] Measuring, recording, and reporting one's glucose levels are not sufficient: one must understand the meaning of the glucose values and how to adjust diet, exercise, or medication doses in response to those values. Patients with type 2 diabetes who learn to self-regulate insulin doses based on home glucose levels have better glycemic control than those who do not self-regulate.[53]

Healthy behavior change is a self-management support activity still searching for conclusive evidence. Some literature suggests a benefit if patients choose a goal and agree on a concrete action plan that moves toward the goal.[54] A review of 92 studies of diet behaviors found that goal setting or action planning was associated with eating less fat, and more fruits and vegetables.[55] A separate review found 32% of 28 studies supporting the use of goal setting or action planning for diet and physical activity.[56] The American Diabetes Association, American Association of Diabetes Educators, and American Heart Association recommend goal setting as a component of cardiovascular risk reduction.

Sustained regular follow-up of lifestyle and medication behaviors is necessary in self-management support. Patients with diabetes who have regular follow-up have better hemoglobin A_{1c} levels than patients without follow-up.[57] The benefits of self-management support for patients with diabetes diminish over time without regular follow-up, and the total time caregivers spend with patients correlates with glycemic control.[58] Similarly, regular follow-up is necessary for hypertension management,[49] and reviews of trials of patients with heart failure discharged from the hospital find that nurse-led follow-up is associated with large reductions in heart failure readmissions and, in some cases, reductions in mortality.[59,60]

Continuity of care and trust in the physician are also critical factors in self-management support. A review of 41 articles examining the association between continuity of care and 81 care outcomes (including preventive and chronic care outcomes, hospitalization rates, and quality of the patient-physician relationship) found that continuity was associated with improved outcomes in 51 of the 81 case outcomes.[61] Patient trust in the physician has been associated with improved medication adherence, better health-related behaviors, and continuity of care.[62]

How Can Primary Care Practices Offer Self-management Support?

If primary care is truly centered on the 15- to 18-minute clinician visit, how is it possible to offer the time-consuming components of self-management support, including regular and sustained follow-up? Additional visits with health educators, behavioral health counselors, and pharmacists would certainly help. But as Mr P reported, many patients do not like to seek medical care both because of other priorities in their lives and because receiving medical care is not how most people want to spend their day. The best time to reach patients is as part of their regular clinic visit, expanding the 15-minute visit into a longer encounter that allows patients like Mr P to benefit from self-management support provided as "one-stop shopping."

Teams in larger primary care practices generally have several clinicians; for instance, nurses, health educators, pharmacists, social workers, medical assistants, and receptionists. A "teamlet" is a small subset of this larger team. It consists of a clinician and 1 other person. The other person would ideally be a nurse or health educator, but in most primary care practices the other half of the teamlet is more likely to be a medical assistant. To perform self-management support, the medical assistant would need additional training in teaching disease-specific skills, working with patients on behavioral goals and action plans, and performing regular telephone or electronic follow-up.

In this model, the 15-minute physician visit is expanded to a longer encounter in which the medical assistant would spend time post visit with the patient. In this visit, the upgraded medical assistant would make sure the patient understands everything that took place in the visit, would teach and reinforce disease-specific skills, and would engage the patient in behavioral goal setting and action plans.

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Between visits, the medical assistant would perform telephone or electronic follow-up to check on behavioral goals and medication use. Some primary care practices in the United States have instituted elements of this model, though no studies have yet been done to evaluate its effectiveness, and its widespread adoption would require reform of primary care payment to reimburse self-management support activities.[63]

Was Mr P a Nonadherent Patient?

On being asked, "Why are so many of your hypertensive patients poorly controlled?" the average community physician replies, "Because they're noncompliant."[11] If one asks an academic physician the same question, the standard answer is, "They are nonadherent." In fact, the definitions of compliance and adherence are identical,[64,65] and both concepts may be counterproductive.[66] Are patients nonadherent if they are among the 50% who do not understand what happened in the physician visit?[13] Are patients nonadherent if they are not engaged in decisions about their care[16] and may not agree with what the physician ordered? Moreover, are patients nonadherent with an exercise program if they live in a neighborhood with a high homicide rate and nowhere to exercise?

A helpful approach is simply to say, "This patient is not taking his/her medications," and to probe for the reasons why. Is it cost, medication discordance (the patient not understanding how the medication should be taken[15]), adverse effects, lack of belief that the medication will improve one's life, or excessive numbers of pills with complex dosing schedules? Solving the problem is better served by probing rather than by affixing the label of nonadherence.

Evidence-based medicine did not fit well with Mr P's life goals. Mr P worked hard, enjoyed life, liked to eat, and abhorred his pills. For most of his life he has chosen to be a passive, uninformed patient. If his clinical team (1) made sure he understood the best evidence regarding his disease management and (2) worked with him collaboratively to look for areas of agreement on how to balance his life goals with clinical goals, then Mr P's failure to incorporate the evidence into his life is his responsibility, his choice. Most clinicians would label Mr P nonadherent; an alternative would be to say that his life priorities, and the ways in which he chooses to spend his time, differ from the goals of his clinical team. For Mr P, like many patients with diabetes, dealing with his health problems could consume a couple of hours per day.[67] Self-management support—providing information, conducting skills training, negotiating action plans to encourage achievable behavior change, assisting in problem-solving, addressing the emotional burden of chronic disease, and providing regular follow-up—assists and encourages patients to bring their life priorities into closer approximation with their clinician's goals. Sometimes it succeeds, sometimes not.

The fascinating thing about Mr P is that, for whatever reason, he temporarily transformed himself from an uninformed passive patient to an activated patient when he embraced physical activity in the gym, thereby incorporating evidence-based medicine into his life and improving his weight, blood pressure, hemoglobin A_{1c}, and cholesterol. The story of Mr P highlights that the activated patient is a major determinant of chronic disease outcomes. Finding what helped him motivate himself and trying to reproduce that could help him regain a sense of control over his disease.

CONCLUSION

Many patients do not achieve adequate control of cardiovascular risk factors, in part because the systems in which many physicians work do not allow sufficient time for physicians to provide evidence-based medicine at every visit for every patient, to make sure that patients understand the evidence, and to assist and encourage patients to incorporate the evidence into their lives. To remedy this situation, primary care practices need to be held responsible for performing these activities and reimbursed adequately to allow the practices to build care teams who can work with physicians to carry out this responsibility.

QUESTIONS AND COMMENT

Dr Delbanco: Do you think computers in the future might be those "teamlet" members and have some role? And who's going to pay for these teamlet players? Should we get the money from the cardiologists, the gastroenterologists, or from President Bush? You're going to say it's not an incremental cost, and I won't believe it.

Dr Bodenheimer: There are a lot of barriers to doing teamlets. One is that it means changing job descriptions, and changing job descriptions is not easy to do. It means training. But the reason that this teamlet project is not just a figment of my imagination is that there are people who are actually doing large parts of it.

An interesting example is the University of Utah health system, using medical assistants in an expanded role. Another organization that's doing a lot of this type of primary care restructuring is Health Partners Medical Group in Minnesota. They're actually doing previsit, visit, postvisit, and between-visit care.[63]

Regarding the costs of this model, let me give the example of Neighborhood Healthcare, a community health center in San Diego. As a federally qualified health center, it receives an augmented rate for patients on Medicaid. The medical director, who also holds a master's of business administration, found that if each physician sees 1 additional Medicaid patient per day at this augmented payment rate, that pays for the extra medical assistants needed.[63] Each primary care practice has to see whether there is a business case for doing a teamlet-like model, and some people are finding there is. It's not an easy problem, though. It's a huge challenge.

I think the computer could take the place of some self-management support functions in many circumstances. Probably 50% of visits to the physician are unnecessary. They're unnecessary for the patient, unnecessary for the physician,

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and could be done electronically—much faster, much more convenient for the patient, and shorter for the physician.

You can do a lot of self-management support, and you can do a lot of follow-up work on the computer. But some people really need the face-to-face interaction with people. You certainly need that part of the time. But some people are very comfortable doing things by computer.

QUESTION: Does your self-management and patient activation model work across the spectrum of literacy and education in patients?

DR BODENHEIMER: We did a small study of behavior change action plans in 4 safety net and 4 private practices.[54] We called the patients after they had done action plans with their physician. This was all self-reported, so it's not gold standard research. The percentage of people actually doing some behavior change based on the action plan they had agreed on with their physician was identical between the safety net and the private practices. We always think that people of lower socioeconomic status and people with lower health literacy can't do these things. They can.

QUESTION: Discontinuity of care disrupts relationships. How do you handle that?

DR BODENHEIMER: The problem with continuity of care, especially in an academic clinic, is that physicians are here one day and gone the next. Could you have continuity with a teamlet, with patients seeing the teamlet as their continuity provider? It depends a lot on who the other person on the teamlet is. If you have nurses, that's perfect. But most primary care practices can't afford nurses, so we're trying different kinds of caregivers.

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CLINICAL CROSSROADS
UPDATE

A 57-Year-Old Man With Osteoarthritis of the Knee

In a Clinical Crossroads article published in February 2003,[1] Jess H. Lonner, MD, discussed the epidemiology, treatment options, and potential complications of osteoarthritis of the knee. The discussion focused on Mr V, a 57-year-old athlete with a history of persistent knee pain spanning 30 years. Mr V was an avid long-distance cyclist, estimating his annual cycling distance to be approximately 7000 miles. His pain had escalated gradually until it became difficult for him to stand for long periods or bend down to garden. His pain was controlled with 500 mg/d of naproxen. Radiographs of the left knee in 1999 revealed marked tricompartmental osteoarthritis with prominent osteophyte formation and severe joint space narrowing. Mr V received disparate therapeutic recommendations ranging from ongoing physical therapy to total knee replacement. At the conference, Mr V wondered if he should continue long-distance cycling and also questioned whether and when he should have total knee replacement surgery.

MR V

I decided to have the replacement in my left knee. The surgery went very well and my recovery was relatively quick. I had the surgery at the end of August 2003 and I was back to bicycling the following summer. Obviously, I was performing far below my full physical capacity, but I was out and about. The December following the operation, I was already hiking, with my physician's permission.

I did physical therapy with a visiting therapist who came 2 or 3 times a week, and that really helped a lot. Shortly after that, I was walking on crutches. Afterward, I went to another therapist and she helped me a great deal.

I just got back to riding in late April, after I had a bicycle accident and fractured my neck, which put me on the sidelines for a long time. All things considered, I'm riding pretty well, but a limited amount. I would say in an average week, I bike anywhere between 150 and 175 miles. Most of the time, I don't think about my replacement knee, it's just part of me. Obviously, I don't push the left leg as hard as I push the other leg. There are certain movements where I know my limitations, like bending my knee all the way—I can't do that anymore. But it works well. I've been hiking some technical terrain, and I know how far I can push it.

In general, my health is very good now. Some time ago, I was diagnosed with osteoporosis and I developed some arthritis in my right knee. According to my doctor, it is nothing to be concerned about right now. I was uncomfortable for a few weeks, and then it went away, and now I don't have any more pain.

I'm taking Fosamax [alendronate], 70 mg/wk, and a multivitamin.

DR LONNER

Mr V's experience is illustrative of several important points. First, while we as clinicians advise patients regarding what we per-

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