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Technology for Patient-centered,
Collaborative Care

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Preface

In the landmark report, *Crossing the Quality Chasm*, the Institute of Medicine summarized a disturbing terrain of defects in American healthcare quality, as well as an ambitious and promising agenda for redesign. The majority of both the defects and the redesign ideas swirl around one recurring theme: that our system of care, built in fragments and designed for reaction, is frustratingly unable to meet the needs of people that extend over time and place. The most vulnerable victims are the chronically ill, whose journey through the years touches healthcare in many places at many times. But, they are not the only victims. Even well adults know how erosive an uncoordinated system can be of both their time and their safety. Systems without plans and memories cannot serve healthcare well.

The chasm will not be closed without restructured care. The title of this supplement correctly names the key design criteria: “Patient-centered” and “Collaborative.” Patient-centered care will be customized, “24/7,” proactive, inclusive of loved ones (when wanted by the patient), transparent, and guaranteed. It will use many ways, not just visits, to extend help; will build patients’ skills in self-management; will employ and improve supports for authentic shared decision making; and will track patients’ status through time to learn about the effects of and problems with care and treatment plans.

Collaborative care will create and support teams where they should exist, help develop shared skills and affection among team members, keep information flowing freely to wherever it can be of use, and—absolutely—include patients in everything they wish to be included in.

I suppose we can make progress toward patient-centered, collaborative care without technology, but why would we try? The potential of modern communication, knowledge management, and expert decision-support technologies is immense, and hardly harnessed at all yet in healthcare as a system. We have a very long leg in *biotechnology* but a very short one in *system technology*, and therefore we let our patients and each other down far, far too often. The result—care that is neither patient-centered nor collaborative—is at the heart of the “quality chasm.”

In this issue of the journal, the reader will find many bright lights to follow. The arena of technological innovation to improve patient-centeredness and coordination is rapidly getting populated with visionaries and early adopters. Now, this good work can and should head for the mainstream.

—**Donald Berwick, MPP, MD**
*President and CEO of the Institute for
HealthCare Improvement*

[AQ1]

An Introduction to Technology for Patient-centered, Collaborative Care

L. Gordon Moore, MD; John H. Wasson, MD

Abstract: “Patient-centered, collaborative care” is healthcare jargon. But underlying the jargon is the principle that a patient who receives such care strongly agrees that “I receive exactly the healthcare I want and need exactly when and how I want and need it.” Currently only about 1 in 4 Americans who have adequate financial resources can make this claim. Think of a pyramid. At the apex is the highest level of “patient-centered, collaborative care.” At the base are measures about “what’s the matter” (from the clinical perspective) and “what matters” (from the patient perspective). As patients and clinicians act collaboratively on these measures, they climb closer to the apex of the pyramid. Given the realities of healthcare in the United States, should busy professionals take time to think about ways to climb pyramids? In this “Introduction” we describe why the answer to this rhetorical question ought to be “yes.” In the articles that comprise this issue, readers will learn how technology that supports patient-centered, collaborative care can help bridge the gap between desirable goals and limited time. All the authors understand technology (such as hardware and software), and the way humans use the technology (called *techne*) will not overcome the many obstacles to the attainment of patient-centered, collaborative care. Nevertheless, we are hopeful that the examples described in these articles suggest ways that significant progress toward patient-centered, collaborative care can be made. The articles are practical. The results are persuasive. It is worth the climb! **Key words:** *collaborative care, disease management, patient-centered care, practice improvement*

WHAT IS PATIENT-CENTERED, COLLABORATIVE CARE?

Healthcare produces jargon. The term *patient-centered* care seems to have its origins as a reaction to paternalistic “doctor-centered” health services (Davis et al., 2005; Wagner et al., 2005). “Collaborative care” results when doctors and members of the “healthcare team” actively engage patients in “evidence-based” decision making and management based on what matters to the

patients. Patients should become better “self-care managers” as a result of collaborative care. Collaborative care—almost synonymous with a “productive interaction”—is associated with improved patient outcomes (Bodenheimer et al., 2002; Renders et al., 2001; VonKorff et al., 1997; Wagner et al., 1996a, 1996b).

Regardless of jargon, patients who experience the best healthcare possible—the best “patient-centered, collaborative care” possible—should strongly agree that they are receiving “exactly the care they want and need exactly when and how they want and need it.” Only about 25% of adult Americans (and only 12% of low-income Americans) strongly agree that they have received “patient-centered, collaborative care” defined in this way.

What is it that differentiates those who strongly agree from those who disagree that their care is exactly what they want and need exactly when and how they want and need it?

From the Ideal Medical Care of Brighton, Rochester, NY (Dr Moore); and Dartmouth Medical School, Hanover, NH (Dr Wasson).

This research was supported by grants from The Commonwealth Fund, The Robert Wood Johnson Foundation, and the Physicians Foundation for Health System Excellence. We thank our colleagues at the Institute for Health Care Improvement.

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Table 1. "I receive exactly the care I want and need exactly when and how I want and need it"[™]

	25% of adult Americans who strongly agree, %	25% of adult Americans who disagree, %
I have one person I think of as my personal doctor or nurse	95	60
It is very easy for me to get medical care when I need it	85	10
Most of the time, when I visit my doctor's office, it is well organized, efficient, and does not waste my time	80	20
The information given to me about health problems is very good	80	25
I am confident that I can manage and control most of my health problems	75	15

*Respondents are aged 19-69 years, September 2005-April 2006. From HowsYourHealth.org.

Table 1 shows that no single attribute of care is uniquely associated with "patient-centered, collaborative care." There is no single thing a doctor, an office practice, or a healthcare system can do to guarantee patient-centered, collaborative care. Many things must be done well.

HOW IS PATIENT-CENTERED, COLLABORATIVE CARE ATTAINED?

This issue of the *Journal of Ambulatory Care Management* assumes that practice redesign is necessary for the attainment of patient-centered, collaborative care. But this is not the focus of the articles. Rather, the articles emphasize how emerging technologies and approaches based on technologies make patient-centered, collaborative care more easily attainable.

Figure 1 is a useful way to think about how an outstanding office practice might get to the top of the pyramid. . . that is how a practice can attain patient-centered, collaborative care.

To improve an office practice, it has to know how it is performing. Performance measures should include the "usual suspects" on which all clinician focus such as a blood glucose level in a diabetic or the third next avail-

able appointment. These measures of "what is the matter?" are located in the lower left-hand half (or the clinical side) of the pyramid.

But the practice should also know "what matters" to patients. For example, the utility of information they receive, their experiences with access to care, and their confidence to manage and control health problems? These measures are located in the lower right hand (the patient side) of the pyramid.

To attain the desired result of patient-centered, collaborative care, the patients and healthcare professionals need to take action. On the practice side of the pyramid, the final common pathway of all measurement should lead to practice redesign on the basis of a comprehensive model of care: 2 widely disseminated models are the "Chronic Care" and the "Idealized Design of Clinical Office Practice" models. The former is based on an analysis of evidence, the latter on an empiric distillation of experience in redesigning office practice.

But practices that emphasize a redesign that mechanistically delivers care independent of what matters to patients will never attain a high-level excellence. For example, easy access to services not focused on what matters to patients is neither patient-centered nor collaborative. It is access to what healthcare professionals want to deliver.

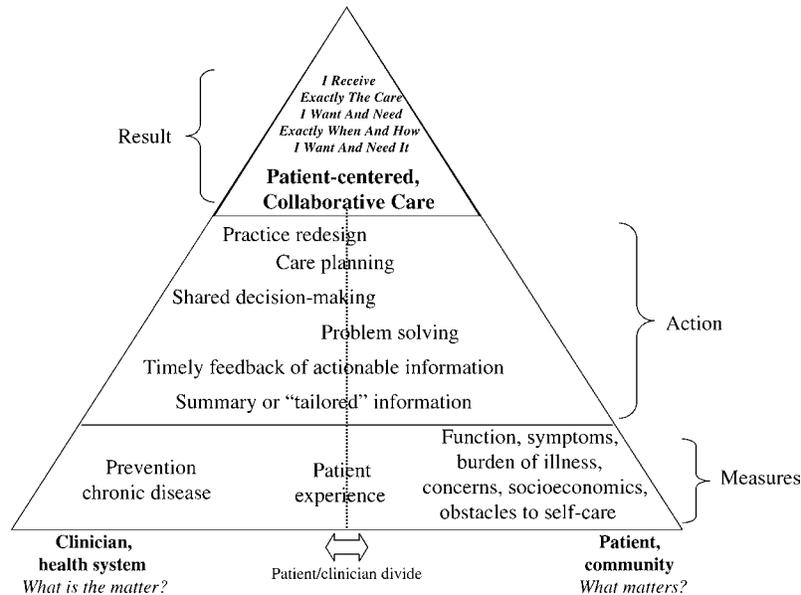


Figure 1. Schematic of measures and actions associated with patient-centered, collaborative care.

Examples of actions that ultimately embed what matters to patients into practice redesign are included in the figure. Many of the actions are greatly facilitated by technologies such as automated registries and patient portals. When clinicians take seriously what matters to patients and the patients receive information tailored to their needs, there is some improvement in care. The patients and clinicians are “on the same page.” When the patients are helped to use the information to better solve the problems that matter to them, their outcomes are improved. Together with the clinician, these “activated” patients are better able to engage in “shared decision making” and plan care. They are nearing the top of the pyramid.

THE ARTICLES IN THIS ISSUE

Patient-centered healthcare is a good thing. Collaborative healthcare is a good thing. Preventive, chronic, and acute healthcare services are all good things. Yet, estimates of the time a clinical practice might have to spend to deliver all these “good things” can easily consume most available hours of a 24-hour

day (Ostbye et al., 2005; Stange et al., 1998; Yarnall et al., 2003).

Something has to give. Unfortunately, the results of national polls in 2005 tell us what gives; for the first time in the history of such polls, more Americans felt negatively about healthcare than those who felt positively. And many clinicians do not seem to enjoy the work very much either (Sox, 2003).

This issue of the *Journal of Ambulatory Care Management* examines one partial solution to the dilemma of “so much good to do and so little time to do it.” In this issue, the authors describe how technology that supports patient-centered, collaborative care can help bridge the gap between desirable goals and limited time.

In the first article, the authors use a large national data set in which Americans report their needs and the services they have received. Using the same data source, the second article examines how a planned, step-care management approach for persons with chronic diseases is likely to be much more time-efficient and cost-efficient than current care.

The challenge for a clinical practice is to garner the insights from the first 2 articles and

make them operational in the day-to-day work. The third article in the series describes how a very low overhead, high technology practice seems to be attaining very high levels of patient-centered, collaborative care. A fourth article examines how patients and their doctors use technology to enhance communication, minimize waste, and even avoid some office visits.

Just as technology expands the opportunities for clinical practice, technology can also expand the boundary of clinical practice from the office or hospital to the community. In the final articles of this series, the authors describe how they are using assorted technologies for their employees (Engaging

Quad Graphics Employees in Improving Their Health and Healthcare) and the community (Employer-led Business Coalition Vision for Action).

All the authors understand all too well that technology (such as hardware and software) and the way humans use the technology (called *techne*) will not overcome the many obstacles to the attainment of patient-centered, collaborative care. The "Post Script" on health disparities emphasizes this point (Health Disparity and Collaborative Care). Nevertheless, we are hopeful that the examples described in these articles suggest ways that significant progress toward patient-centered, collaborative care can be made.

REFERENCES

- Bodenheimer, T., Wagner, E. H., & Grumbach, K. (2002). Improving primary care for patients with chronic illness. *JAMA*, 288, 1909-1914.
- Davis, K., Schoenbaum, S. C., & Audet, A. (2005). A 2020 vision of patient-centered care. *Journal of General Internal Medicine*, 20, 953-957.
- Ostbye, T., Yarnall, K. S., Krause, K. M., Pollak, K. I., Gradison, M., & Michener, J. L. (2005). Is there time for management of patients with chronic diseases in primary care? *Annals of Family Medicine*, 3, 209-214.
- Renders, C. M., Valk, G. D., Griffin, S. J., Wagner, E. H., Eijk Van, J. T., & Assendelft, W. J. (2001). Interventions to improve the management of diabetes in primary care, outpatient, and community settings: a systematic review. *Diabetes Care*, 24(10), 1821-1833.
- Stange, K. C., Zyzanski, S. J., Jaen, C. R., Callahan, E. J., Kelly, R. B., Gillanders, W. R. et al. (1998). Illuminating the 'black box': A description of 4454 patient visits to 138 family physicians. *Journal of Family Practice*, 46(5), 377-389.
- Sox, H. C. (2003). Saving office practice. *Annals of Internal Medicine*, 139(3), 227-228.
- VonKorff, M., Gruman, J., Schaefer, J., Curry, S. J., & Wagner, E. H. (1997). Collaborative management of chronic illness. *Annals of Internal Medicine*, 127(12), 1097-1102.
- Wagner, E. H., Austin, B. T., & VonKorff, M. (1996a). Organizing care for patients with chronic disease. *Milbank Quarterly*, 74, 511-544.
- Wagner, E. H., Austin, B. T., & VonKorff, M. (1996b). Improving outcomes in chronic disease. *Man Care Quarterly*, 4, 12-25.
- Wagner, E. H., Bennett, S. M., Austin, B. T., Greene, S. M., Schaefer, J. K., & Vonkorff, M. (2005). Finding common ground: Patient-centeredness and evidence-based chronic illness care. *Journal of Alternative and Complementary Medicine*, 11(Suppl. 1), S7-S15.
- Yarnall, K. S. H., Pollak, K. I., Ostbye, T., Krause, K. M., & Lloyd, M. J. (2003). Primary care: Is there enough time for prevention? *American Journal of Public Health*, 93(4), 635-641.

Patients Report Positive Impacts of Collaborative Care

**John H. Wasson, MD; Deborah J. Johnson, BA;
Regina Benjamin, MD, MBA; Jill Phillips, MSN, ANP;
Todd A. MacKenzie, PhD**

Abstract: *Collaborative Care* refers to a partnership between healthcare professionals and patients who feel confident to manage their health conditions. Using an Internet-based assessment of health needs and healthcare quality, we surveyed 24,609 adult Americans aged 19 to 69 who had common chronic diseases or significant dysfunction. In these patients, we examined the association of Collaborative Care with specific measures for treatment effect, disease control, prevention, and economic impacts. These measures were adjusted for respondents' demographic characteristics, burden of illness, health behaviors, and overall quality of healthcare. Only 21% of respondents participated in good Collaborative Care, 36% attained fair Collaborative Care, and 43% experienced poor Collaborative Care. Regardless of overall care quality or the respondents' personal characteristics, burden of illness, or health behaviors, good Collaborative Care was associated with better control of blood pressure, blood glucose level, serum cholesterol level, and treatment effectiveness for pain and emotional problems. Some preventive actions were better, and some adverse economic impacts of illness were mitigated. **Key words:** *collaborative care, health assessment, Internet health assessment, patient centered, quality of care, self-management*

A PARTNERSHIP between patients who manage their own conditions and healthcare professionals is called Collaborative Care (Bodenheimer et al., 2002a, 2002b). *Collaborative Care* refers to involvement of patients in the management of their care and the provision of information by healthcare professionals to support self-care. Productive inter-

actions between patients and health professionals may be associated with improved patient self-care, better clinical outcomes, and reduced costs (Bodenheimer et al., 2002b; Greenfield et al., 1985; Newman et al., 2004; Wanless, 2002; Warsi et al., 2004).

Despite the inherent appeal and value of Collaborative Care and productive patient-professional interaction, barriers to implementation are daunting. Healthcare professionals often give insufficient information to patients and may even react negatively to patients who seek involvement in their own care (Blendon et al., 2003; Braddock et al., 1999; Gotler et al., 2000; Kravitz et al., 2002, 2003; McGlynn et al., 2003; Scott et al., 2001). The US healthcare system often adds an adversarial dimension to the relationship (Relman, 2005). Health system design and payment structures often do not support Collaborative Care (King & Wheeler, 2004; Rogers et al., 2005).

In this report, we use the responses of approximately 25,000 adult Americans to address the challenging topic of Collaborative Care. Our objective is to illustrate how the presence or absence of Collaborative Care impacts the lives of a large sample of Americans

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regardless of their personal characteristics or burden of illness.

METHODS

More than 20 years ago, the Dartmouth Cooperative Practice-Based Research Network (COOP) identified important, wide gaps in communication between patients and physicians about important physical and emotional problems (Nelson et al., 1983). Hoping to bridge this communication gap, the COOP developed and tested standard measures of patient function (Nelson et al., 1990). But the COOP and other investigators soon discovered that accurate measurement of patient function alone was insufficient to improve communication and healthcare (Rubenstein et al., 1989; Wasson et al., 1992). More highly developed assessment and information feedback systems were necessary to bring both parties together (Ahles et al., 2006; Magari et al., 1998; Wasson et al., 1997, 1999). The COOP is using the Internet to disseminate nationwide such a system, without charge (Luce et al., 2004; Wasson & James, 2001; <http://www.howsyourhealth.org>).

The assessment and feedback system contains:

1. One hundred twelve items in branching logic to assess the users' general function, symptoms, concerns, health habits, chronic condition management, communication with clinicians, and quality of healthcare services (<http://www.howsyourhealth.org>; Wasson et al., 1992).*
2. Information in English or Spanish tailored to the users' responses including specific guidelines and suggestions for the management of chronic conditions.
3. Summary feedback of individual responses for the user and health professionals.
4. A portable patient record using a national standard format, a problem-

solving module that helps individuals change their problem behaviors, and an ongoing anonymous forum for users to share experiences with others.

Community and clinical sponsors may stimulate the use of the Internet survey by word-of-mouth publicity, publicity campaigns, or direct requests. Sponsors of the survey have online options to retrieve aggregate information, offer special condition management programs, and customize survey items. For example, when states or cities sponsor the survey, they may ask respondents to list their usual provider of healthcare, their employer, and their hospital affiliation (Luce et al., 2004; Wasson & James, 2001).

The period covered by this report is April 2003 to April, 2005. From 50,253 civilian respondents to the survey from across the United States, we focus here on the 24,609 respondents who had common chronic diseases or significant causes of dysfunction for which good information from clinicians and confident patient self-management denotes effective Collaborative Care (Bodenheimer et al., 2002a, 2002b; Greenfield et al., 1985; Newman et al., 2004; Wanless, 2002; Warsi et al., 2004).

Collaborative Care

To participate in Collaborative Care, a patient must receive useful information from a clinician.

In the survey, respondents who report hypertension, cardiovascular disease, diabetes, or chronic respiratory disease are asked:

You checked that you have high blood pressure, heart trouble, diabetes, or breathing problems. In general, how would you rate the information given to you about these problem(s) by your doctor or a nurse? Excellent. Very Good. Good. Fair. Poor. I do not remember receiving any information.

If they have dysfunction (pain or emotional problems and limitations in daily activities, social activities, physical activities, or social support), they are asked:

How would you rate the explanation of the problem? Excellent. Very Good. Good. Fair. Poor.

*A list of the items used for the age group 19 to 69 can be accessed from <http://www.howsyourhealth.org>.

Useful clinician information is based on “excellent” or “very good” responses for the members of the study population who have these chronic diseases or dysfunctions.

A single item in the survey captures the concept of “self-care.” *Self-care* is also called self-management or patient activation (Chodosh et al., 2005; Hibbard et al., 2004; Lorig et al., 2001).

How confident are you that you can control and manage most of your health problems? Very confident. Somewhat confident. Not very confident. I do not have any health problems.

Confident self-care is based on a “very confident” response.

These 2 measures of patient-clinician interaction—clinician information and patient self-care—were combined to produce 3 categories of Collaborative Care: good (both useful information and confident self-care), poor (neither), or fair (a combination).

Analysis

We report the influence of good, fair, or poor Collaborative Care on measures of:

- treatment effect on pain and emotional problems;
- disease control (blood pressure and serum cholesterol level in hypertension, cardiovascular conditions, and diabetes; blood glucose level in diabetes);
- disease prevention strategies (completion of mammogram and bowel cancer screening; possible problems attributed to medication; Safron et al., 1998); and
- economic impact (productive time lost from work, days sick at home, and emergency department or hospital use).

Logistic regression was used to compare these measures across levels of Collaborative Care adjusted for the quality of health-care and respondent age groups (19–49, 50–69), gender, financial status, burden of illness, number of prescription medications, and health behavior. (These variables are shown in Table 1.) Adjusted proportions are reported, which were calculated as follows: Adjusted proportions for people with a particular characteristic (eg, the proportion of respondents

reporting disease control out of those that participate in good Collaborative Care) were calculated by taking the mean of predicted values from the logistic regression for all subjects (assuming that all had participated in good Collaborative Care). Confidence intervals for the adjusted proportions were calculated using bootstrap methods.

RESULTS

Respondent characteristics

Civilian adults ($N = 50,253$) across the United States aged 19–69 completed the survey: midwest (36%), south (22%), the mid Atlantic (17%), New England (13%), and west (12%). Of all the respondents, 24,609 (49%) had the target common chronic diseases (hypertension, cardiovascular, diabetes, and respiratory) or bothersome dysfunction. The percentage of men and women reporting these chronic diseases or dysfunction within each gender was equal. Across 85 clinical settings specifically identified by the respondents, the median percentage of patients with these common chronic diseases or bothersome dysfunctions was 50%; the interquartile range was from 38% to 58%. Most (76%) of these clinical settings had more than 10 clinicians.

Two thirds of the respondents with the target conditions were women, and the majority between the ages of 19 and 49. Younger respondents (44%) were less likely to suffer from the target conditions than persons aged 50 to 69 (60%).

Twenty-one percent of all respondents participated in good Collaborative Care, 36% attained fair Collaborative Care, and 43% experienced poor Collaborative Care. Table 1 illustrates the complex interaction among the levels of Collaborative Care and respondent characteristics and their needs. In addition, the table also shows that those who experience good Collaborative Care are much more likely to feel higher levels of provider continuity, very easy access to care, and greater efficiency of care.

To explicate the unique contribution of Collaborative Care on the patient-reported

Table 1. Respondent characteristics, healthcare quality, and Collaborative Care

	% All respondents, 100% (N = 24,609)	Good Collaborative Care, 21% (n = 5308)	Fair Collaborative Care, 36% (n = 8794)	Poor Collaborative Care, 43% (n = 10,507)
Demographics*				
Female	67	56	66	71
Age 19-49 y	60	48	60	69
Low financial status	21	10	17	29
Bothersome dysfunction				
Pain	27	14	24	36
Emotional	23	6	18	33
Social support	22	6	21	37
Physical activity	15	7	13	20
Daily activity	10	3	7	15
Social activity	9	2	7	14
Chronic disease				
Hypertension	42	58	44	33
Respiratory	22	28	20	19
Arthritis	21	20	21	22
Diabetes	12	14	13	11
Cardiovascular	8	10	9	7
Symptoms				
More than one bothersome symptom	50	27	47	66
Composite Burden of Illness Score* (Dysfunction, Disease, Symptoms)	4.3	3.6	4.3	4.7
Unique prescription medications*				
≥3	35	35	33	37
Lifestyle				
Not exercising regularly	67	52	66	76
Body mass index ≥ 30	42	37	43	44
Poor injury prevention or poor eating habits	28	10	25	41
Smoking	18	11	15	23
Told to "cut down" drinking	9	7	9	11
Composite Health Behavior Score*	3.4	2.6	3.1	4.2
Healthcare quality				
Provider continuity	78	90	82	69
Very easy access	39	67	44	21
Doctor's office is well organized, efficient, and does not waste time	60	79	65	44
Composite: Perfect care*	28	55	31	11

*Used to adjust all subsequent analyses. Burden of illness ranges from 0 (none) to 11 and health behavior from 0 (no risk) to 15.

Table 2. Impacts of Collaborative Care*

	Good Collaborative Care	Fair Collaborative Care	Poor Collaborative Care
Treatment impacts			
Past treatment has made pain much better	34.7 (30.3–39.2)	24.5 (22.7–26.3)	9.6 (8.4–10.7)
Past treatment has made emotional problems much better	34.8 (29.6–40.0)	23.3 (19.9–26.6)	12.5 (10.5–14.5)
Persons with hypertension, cardiovascular disease, or diabetes reporting that their systolic blood pressure is <140	74.8 (73–76.6)	69.8 (68.7–70.9)	64.6 (63.1–66.2)
Persons with hypertension, cardiovascular disease, or diabetes reporting that their serum cholesterol level is <200	52.6 (51–54.3)	46.8 (45–48.5)	44.3 (42.6–45.9)
Persons with diabetes reporting that their blood glucose level is always in the range of 80–150	31.2 (27.6–34.5)	19.5 (17.6–21.5)	14.1 (12–16.4)
Disease prevention			
Mammogram in past 2 y	87.8 (86.1–89.4)	87.2 (85.8–88.5)	86.0 (84.9–87.1)
Bowel cancer screening in past 2 y	56.6 (54.1–58.7)	52.2 (50.6–53.8)	50.3 (48.7–52.2)
Persons reporting possible problems from their medications	8.6 (7.3–9.9)	14.0 (13.1–14.9)	20.1 (19.8–21.9)
Economic impacts			
Persons who spent at least 1 d at home because of illness in the past 3 mo	26.9 (25.9–28.0)	29.1 (28.3–29.9)	31.6 (30.8–32.4)
Persons reporting that physical or emotional problems limited their capacity to work at full capacity during the previous 2 wk	18.0 (15.7–20.2)	24.3 (22.3–26.3)	33.4 (31.4–35.4)
Persons with common chronic diseases reporting any hospital or emergency department use in the past year	12.3 (11.2–13.5)	12.2 (11.4–12.9)	14.2 (13.2–15.1)

*Values given in parentheses are 95% confidence intervals after adjustment for age, gender, financial status, burden of illness, overall healthcare quality, and health behaviors.

impacts of such care, subsequent analyses adjust for respondent demographics, burden of illness, number of medications, health behaviors, and the quality of his or her healthcare.

Collaborative Care and treatment impact for common conditions

Table 2 shows that good Collaborative Care is strongly associated with several measures of treatment benefit.

For the most common limitations of pain ($n = 6678$) or emotional problems ($n = 5262$), treatment more often made these limitation “much better” when given by professionals who had engaged the patients in good Collaborative Care. The same pattern is noted for the less-frequent limitations in daily activities, social activities, social support, or physical function (data not shown).

Persons with hypertension ($n = 10,200$), cardiovascular disease ($n = 1971$), and diabetes ($n = 2940$) should have good control of their blood pressure and serum cholesterol level. Table 2 indicates that persons with these chronic diseases who receive good Collaborative Care attain the best blood pressure and serum cholesterol control. Control of blood glucose by diabetic patients is also strongly associated with good Collaborative Care.

Collaborative Care and disease prevention

Bowel cancer screening rates are higher for good Collaborative Care and the likelihood of problems with medications much lower. However, mammography use was high (86%–88%) and showed no significant variation among the 3 categories of Collaborative Care. Good Collaborative Care is associated with a lower chance for perceived medication problems than fair or poor Collaborative Care.

Economic impact and measures of Collaborative Care

In this cross-sectional survey, we observed that good Collaborative Care is associated with less time lost from productive work and somewhat fewer days sick at home ($P < .0001$). Although poor Collaborative Care is associated with higher annual use of the emergency department or hospital for persons with chronic diseases (14.2% vs 12.3% for fair or good Collaborative Care; $P = .0002$), the absolute difference is quite small.

DISCUSSION

Approximately 25,000 Americans aged 19 to 69 with common chronic diseases and significant dysfunction completed a standard, Internet-based health and healthcare assessment. We used the anonymous responses of this population to measure and gauge the impacts of Collaborative Care.

What value does this article add to what is already known about the benefits of Collaborative Care?

First, the findings are based on a very large sample of Americans in which we are able to adjust for a large number of variables. If one accepts the face validity of our measure of Collaborative Care, we can confirm many benefits of Collaborative Care. Good Collaborative Care is associated with better treatment effect, better disease control, greater use of some preventive services, and less loss of time from work.

Second, despite the benefits of good Collaborative Care, our results indicate that only few Americans are receiving it—the interquartile range of good Collaborative Care across practices was only 18% to 31%.

What are the limitations of this study?

Most critical is the fact that the results are based on cross-sectional survey responses. Are we reporting “reverse causation,” whereby people in good health feel that their management of disease is successful, while those who remain infirm view their management a failure? Only a carefully conducted longitudinal study can entirely answer this question. Nonetheless, by controlling for both the burden of illness and the care quality (in addition to respondent demographics and health behaviors), the survey results strongly support the inference that Collaborative Care has a large, independent contribution to outcomes for most patients. Although the results of a cross-sectional survey cannot prove cause, we believe that these results constructively draw attention to the leverage points—information, self-care skill, and supportive system design—through which clinicians can attain the best outcomes of care for both the individual patient and the population (Ahles et al., 2006; Bodenheimer et al., 2002a, 2002b; Chodosh et al., 2005; Greenfield et al., 1985; Newman et al., 2004; Wanless, 2002; Warsi et al., 2004).

Measures based on patient self-report may be of concern despite the fact that patient report for care quality and personal function have proved to be valid and are used widely (Nelson et al., 1983; Safran et al., 1998). Furthermore, we find that patient self-report of biometric measures was strongly associated with actual values recorded in medical

records. For example, among 365 diabetic patients reporting that the self-test results of blood glucose level was in the range of 80 to 150 "all of the time," the average glycosylated hemoglobin was actually 6.8; for "often" responses, it was 7.3 ($n = 528$); and for "sometimes," "rarely," or "seldom," it was 8.4 ($n = 297$).

This study is based on a freely available technological service to improve health and healthcare. A useful byproduct of the technology is its capacity to obtain and respond to many health-related variables from different populations in diverse settings. A disadvantage of any new technology is that some people initially do not use it; in other words, the population represents a convenience sample. Fortunately, because of the large number of users, we were able to examine the impact of different levels of Collaborative Care in population subgroups and adjust the analyses for imbalances in such important variables as respondent age, gender, illness burden, health behavior, and financial status. The results re-

main robust in all subgroups after adjustment and are similar to comparable measures when collected by other means (Blendon et al., 2003; Leatherman & McCarthy, 2005).

This study suggests that a productive interaction involving both the practitioner and the patient is associated with better results than either information transfer by health professionals or patient self-care confidence alone. Case studies from exemplary practices can serve as models for building Collaborative Care into routine clinical healthcare delivery (Nelson et al., 1983; The Institute for Healthcare Improvement, n.d.; The Wall Street Journal, 2005).

The policy implication of this study is straightforward: full participation in good Collaborative Care is a measurable and attainable method to improve outcomes for many health problems and many patients regardless of their burden of illness, financial status, or health behaviors. Good Collaborative Care is very likely to increase quality care and lower its cost.

REFERENCES

- Ahles, T., Wasson, J., Seville, J. L., Johnson, D. J., Cole, B. E., Hanscom, B., et al. (2006). A controlled trial of methods for managing pain with or without co-occurring, psychological problems. *Annals of Family Medicine*, 3, 1-13.
- Blendon, R. J., Schoen, C., DesRoches, C., Osborn, R., & Zapert, K. (2003). Common concerns amid diverse systems: Health care experiences in five countries. *Health Affairs*, 22, 106-121.
- Bodenheimer, T., Lorig, K., Holman, H., & Grumbach, K. (2002a). Patient self-management of chronic disease in primary care. *The Journal of the American Medical Association*, 288, 2469-2475.
- Bodenheimer, T., Wagner, E. H., & Grumbach, K. (2002b). Improving primary care for patients with chronic illness: The chronic care model, Part 2. *The Journal of the American Medical Association*, 288, 1909-1914.
- Braddock, C. H., Edwards, K. A., Hasenberg, N. M., Laidley, T. L., & Levinson, W. (1999). Informed decision making in outpatient practice: Time to get back to basics. *The Journal of the American Medical Association*, 282, 2313-2320.
- Chodosh, J., Morton, S. C., Mojica, W., Maglione, M., Suttorp, M. J., Hilton, L., et al. (2005). Meta analysis: Chronic disease self-management programs for older adults. *Annals of Internal Medicine*, 143, 427-438.
- Gotler, R. S., Flocke, S. A., Goodwin, M. A., Zyzanski, S. J., Murray, T. H., & Stange, K. C. (2000). Facilitating participatory decision-making: What happens in real world community practice? *Medical Care*, 38, 1200-1209.
- Greenfield, S., Kaplan, S., & Ware, J. (1985). Expanding patient involvement in care: Effect on patient outcomes. *Annals of Internal Medicine*, 102, 520-528.
- Hibbard, J. H., Stockard, J., Mahoney, E. R., & Tusler, M. (2004). Development of the Patient Activation Measure (PAM): Conceptualizing and measuring activation in patients and consumers. *Health Services Research*, 39, 1005-1026.
- King, T., & Wheeler, B. (2004). Inequality in health care: Unjust, inhumane and unattended! *Annals of Internal Medicine*, 141(10), 815-816.
- Kravitz, R. L., Bell, R. A., Azari, R., Kelly-Reifs, K. E., & Thom, D. H. (2003). Direct observation of requests for clinical services in office practice: What do patients want and do they get? *Archives of Internal Medicine*, 163, 1673-1681.
- Kravitz, R. L., Bell, R. A., Franz, C. E., Elliott, M. N., Amsterdam, E., Willis, C., et al. (2002). Characterizing

- patient requests and physician responses in office practice. *Health Service Research*, 37, 217-238.
- Leatherman, S., & McCarthy, D. (2005). *Quality of health care for Medicare beneficiaries: A chartbook*. Retrieved from the Commonwealth Fund Web site: <http://www.CMWF.org>
- Lorig, K. R., Sobel, D. S., Ritter, P. L., Laurent, D., & Hobbs, M. (2001). Effect of a self-management program on patient with diabetes. *Effective Clinical Practice*, 4, 256-261.
- Luce, P., Phillips, J., Benjamin, R., & Wasson, J. H. (2004). Technology to support community health alliances. *Journal of Ambulatory Care Management*, 27, 399-407.
- Magari, E. S., Hamel, M. B., & Wasson, J. H. (1998). An easy way to measure quality of physician-patient interactions. *Journal of Ambulatory Care Management*, 21(3), 27-33.
- McGlynn, E. A., Asch, S. M., Adams, J., Keesey, J., Hicks, J., DeCristofaro, A., et al. (2003). The quality of health care delivered to adults in the United States. *The New England Journal of Medicine*, 348, 2635-2645.
- Nelson, E. C., Conger, B., Douglass, R., Gephart, D., Kirk, J., Page, R., et al. (1983). Functional health status levels of primary care patients. *The Journal of the American Medical Association*, 249(24), 3331-3338.
- Nelson, E. C., Landgraf, J. M., Hays, R. D., Wasson, J. H., & Kirk, J. W. (1990). The functional status of patients: How can it be measured in physicians' offices? *Medical Care*, 28(12), 1111-1126.
- Newman, S., Steed, L., & Mulligan, K. (2004). Self-management interventions for chronic illness. *The Lancet*, 364, 1523-1537.
- One cure for high health care costs: In house clinics. (2005, February 11). *The Wall Street Journal*, p. A1.
- Relman, A. S. (2005, March 7). The health of nations: Medicine and the free market. *The New Republic*, pp. 23-30.
- Rogers, A., Kennedy, A., Nelson, E., & Robinson, A. (2005). Uncovering the limits of patient-centeredness: Implementing a self-management trial for chronic illness. *Quality Health Research*, 15(2), 224-239.
- Rubenstein, L. V., Calkins, D. R., Young, R. T., Cleary, P. D., Fink, A., Koscoff, J., et al. (1989). Improving patient function: A randomized trial of functional disability screening. *Annals of Internal Medicine*, 111, 836-842.
- Safron, D. G., Kosinski, M., Tarlov, A., Rogers, W. H., Taira, D. H., Lieberman, N., et al. (1998). The Primary Care Assessment Survey: Tests of data quality and measurement performance. *Medical Care*, 38, 728-739.
- Scott, J. G., Cohen, D., DiCicco-Bloom, B., Orzano, A. J., Jaen, C. R., et al. (2001). Antibiotic use in acute respiratory infections and the ways patients pressure physicians for a prescription. *Journal of Family Practice*, 50, 853-858.
- The Institute for Healthcare Improvement. (n.d.). *How's your health? Survey tool bringing patients and physicians onto the same page*. Retrieved from <http://www.ihl.org/IHI/Topics/Improvement/ImprovementMethods/ImprovementStories/HowYourHealthSurveyToolBringingPatientsandPhysiciansontotheSamePage.htm>
- Wanless, D. (2002). *Securing our future health: Taking a long-term view*. A report to the Office of the Exchequer. Retrieved from <http://www.hm-treasury.gov.uk/wanless>
- Warsi, A., Wang, P. S., Lavalley, M. P., Avorn, J., & Solomon, D. (2004). Self-management education programs in chronic disease. *Archives of Internal Medicine*, 164, 1641-1649.
- Wasson, J., Hays, R., Rubenstein, L., Nelson, E., Leaning, J., Johnson, D., et al. (1992). The short-term effect of patient health status assessment in a health maintenance organization. *Quality of Life Research*, 1(2), 99-106.
- Wasson, J. H., & James, C. (2001). Implementation of a web-based interaction technology to improve the quality of a city's health care. *Journal of Ambulatory Care Management*, 24, 1-12.
- Wasson, J. H., Jette, A. J., Johnson, D. J., Mohr, J. J., & Nelson, E. C. (1997). A replicable and customizable approach to improve ambulatory care and research. *Journal of Ambulatory Care Management*, 20(1), 17-27.
- Wasson, J. H., Keller, A., Rubenstein, L. V., Hays, R. D., Nelson, E. C., Johnson, D., & the Dartmouth Primary Care COOP. (1992). Benefits and obstacles of health status assessment in ambulatory settings: The clinician's point of view. *Medical Care*, 30(5 Suppl.), MS42-MS49.
- Wasson, J. H., Stukel, T. A., Weiss, J. E., Hays, R. D., Jette, A. M., & Nelson, E. C. (1999). A randomized trial of using patient self-assessment data to improve community practices. *Effective Clinical Practice*, 2, 1-10.

Resource Planning for Patient-centered, Collaborative Care

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Abstract: In this article, we use self-reported information from 13,271 older adults and the results from several controlled trials to construct a planned-care management strategy that cuts across diseases and conditions and also addresses health disparities attributed to low socioeconomic status. Three strata result from the interaction of patients' financial status, the presence or absence of bothersome pain and psychosocial problems, and their confidence with self-care. A majority of ambulatory patients generally fall in the first stratum. More resources are required in the 2 remaining strata to attain patient-centered, collaborative care. Because the planned-care management strategy is behaviorally sophisticated, it is likely to be more efficient and effective than strategies based on concepts of disease management that focus on either a single disease or groupings of patients who are "high utilizers" of healthcare. We conclude that modern technologies and related approaches make resource planning for patient-centered, collaborative care feasible and desirable. **Key words:** *collaborative care, disease management, health assessment, patient-centered, quality of care, self-management*

RESOURCE PLANNING builds from the body of knowledge in industry known as production planning or repetitive master scheduling. Resource planning is based on the fact that health systems tend to do certain types of work regularly and predictably. Frontline health workers are frequently in a reactive rather than a planned mode of operation based on knowledge of the patient needs. Resource planning stresses that it is

much better for the patient to receive care that is planned: "if it is scheduled, it will happen; if it is not planned, it is difficult to make it happen."

Disease management uses some principles of resource planning to deliver care to patients with a condition. For example, under a disease management protocol, patients with diabetes might "automatically" have their feet checked at each visit, receive some education materials about diabetes, have a phone call from a nurse who will talk about diabetes management, and receive a follow-up call to reinforce self-management.

However, despite being useful as an example of basic resource planning, disease management has a number of limitations. First, from both patient and healthcare professional perspectives, disease management does not easily accommodate the fact that patients with one disease have also other diseases or bothersome conditions (Boyd et al., 2005). A generic care management strategy is

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needed that would effectively and efficiently address several important issues at a time. Second, disease management focuses on disease and “what is the matter?” Because disease management is concerned about the clinical measures and issues, it can be behaviorally insensitive to “what matters” to a patient population (Moore and Wasson, 2006; Wasson et al., 2006). Resource planning for patient-centered, collaborative care will require knowledge of both “what is the matter?” and “what matters.” Finally, disease management tends to be inefficiently “added on” rather than being “built in” to practice.

In this article, we use patient-reported information and the results from several controlled trials to construct a planned-care management strategy that cuts across diseases and conditions and also addresses health disparities attributed to low socioeconomic status (Braveman et al., 2005). We illustrate how behaviorally sophisticated care management can be planned and implemented more efficiently and effectively than a typical disease- or utilization-based strategy.

Data were derived from 13,271 respondents to www.howsyourhealth.org who were aged 50 years or older and who had at least one chronic disease or bothersome condition. Sixty-one of these respondents were women, 87% were aged between 50 and 69, 10% were between 70 and 79, and 3% were aged 80 and older. Sixteen percent of these patients had cardiovascular disease and 18% had diabetes

TWO COMMON DISEASES

More than 80% of the patients with a cardiovascular disease had other diagnoses or bothersome conditions. The most common were hypertension (64%), moderate or greater pain (59%), diabetes (28%), respiratory disease (20%), and bothersome emotional problems (16%). The burden of comorbidity was most influenced by patient financial status. For example, among poor financial status patients, 58% had 3 or more of these diagnoses or conditions, 49% took more than 5 medications,

and 52% had both pain and bothersome emotional or social limitations. For comparison, the corresponding percentages among good financial status patients were 22%, 36%, and 16%, respectively.

Patients who participate in good collaborative care are likely to experience better outcomes (Wasson et al., 2006). By definition, these patients will be confident that they can manage and control most of their health problems. Table 1 confirms that cardiac patients' self-care confidence is associated with less use of the emergency department or hospital in the previous year. We have added additional subcategories on the basis of patient needs. When present, the categories of “pain and psychosocial problems” and poor financial status greatly reduce patient confidence with self-care and increase emergency department or hospital use.

Among patients with diabetes, many disease and conditions are also represented: 68% have hypertension, 58% have moderate or greater pain, 26% have cardiovascular disease, 20% respiratory disease, and 15% have bothersome emotional problems. Table 2 illustrates the same patterns for persons with diabetes we observed for healthcare utilization among cardiac patients, namely, the important impacts on self-reported blood glucose control by self-care confidence, the presence of pain and psychosocial problems, and financial status. Higher confidence is better than lower confidence. Poor financial status or pain and psychosocial problems are deleterious to disease control. We again notice that those patients having poor financial status with pain and psychosocial problems are the least likely to feel confident.

Regardless of disease or condition, we observe that patients with pain and psychosocial problems or low financial status have a low level of confidence because of deficiencies in communication and information transfer between patients and healthcare providers. We illustrate this general point in Table 3. The clinicians and the patients are most often not “on the same page” when patients have pain and psychosocial problems and low financial status.

Table 1. Percentage of cardiac patients using the emergency department or hospital at any time in the previous year*

	Confident	Somewhat confident	Not confident
% Any utilization among all patients with cardiac diagnoses	27 (N = 707)	31 (N = 916)	57 (N = 241)
% Any utilization for patients with different indicators of need			
Good financial status without pain and psychosocial problems	26 (n = 607)	27 (n = 644)	41 (n = 73)
Poor financial status without pain and psychosocial problems	36 (n = 39)	31 (n = 94)	66 (n = 25)
Good financial status with pain and psychosocial problems	24 (n = 46)	38 (n = 117)	41 (n = 56)
Poor financial status with pain and psychosocial problems	40 (n = 15)	50 (n = 61)	83 (n = 87)

*Pain and Psychosocial indicate moderate or greater pain *and* often or always bothered by emotional problems or limited social support.

THE CONSTRUCTION OF BEHAVIORALLY SOPHISTICATED CARE MANAGEMENT STRATEGY

A low-intensity, self-care strategy might consist of standard assessment, feedback to the

physician, and tailored information for the patient ("infofeed"). "Infofeed" should address both clinician lack of awareness of problems that matter to patients and provide standardized high-quality information. A controlled trial has demonstrated some benefits

Table 2. Percentage of blood glucose level often or always in the range of 80-150 in diabetic patients*

	Confident	Somewhat confident	Not confident
% Blood glucose level often or always in the range of 80-150 among all patients with diabetes	76 (N = 775)	62 (N = 1057)	27 (N = 300)
% Blood glucose level of 80-150 for patients with different indicators of need			
Good financial status without pain and psychosocial problems	78 (n = 640)	77 (n = 688)	32 (n = 93)
Poor financial status without pain and psychosocial problems	73 (n = 66)	60 (n = 131)	27 (n = 49)
Good financial status with pain and psychosocial problems	78 (n = 41)	57 (n = 154)	29 (n = 75)
Poor financial status with pain and psychosocial problems	61 (n = 28)	45 (n = 84)	21 (n = 83)

*Pain and Psychosocial indicate moderate or greater pain *and* often or always bothered by emotional problems or limited social support.

Table 3. Experiences of cardiac patients

	Without pain and psychosocial problems (N = 1482)	Pain and psychosocial problems with good financial status (N = 219)	Pain and psychosocial problems with poor financial status (N = 163)
% Receiving very good information about chronic conditions	68	51	23
% Reporting doctor or nurse aware of significant emotional problems <i>and</i> very good information received about the problems	27	27	13
% Reporting doctor or nurse aware of very bothersome pain <i>and</i> very good information received about the pain	43	34	15

when patients use “infofeed” and their doctors respond to it (Wasson et al., 1999). We call this strategy A.

We recently completed a controlled trial of generic “problem solving” and educational feedback tailored for patients aged 50 to 69 who had pain and psychosocial problems (Ahles et al., 2006). These patients also had many common diseases. They received the low-intensity strategy A: they completed the HowsYourHealth Survey from which information for them and their doctors was generated. In addition to this “infofeed,” they received an average of 3 telephone calls from a nurse they had never met. The nurse coached them in problem solving. One year later, the results showed positive impacts in most measures of patient function for persons with a good financial status but there was little impact for those with a poor financial status. We shall call this intervention above the “infofeed” of strategy A, strategy B.

Taken together, these controlled trials suggest that while the “infofeed” of strategy A is necessary to “get on the same page,” it is not sufficient for patients who have pain and psychosocial problems. The human interaction and coaching added to “infofeed,” albeit on average limited to only a few phone

calls, accounted for most of the effect. But the “infofeed” plus phone approach alone was not sufficient to overcome the greater deficiencies of patients with low financial status. These patients would probably require another strategy building on strategies A and B. We call this strategy C.

How might these strategies (A, B, and C) be applied across all patients and all diseases or conditions? On the basis of the insights provided from the controlled trials and the data shown in Tables 1 and 2, it is very likely that the patients clustered around the upper left corner are already doing quite well with self-care. For example, among the persons with diabetes eligible for an “infofeed” strategy A, blood glucose level is in good control most of the time. All of these patients are already confident or somewhat confident of their ability to manage or control their health problems (see Table 2).

Conversely, relatively few patients who are not confident or who are of poor financial status with pain and psychosocial problems will have good control of their blood glucose level. They will need an intensive “strategy C” intervention.

The patients eligible for neither strategy A nor strategy C are patients very similar to

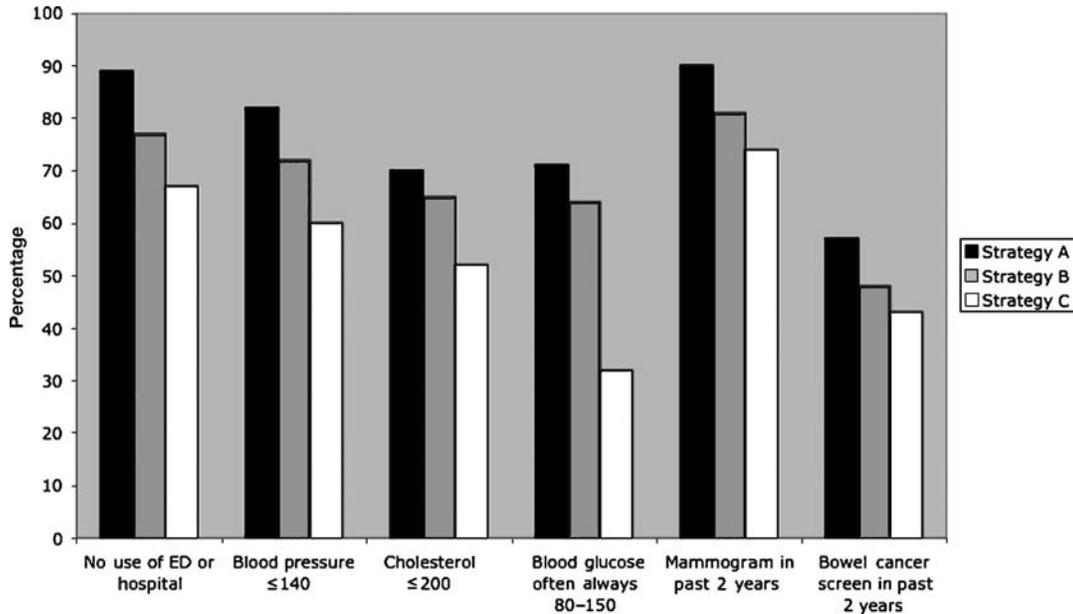


Figure 1. Healthcare processes and outcomes sorted by patient eligibility for planned-care strategies. ED indicates emergency department.

those who benefited in the controlled trial of strategy B—“infofeed” and phone-based, problem solving with reinforcement.

Figure 1 illustrates the association of these 3 strategies with clinical quality measures across all 13,271 patients aged 50 and older who have at least one chronic condition. The figure demonstrates a decline in all quality measures across strategies A, B, and C.

The decrement in quality shown in Figure 1 reflects both patient and practice characteristics. For example, across strategies A, B, and C, provider continuity declines from 91% to 84% and 77%; the reports of “perfect care” are 38%, 23%, and 10%, respectively.

Collaborative care requires both practice and patient change. When the practice processes are kept constant, as was the case in the controlled trial that supports the behavioral emphasis of strategy B, we observed benefits. We would expect even greater benefits if clinical practices improve their general processes and institute more behaviorally sophisticated planned-care management strategies.

RESOURCE PLANNING A MANAGEMENT STRATEGY FOR PATIENT-CENTERED, COLLABORATIVE CARE

Resource planning requires that the health-care providers match what is known to be effective with the high-leverage “commonalities” among 80% of these patients. Once the needs of the patients are clear, the practice staff usually has to change roles and the care processes so that the patients in each stratum receive the care that is planned for them. Common barriers to resource planning are shown in Box 1.

We have described 3 strategies a practice or health system might use for planned-care management of patients with chronic conditions. While we have described 3 strategies, a practice might decide to simplify by combining strategy B with strategy C. The best way to estimate the work is to ask a random sample of 20 to 30 patients to respond to a survey about their conditions, financial status, confidence with self-care, bothersome pain,

Box 1.**Common Barriers to Effective Resource Planning**

- It is neither necessary nor possible to provide all things to all patients. But it is possible to plan the delivery of the most effective management strategies to the most appropriate group of patients.
- *A disease-specific focus.* A disease-specific focus is usually either very expensive or counterproductive because (i) patients usually have more than one disease and each “disease cycle” requires resources and (ii) the “disease” chosen by the “educator” may not be the problem that matters to the patient.
- A failure to take advantage of high-leverage “commonalities” across most patients and conditions. Strategies A, B, and C stress the commonalities.
- Relevant to the theme of this series is the failure of practices to adopt technology or proven approaches (techne) that are more efficient and effective than the usual care. For example, patients can use the publicly available www.howsyourhealth.org to receive information tailored to their needs, send the information to their doctor, and enter the information into a registry for the office without requiring office staff data entry. A generic problem-solving approach derived from the results of a controlled trial is also available at the Web site (Ahles et al., 2006).
- A failure to recognize that the most highly trained professionals (physicians and registered nurses) are often the least cost-effective providers of the strategies for 80% of the patients. Higher training is usually needed most to individualize care for the 20% of patients who “do not fit” the preplanned strategies.
- A failure of leadership to push for implementation of a more generic, planned, step care management strategy as a way to reduce waste resulting from current ineffective or redundant approaches. The staff must continuously remove waste and rework as they resource plan services to meet their patients’ needs (Wasson et al., 2003; Wenger et al., 2003).
- *Failure to start small but plan large.* Resource planning needs to be introduced carefully to patients and the staff because it usually requires them to adapt to changes in roles and processes. Yet, careful introduction should not be an excuse to advance so slowly that the efficiency of planning for 80% of the care is not realized. Progress should be planned. For example, using a patient registry or a checklist at the time of vital signs, a practice might start with patients aged 50–69 having 3 or more conditions. After the practice has used planned-care management strategies for these patients over a 3–6-month period, it should plan expansion to patients of different ages or patients with one or more conditions.

and emotional problems. A tally of the responses enables the practice to plan resources for patients who will be eligible for the strategies.

AN EXAMPLE: THE IMPLEMENTATION OF A PLANNED-CARE MANAGEMENT STRATEGY IN A HEALTH SYSTEM THAT SERVES PREDOMINANTLY PATIENTS OF POOR FINANCIAL STATUS

Care South Carolina, a rural health system, serves 37,000 patients, many of whom are of poor financial status. It has adopted a mix of technology (such as disease registries) and good techne (such as standardized patient

support with problem solving) to build its planned-care management strategy.

Care South Carolina recently studied diabetic and hypertensive patients whose blood glucose and blood pressure control had languished at less than optimum levels. Care South Carolina discovered that all of these patients had pain. This finding was a complete surprise and stimulated the organization to investigate whether stratification-based financial status, psychosocial problems, and confidence with self-management would work for its patients. A pilot test on 20 patients confirmed the predictions described previously. Care South Carolina learned that about 25% of adult patients are eligible for strategy C.

The organization is now automatically offering many strategy C patients an option to participate in problem solving with a coach. It is also offering the strategy C patients helpful information that it has developed for patients with low-health literacy. About 50% of its patients will be in strategy A.

CONCLUSION

A link of specific interventions to different patient strata is an old concept. For emergency situations, it is called triage. For the treatment of blood pressure, it has been called "stepped care." And for the evaluation of the vulnerable elderly patients, it is considered a method to improve quality (Wenger et al., 2003). It is neither necessary nor possible to provide all things to all patients. But it is possible to plan the delivery of the most effective management strategies to the most appropriate group of patients. On the basis of the characteristics of a large sample of ambulatory patients aged 50 years or older and the results of controlled trials, we propose a planned-care management strategy based on several strata.

Our "infofeed" strategy A is the principle strategy for a large group of patients who are relatively much better at self-care than others. In most settings, a majority of patients will be eligible for strategy A. If a full "infofeed" strategy is not possible, a few items can screen patients and place them in strata useful for resource planning (the so-called CARE Vital Signs approach) (Godfrey et al., 2003; Wasson et al., 2003). As long as patients reliably receive information tailored to their needs and their clinician takes the feedback seriously, the patients should benefit (Wasson et al., 1999).

A smaller percentage of patients would need the addition of problem solving and brief telephone reinforcement by a member of the clinical team or an agent of the clinical team

(strategy B). Strategy B would be modeled on phone-based, problem solving (Ahles et al., 2006). All patients in strategies A and B might benefit from a dedicated 24/7 telephone line with someone who understands their needs.

Strategy C would need to be better tailored to the significant deficiencies of patients who have either low confidence for self-care or who have poor financial status with the additional burden of pain and psychosocial problems. This strategy may be a more intensive version of strategy B coupled with great attention to literacy and remediable social needs. Group visits may also be helpful. Research is still needed to define the most effective strategy C.

The patient-reported information in this report is cross-sectional and limited in its ability to predict the future results of a planned-care management strategy. However, controlled trials that have tested the underlying behavioral strategies do suggest that future tests would demonstrate benefits.

We contend that a prospective planned-care management strategy is likely to be more efficient and effective than strategies based on concepts of disease management that focus on either a single disease or groupings of patients who are "high utilizers" of healthcare. Disease and utilization management strategies do not sort patients into behaviorally meaningful categories at the outset. After the patient is identified, the person delivering the special care must try to fit the patient to the program, or vice versa. In contrast, prospective resource planning of a behaviorally sophisticated strategy can use less highly trained persons to deliver most of the services. Such a strategy should always be more efficient and effective than rework after the fact.

We conclude that modern technologies and related approaches make resource planning for patient-centered, collaborative care feasible and desirable.

REFERENCES

- Ahles, T., Wasson, J., Seville, J. L., Johnson, D. J., Cole, B. E., Hanscom, B., et al. (2006). A controlled trial of methods for managing pain with or without co-occurring psychological problems. *Annals of Family Medicine*, 3, 1-13.
- Boyd, C. M., Dares, J., Boulton, C., Fried, L. P., Boulton, L., &

- Wu, A. W. (2005). Clinical practice guidelines and quality of care for older patients with comorbid conditions. *The Journal of the American Medical Association, 294*, 716-724.
- Braveman, P. A., Cubbin, C., Egerter, S., Chideya, S., Marchi, K. S., Metzler, M., et al. (2005). Socioeconomic status in health research. *The Journal of the American Medical Association, 294*, 2879-2888.
- Godfrey, M. M., Nelson, E. C., Wasson, J. H., Mohr, J. J., & Batalden, P. B. (2003). Microsystems in health care: Part 3. Planning patient-centered services. *Joint Commission Journal on Quality and Safety, 29*, 159-170.
- Moore, L. G., & Wasson, J. H. (2006). An introduction to technology for patient-centered, collaborative care. *Journal of Ambulatory Care Management, 29*(3), 195-198.
- Wasson, J. H., Godfrey, M. M., Nelson, E. C., Mohr, J. J., & Batalden, P. B. (2003). Microsystems in health care: Part 4. Planning patient-centered care. *Joint Commission Journal on Quality Safety, 29*, 227-237.
- Wasson, J. H., Johnson, D. J., Benjamin, R., Phillips, J., & MacKenzie, T. A. (2006). Patients report positive impacts of collaborative care. *Journal of Ambulatory Care Management, 29*(3), 199-206.
- Wasson, J. H., Stukel, T. A., Weiss, J. E., Hays, R. D., Jette, A. M., & Nelson, E. C. (1999). A randomized trial of the use of patient self-assessment data to improve community practices. *Effective Clinical Practice, 2*, 1-10.
- Wenger, N. S., Solomon, D. H., Roth, C. P., MacLean, C. H., Saliba, D., Kamberg, C. J., et al. (2003). The quality of medical care provided to vulnerable community-dwelling older patients. *Annals of Internal Medicine, 139*, 740-747.

The Emergence of Ideal Micro Practices for Patient-centered, Collaborative Care

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Deborah J. Johnson, BA; Judith Zettek, BSN**

Abstract: Ideal Micro Practices are capable of delivering patient-centered collaborative care. With respect to comparable adult patients in “usual” care settings, twice as many patients who use Ideal Micro Practices report they receive care that is “exactly what they want and need exactly when and how they want and need it” (68% vs 35%). Compared to usual care, these very small, low-overhead practices are more likely to have patients report very high levels of continuity (98% vs 88%), efficiency (95% vs 73%), and access (72% vs 53%). Patient ratings of very good information (83% vs 67%) and clinician awareness of pain or emotional problem are also higher (87% vs 69%). However, only a slim majority of patients using Ideal Micro Practices report that they are confident in their ability to manage and control their health problems or concerns. Ideal Micro Practices are sharing new tools and approaches to better understand their patients’ needs and increase patients’ confidence in their ability to manage conditions. In addition, these practices are working collaboratively to standardize their approaches and make the essential elements of Ideal Micro Practice replicable. **Key words:** *practice improvement, quality of care*

WHILE most clinicians deeply value interaction with their patients, the satisfaction of working in a primary care office practice is declining. Points of dissatisfaction include the administrative burden of working with insurers, greater work hours coupled with declining income, and increased overheads. Financial difficulties put increasing pressure on productivity, setting up the vicious cycle of seeing more patients in office visits per day, leading to declining satisfaction (Sox, 2003).

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A complete list of the Phase 1 participating Ideal Micro Practices appears at the end of this article.

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In spite of these stresses in office practice, professionalism drives most clinicians to care deeply about the quality of the care they deliver and many do engage in quality improvement. But only one third of the respondents to a national survey of physicians reported participation in quality improvement. In the report, the smaller the practice size, the lower the likelihood of reporting engagement in quality improvement.

Part of the problem has its roots in the lack of data. Fewer than 25% of practices with 2 to 9 physicians and less than 15% of solo physicians have access to any of their own practice data regarding clinical outcomes, process of care, or patient satisfaction. Without data, it is difficult to craft a coherent improvement plan (Audet et al., 2005).

What is the goal of a primary care practice? Ideally, it should help people achieve their best possible health through appropriate prevention and screening and help them manage their chronic conditions. As noted above, many clinicians find themselves on the hamster wheel of productivity, lacking the tools and the time needed to do more. On

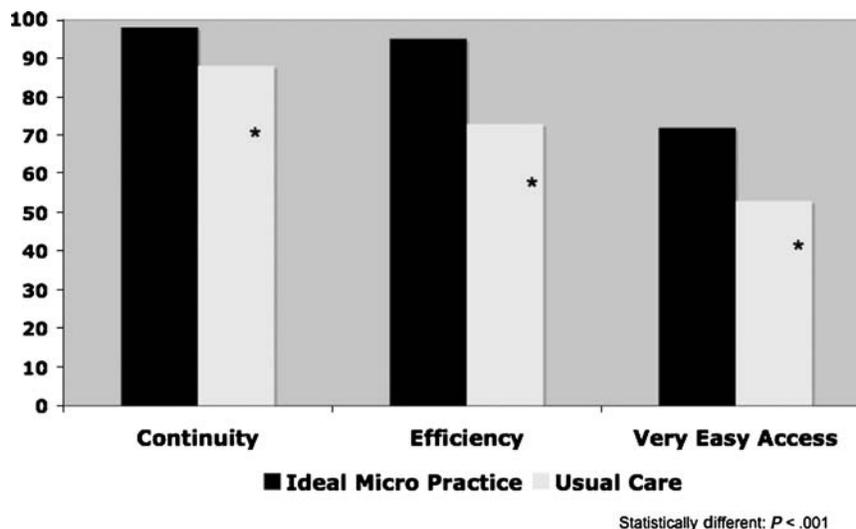


Figure 1. Patient reports on the structural aspects of Ideal Micro Practice and usual care.

the basis of the typical office model of today, 1 study calculated the hours of physician time required for evidence-based chronic disease management on top of typical follow-up and acute care. The none-too-surprising 22.2 hours per day of work is an insurmountable threshold (Ostbye et al., 2005).

If we aim to achieve the improved outcomes we all so desperately want and need, we need an entirely new model of care. One model is emerging, using ideas tested in the Institute for Healthcare Improvement's Idealized Design of the Clinical Office Practices project. The Ideal Micro Practices model strips a primary care office to its essential components so that it is capable of delivering patient-centered, collaborative care.*

THE ESSENTIAL ELEMENTS OF IDEAL MICRO PRACTICES

Structural essentials of Ideal Micro Practices are shown in Figure 1, which also provides comparative data from "usual"

care settings from across the United States. (The patient-reported data is from www.HowsYourHealth.org. To ensure comparability between patients served by Ideal Micro Practices and the National Data, we focus on respondents aged 50–69 who have pain or emotional problems or a chronic disease, and who report that they always have "enough money to buy the essentials—such as food clothing, housing.")

Continuity. In controlled trials, provider continuity greatly increases patient ratings of care quality and greatly reduces the risk for use of the emergency department or hospital. Costs of care are reduced between 25% and 30% (Wasson et al., 1984). Over 95% of the adult patients from Ideal Micro Practices report that "they have one person they think of as their doctor or nurse."

Efficiency. An efficient practice does not waste patient, practice, or society resources. Ninety-five percent of the patients from Ideal Micro Practices affirm that "the doctor's office is well organized, efficient, and does not waste time." Ideal Micro Practices are currently evaluating their impact on societal resources such as money and workforce.

Access. Ideal Micro Practices are built around the concept of 24/7/365 access by phone, e-mail, or face-to-face office visit. Over 70% of patients using Ideal Micro Practices

*How's Your Health? Survey Tool Bringing Patients and Physicians onto the Same Page. <http://www.ihl.org/IHI/Topics/Improvement/ImprovementMethods/ImprovementStories/HowYourHealthSurveyToolBringingPatientsandPhysiciansontotheSamePage.htm>.

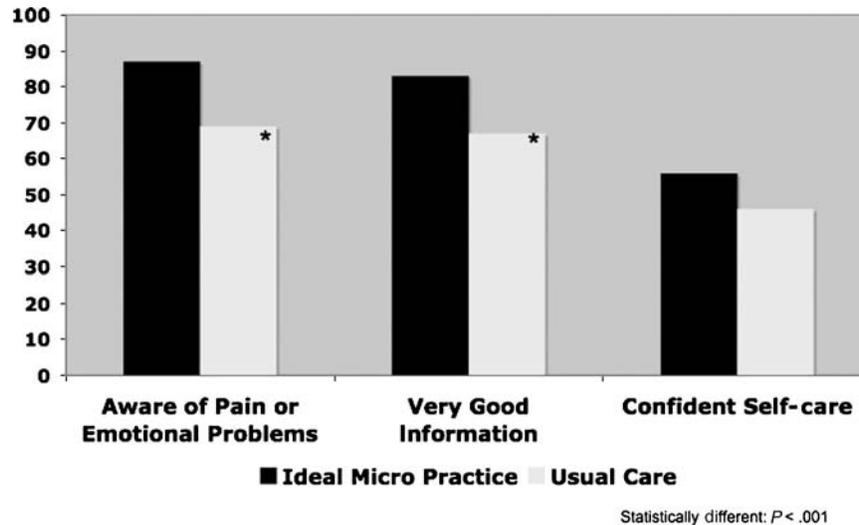


Figure 2. Patient reports on the collaborative aspects of Ideal Micro Practice and usual care.

report that it is “very easy to get medical care when they need it.”

Essential elements for collaborative care within Ideal Micro Practice are illustrated and compared to usual care in Figure 2 (Wasson & Benjamin, 2006; Wasson et al., 2006a).

Awareness of Issues “That Matter” to a Patient. For example, more than 85% of patients report that the doctor is aware of their significant pain or emotional problems.

Very Good Information. About 80% of patients using Ideal Micro Practices claim that the information they have received from the practice about their chronic conditions is very good.

Confidence With Self-management. Currently, a slim majority (56%) of patients report that they are “confident to manage and control their health problems or concerns.” Ideal Micro Practices are sharing tools and approaches to improve this critical element of collaborative care.

THE ADVANTAGES OF IDEAL MICRO PRACTICES

Ideal Micro Practices are able to provide patient-centered, collaborative care because of their structure, the tools they use, and the way they work.

The low overhead allows more time with patients. This low-overhead model started in 2001 in a 1-room practice, and grew within 3 years to include a care manager and 2 rooms. This model does not require working all alone or even as a solitary physician with some staff. Practices can be aggregated. For instance, several units working alongside each other can use other teams for backup when the team clinician is on vacation, to share certain resources like a nebulizer, electrocardiograph machine, billing service, etc (Moore, 2002a, 2002b).

Workflow is straightforward and efficient when continuity is the rule and patients confront no barriers to access. There is an extremely high “show” rate owing to advance access scheduling. Today’s work can be done today because most work is preplanned and there is a low volume of patient visits per day. This low-flow approach is possible because of the lower overhead.

The practices use a structured assessment tool (www.HowsYourHealth.org). The patients obtain information from it tailored to their problems and concerns. They can use other components of it for problem solving. The summary of the assessment flows to the practice for evaluation and follow-up. The patient information also flows directly to a registry so that the practice does not have to

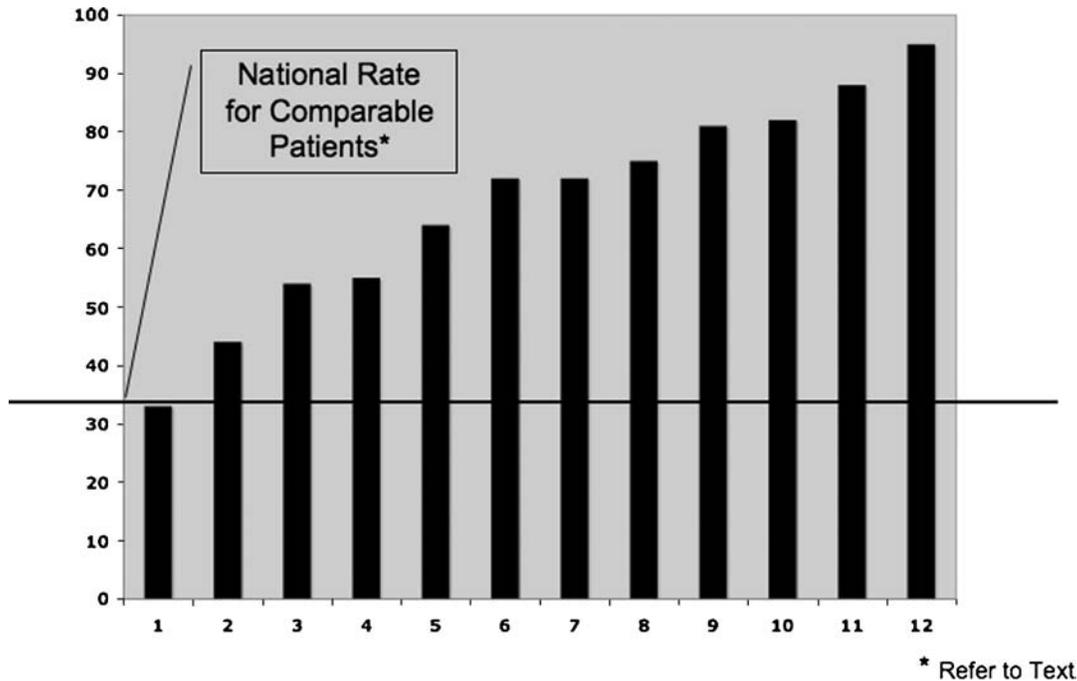


Figure 3. Percentage of patients from 12 Ideal Micro Practices who strongly agree with the statement, "I receive exactly the care I want and need exactly when and how I want and need it."

waste valuable time and resources building a database.

Knowledge of what matters to patients allows the practice to plan the work for the same, as opposed to wasting effort on exhorting patients to follow protocols or guidelines that have little meaning in the context of their lives and conditions.

Regular review of data allows these practices to reflect on processes and tools for continual improvement. Collaboration between similar practices prevents isolation and facilitates shared learning.

STRATEGIES TO IMPROVE IDEAL MICRO PRACTICE

Some of the strategies to improve Ideal Micro Practice include the following:

- Examination of Ideal Micro Practice structure and processes from the clinical and business perspective. Practice overhead as a percentage of revenue currently ranges from 15% to 50%. The clinicians are sharing helpful methods to mini-

mize waste and reduce overhead. (see <http://www.IdealMicroPractice.org>)

- Examination of Ideal Micro Practice from a patient perspective. Ideal Micro Practices demonstrate variation in care quality (Fig 3). They are working on ways to serve patients' wants and needs regularly and predictably. For example, while the baseline information from Ideal Micro Practices is encouraging, it also suggests that these practices need to provide better collaborative care for different levels of patient need.
- Planning Care. One important method to regularly and predictably build good care is to plan it and standardize it (Wasson et al., 2006b). Once the resources are planned, the work of the practice is to identify patient categories and deliver the best, patient-centered, collaborative care within each category. The following describes the current strategies Ideal Micro Practices are using to better deliver patient-centered, collaborative care (Table 1).

Table 1. Ideal micro practices plan care based on the needs of the patient

Patients with	Planned work
Relatively few needs	<ul style="list-style-type: none"> • Screen for status • Very good information • Unfettered access • Reminder system
Moderate needs	Add to above: <ul style="list-style-type: none"> • Group visits • Online community
High needs	Add to above: <ul style="list-style-type: none"> • Collaborative goal setting • Telephone-coach problem solving • Face-to-face problem solving
Possible need for referral to specialty service or consultation	<ul style="list-style-type: none"> • Shared decision-making protocols • Consultation contracts to ensure continuity of care and immediate access to needed information

STRATEGIES TO PLAN CARE WITHIN MICROSYSTEMS

Planned care for patients with relatively few needs

This group of patients needs few resources as they are generally doing well. They need unfettered access to good information and care. Very good information is made available through the screening and self-management support components of HowsYourHealth as well as links to "Problem Solving" and other reliable Web resources. The practice receives a standard feedback assessment from Hows YourHealth and can identify unmet needs.

Ideal Micro Practices recognize that care is based on continuous healing relationships, not office visits. This translates to eliminating any threshold for office appointments, guaranteeing continuity, and on-time office visits. Since excellent care is based on continuous healing relationships, continuity extends 24/7. The physician is accessible via e-mail, phone, or pager. Advance access scheduling and 24/7 continuity actually *reduces* the burden of work for the physician.

Planned care for patients with moderate needs

These patients have pretty good confidence in their ability to manage and have pretty good

information, but do not always follow through on their management plans. Ideal Micro Practices provide them all the tools and support described for patients with few needs and also e-mail reminders to encourage follow-through. If an individual continues a pattern of not following through and/or has greater needs, they move up to the last, or high-need, category.

Planned care for patients with high needs

These individuals identify themselves as having psychosocial problems, pain, and/or poor financial resources, and are also likely to lack good collaborative care (Wasson et al., 2006b).

Ideal Micro Practices devote extra resources to this group, including group visits and telephone-coached problem solving. This is not the same thing as disease management. Telephone-coached problem solving focuses on generic problem solving, not on the disease: "What matters" as opposed to "What's the matter?" (Moore & Wasson, 2006)

Planned care for referrals and consultations

There is marked variation in patterns of referral and the delivery of specialty services. The variation seems to be less often

dependent on the patient than on the supply of resources and the usual practice patterns of the community (Wennberg, 1999; de Jong et al., 2006). Ideal Micro Practices are investigating ways to standardize the process of shared decision making so that the values of the patients have a significant influence on the services they receive when they are not under the direct care of their usual doctor. We believe that the structure of Ideal Micro Practices should lend itself to more effective shared decision processes than usual care (O'Donnell et al., 2006).

CAVEATS

It is too early to state definitively that Ideal Micro Practices have better clinical outcomes. However, important measures of care process are much higher for Ideal Micro Practices than measures for usual care.

Ideal Micro Practices vary in size from 1 clinician to several working in tandem, but the ultimate size and scale has yet to be determined. Although we have considerable experience in staffing patterns to support the work, we cannot state with certainty the optimal arrangement for a particular practice. For example, care management can take many forms. We recommend that care management in most situations assist patients with problem solving. The work of problem solving can be applied sparingly to patients with the highest need or spread to those with moderate need, driving much higher staffing needs in the practice. These choices will change the financing requirements in practice.

Would there be enough primary care workforce if all primary care physicians suddenly shifted to this mode of practice? Although the appeal of an enjoyable, efficient, patient-

centered practice is great, the likelihood of a sudden workforce shift seems remote because so many practices are locked in the status quo to support large overheads. There is no reason why Ideal Micro Practices cannot expand their patient panels as they and their patients gain expertise in the collaborative care process.

SUMMARY

Ideal Micro Practices are financially viable, emerging models for delivering high-quality, patient-centered, collaborative care in a way that increases the joy of the workforce. Ideal Micro Practice is not synonymous with "concierge medicine" and "retainer practice." The efficiencies of the low-overhead model and careful planning of resources needed to support patient care allows Ideal Micro Practices to be financially viable without requiring more money to provide high-quality care. Patients report improved processes of care—the type of care that should lead to a net reduction in overall healthcare costs. Further study is needed to evaluate hospitalization rates and the effects on healthcare spending and, if the promising early trends continue, a model for rapid dissemination.

Phase 1 participating Ideal Micro Practices—*California*: Dr Gary Seto; *Colorado*: Dr Michelle Eads; *Illinois*: Drs Kevin Egly and Angela M. Egly; *Kansas*: Dr Ronald Edwards; *Maine*: Drs Jean Antonucci and Earl Freedman; *New Mexico*: Dr Nancy Guinn; *New York*: Drs Scott Clemensen, Donald Goldman, Linda Lee, and Gordon Moore; *Ohio*: Dr Vanessa Boyce; *Oregon*: Dr Joanne Holland; *Rhode Island*: Dr Lynn Ho; *Virginia*: Drs John Brady, Kevin Fergusson, and Linda George; *Washington*: Dr Gwen Hanson.

REFERENCES

- Audet, A-M. J., Doty, M. M., Shamasdin, J., & Schoenbaum, S. C. (2005). Measure, learn, and improve: Physicians' involvement in quality improvement. *Health Affairs*, 24(3), 843-853.
- de Jong, J. D., Westert, G. P., Lagoe, R., & Groenewegen, P. P. (2006). Do physicians adapt their length of stay decisions to what is usual in the hospital where they work? *Health Services Research*, 41, 374-394.

- Moore, L. G. (2002a, February). Going solo: Making the leap. *Family Practice Management*, 29-32.
- Moore, L. G. (2002b, March). Going solo: One doc, one room, one year later. *Family Practice Management*, 25-29.
- Moore, L. G., & Wasson, J. H. (2006). An introduction to technology for patient-centered, collaborative care. *Journal of Ambulatory Care Management*, 29(3), 195-198.
- O'Donnell, S., Cranney, A., & Jacobsen, M. J., Graham, I. D., O'Connor, A. M., & Tugwell, P. (2006). Understanding and overcoming the barriers of implementing patient decision aids in clinical practice. *Journal of Evaluation in Clinical Practice*, 12(2), 174-181.
- Ostbye, T., Yarnall, K. S., Krause, K. M., Pollak, K. I., Gradison, M., & Michener, J. L. (2005). Is there time for management of patients with chronic conditions in primary care? *Annals of Family Medicine*, 3(3), 209-214.
- Sox, H. C. (2003). Saving office practice [Editorial]. *Annals of Internal Medicine*, 139(3), 227-228.
- Wasson, J. H., Ahles, T., Johnson, D. J., Kabcenell, A., Lewis, A., & Godfrey, M. M. (2006b). Resource planning for patient-centered, collaborative care. *Journal of Ambulatory Care Management*, 29(3), 207-214.
- Wasson, J. H., & Benjamin, R. (2006). Postscript: Health disparity and collaborative care. *Journal of Ambulatory Care Management*, 29(3), 233-234.
- Wasson, J. H., Johnson, D. J., Benjamin, R., Phillips, J., & Mackenzie, T. A. (2006a). Patients report positive impacts of collaborative care. *Journal of Ambulatory Care Management*, 29(3), 199-206.
- Wasson, J. H., Sauvigne, A. E., & Mogielnicki, R. P., Frey, W. G., Sox, C. H., Gaudette, C., et al. (1984). Continuity of outpatient medical care in elderly men: A randomized trial. *JAMA*, 252(17), 2413-2417.
- Wennberg, J. E. (1999). Understanding variations in healthcare delivery. *New England Journal of Medicine*, 340, 52-53.

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“Patient Portals” and “E-Visits”

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Abstract: “Patient Portals” enable patients to review their medical record and add information to it. Clinics are using “E-Visits” to substitute for a face-to-face office visit. This article describes the experience of one healthcare system with “Patient Portals” and “E-Visits.” **Key words:** *E-visit, patient e-mail, patient portals*

THE telephone was the first electronic communication technology to have a major impact on the delivery of healthcare. Telephones are currently the technology for the initiation of care such as making an appointment. The telephone is also a very useful way to provide care as an adjunct to, or as a substitute for, usual care. However, as it is a spoken interchange, the limitation remains that the discussion may remain undocumented.

Electronic mail, the Internet, and interactive voice recognition are new technologies that support “Patient Portals.” With “Patient Portals” patients participate in administrative actions (such as appointment scheduling, medication refills, or billing) and clinical issues (such as correction of medications and allergy lists or review of test results). Through some “Patient Portals” patients can now review their medical record and add information to it about issues that matter to them. And some clinics are using “E-Visits” to substitute for a face-to-face office visit. This article describes the experience of one healthcare system with “Patient Portals” and “E-Visits.”

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DARTMOUTH-HITCHCOCK EXPERIENCE WITH PATIENT PORTALS

Dartmouth-Hitchcock is a comprehensive, multispecialty group practice in northern New England, composed of more than 900 primary and specialty care providers throughout New Hampshire and Vermont.

Dartmouth-Hitchcock’s patient portal, Patient Online (POL), is currently deployed in the Concord, Manchester and Nashua Group Practices, located in the southern part of New Hampshire and several primary and specialty care departments at the Dartmouth-Hitchcock Medical Center in Lebanon, NH.

Our first use of POL focused primarily on administrative features. Our goal was to eliminate the inefficiencies of the telephone by taking data from our practice management system and making it available to patients. The practice management system supports scheduling, demographic information, billing, and the creation of a medical record in our clinics. Patients use the application to request updates to the information, request appointments or medication renewals, or message their healthcare team.

From the onset, we found that the clinical messaging feature was (and continues to be today) the most popular feature of the portal. Patients want to have clinical conversations with their healthcare teams (Fig 1).

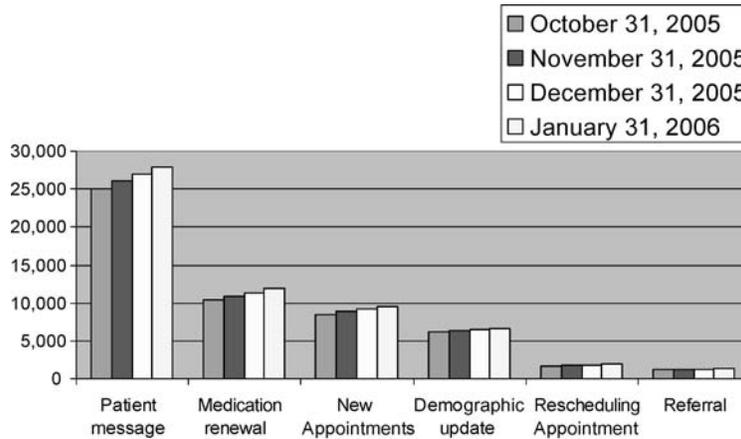


Figure 1. Dartmouth-Hitchcock patient requests—cumulative.

Medication renewal and appointment requests are the next most popular features with demographic update and referral requests following these.

As it was clear from the usage statistics that the portal was most valuable to them for clinical connections, we next offered POL for review allergies and medications and results documentation associated with radiology and laboratory testing. From December 4, 2005, through January 31, 2006, our POL activity surrounding these features is illustrated in Table 1.

This table documents that patients most commonly review medications, request medication renewals, make inquiries about medications, and correct medication documentation. Patients less often have inquiries about laboratory test results and least often report allergies.

DARTMOUTH-HITCHCOCK EXPERIENCE WITH “E-VISITS”

To extend the clinical utility of POL, we now offer patients an option for “E-visiting”

Table 1. When patients electronically review their medical records

Patient review of allergies and medications	Patient review of test results	Patient inquiries and actions resulting from their review of allergies, medications, and tests
3369 patients looked at the medication page 30,566 times	2530 patients looked at test results 11,424 times	1369 patients requested 4013 medication renewals
2001 patients looked at the allergy and immunization page 6192 times	1313 patients looked at result details 4835 times	189 patients added 285 medication to their lists
1467 patients looked at the medication details page 5291 times		152 patients asked 260 questions about a medication
		77 patients asked 93 questions about test results
		22 patients reported 38 allergies
		4 patients asked 4 questions about an allergy
		2 patients asked 2 questions about an immunization

a provider with whom they have had a previously established therapeutic relationship. Patients may choose an E-visit for advice, diagnosis, and therapy that previously would have required a face-to-face interaction in the office. There is a fee assessed for this service.

Here is how it works. Through the secure Web site, a patient requests an E-visit with a provider whom they have seen in the past, outlining the reason for the E-visit in the request. Patients supply credit card information at the time of the request. This is used for billing completed E-visits.

A clinical support person receives the request and brings it to the attention of the provider. The provider determines whether the described reason for the E-visit meets criteria. E-visits are not intended for emergency care, conditions with a significant visual diagnostic component, clarification of issues from previous visits, or diagnostic results reporting.

When accepted, the provider signs into the POL application and sends a response to the patient. If additional information or a return response is required from the patient, the E-visit is left open until the response is re-

ceived. Once the E-visit is complete, the provider ends the e-visit in the system, documents the encounter in the EMR, and provides an ICD-9 diagnosis code. The system generates an E-visit charge that is processed through the billing system to the patient's insurance company.

So far, 9 physicians have had experience with E-visits and report that it is an easy and efficient way for them to provide care to their patients outside the office setting. The most common uses have been for chronic conditions follow-up (diabetes, hypertension, anemia, and depression) and acute episodes of chronic conditions (back pain and sinusitis).

SUMMARY

"Patient Portals" greatly expand the opportunities for productive interaction between patients and healthcare profession. They offer tremendous potential to supplement (not replace) the face-to-face doctor-patient relationship, and—by extension—to enable patients to become better informed and more active participants in their own healthcare.

Engaging Quad/Graphics Employees in the Improvement of Their Health and Healthcare

Raymond J. Zastrow, MD; Len Quadracci, MD

Abstract: In an era when rising healthcare costs threaten the competitiveness of American businesses in an increasingly global marketplace, we describe Quad/Graphics on-site primary care (QuadMed) clinics tightly integrated with wellness, fitness, rehabilitation, and occupational medicine. We further describe the Lean You wellness program recently put in place to stem the rising burden of obesity. The Lean You program illustrates how an integrated employer and health provider system can become even more engaged in collaborative care with its employees. Financial and clinical data suggests that at Quad/Graphics-QuadMed, these full-service health service approaches are effective. **Key words:** *employee health service, occupational health*

BUSINESS owners throughout the United States are increasingly voicing their frustration with the cost and quality of the healthcare they purchase on behalf of their employees. At the time of this writing, the long-term viability of one American manufacturing icon, General Motors, is in doubt, owing to the ever-escalating cost represented by employee and retiree healthcare benefits. Although this trend is only now reaching a crisis flashpoint, it has been simmering for at least a decade, during which US companies have been feeling the steadily worsening pressure of healthcare inflation.

Beginning 15 years ago, Quad/Graphics, headquartered in Southeastern Wisconsin, pioneered an approach to the on-site provision of primary care. The purpose of this article is to describe the QuadMed Model and provide specific data describing the Lean

You incentivized wellness program that invites Quad/Graphics employees to improve their health and healthcare.

WHY IS QUAD/GRAPHICS IN THE HEALTHCARE BUSINESS?

In the late 1980s, the late Harry V. Quadracci, founder of Quad/Graphics, began to question the value of the healthcare he was purchasing for his employees. Healthcare costs were rising out of proportion to other overheads, and he had very little objective data to demonstrate the value of the services purchased. In 1991, he initiated QuadMed with a single physician provider. From its inception, QuadMed has focused on health and wellness and in integrating these into a primary care model that was untraditionally located on the campuses of the various Quad/Graphics printing plants.

Ever since, the motto for the employee-owners of Quad/Graphics has been "We'll keep you well; and by the way, if you get sick, we'll take care of that, too."

In addition to its 12,000 employees, Quad/Graphics, through its wholly owned subsidiary QuadMed, provides healthcare

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benefits for approximately twice that number of their dependents. The success of this arrangement has not gone unnoticed, especially after a 2005 front-page article in the *Wall Street Journal* (Fuhrmans, 2005), and QuadMed has begun the process of diffusion of the model to other like-minded companies.

WHAT EXACTLY IS THE QUADMED MODEL?

The QuadMed Model springs directly from the social contract that Quad/Graphics has with its employees. Growing as it did from a small family business, Quad/Graphics strives to maintain a culture of “family” throughout its many workplaces. Turnover is low and employee satisfaction is taken very seriously. Quad/Graphics is self-insured and the health-care benefit is structured in such a way that employees have an incentive to use the on-site clinics preferentially; typically, approximately 80% of Quad/Graphics employees and their dependents do so.

Goals for QuadMed include controlling costs by providing a full range of healthcare services and enhancing the quality of care delivered by implementing best-practice guidelines and protocols. QuadMed seeks to improve patient access to care by providing convenient, high-quality facilities located at the worksite. The on-site clinics are large, open, modern, and very attractive. The QuadMed primary care model encompasses family practice, internal medicine, pediatrics, and obstetric/gynecologic services delivered on-site both by board-certified physicians and physician extenders.

QuadMed has its own full-service pharmacy tightly integrated to the clinics’ e-prescribing capability, with prescriptions shuttled to plants that do not yet have a pharmacist on-site. Selected specialties including dermatology; ear, nose, and throat; orthopedics; and general surgery are available on-site as well.

In addition to providing on-site primary care and selected specialty care, QuadMed has restructured the delivery of primary care such that providers receive salary, and are not paid based on “production.” The providers are pur-

posely unhurried, scheduled to see patients at a rate of 2 per hour. In this way, the primary focus, regardless of the presenting complaint, remains that of preventive health maintenance and the active promotion of wellness. For those patients who are diagnosed with a chronic condition, QuadMed actively engages disease state management to slow the progression of disease. Providers’ incentives are based on quality of services rendered, including customer satisfaction, adherence to guidelines, provision of preventive services, collegiality, and participation in governance.

For specialists not on site, a high-performance network of specialists has been carefully cultivated and is revisited on an ongoing basis. In addition, QuadMed has Alcohol and Other Drug Abuse and Employee Assistance Program functions integrated into the clinics. QuadMed also offers optometry and dental services in selected facilities. Quad/Graphics has developed an in-house third-party administration function as well. The in-house third-party administrative function is in close contact at all times with medical direction, and issues of coverage tend to be resolved quickly.

Patients with a potential occupational condition are encouraged to seek out the provider they feel most comfortable with for their potential workman’s comp related issue. The majority choose to use their primary provider at QuadMed. The Quad/Graphics philosophy regarding a “bad back” is that it does not matter if it developed at home while putting in the garden or lifting on the worksite—it still deserves appropriate care and attention, hence the focus on on-site rehabilitation. QuadMed consciously designed the adjacency of rehabilitation to fitness on-site to facilitate the seamless transition of patients from one discipline to the next as they return to the workforce.

HAS THE MODEL BEEN SUCCESSFUL?

Performance metrics are in place to track both clinical and financial outcomes of care. QuadMed has collected data regarding average healthcare costs for employee and finds that even when healthcare costs are adjusted

Table 1. QuadMed quality of care analyses for September 2004*

Clinic visit analysis	
Convenient location	1.6
Ease of access by phone	1.5
Wait in lobby	1.7
Wait in examination room	1.6
Time spent with provider	1.5
Adequacy of explanation	1.4
Technical skills of provider	1.6
Personal manner of provider	1.3
Overall visit	1.5

*1 = excellent; 2 = very good; 3 = good; 4 = fair; 5 = poor

for our employees' demographics and benefit design, the cost is consistently 17% to 20% below that which other comparable employers in the Midwest are paying. The patient satisfaction survey using Health Plan Employer Data and Information Set (HEDIS) measures rank consistently in the excellent to very good range with respect to convenience in location, ease of access by phone, waiting times, time spent face to face with the provider, adequacy of explanation, and the technical skills and personal manner of the provider. Other HEDIS measures of clinical outcomes demonstrate superior performance in clinical measures, including the provision of immunizations, cesarian section

deliveries, and hypertension management. Active disease state management programs, enabled to a very large extent by electronic medical records technology are in place for asthma and diabetes mellitus and demonstrate consistently superior results in both "process" measures as well as measures of clinical outcomes when benchmarked against our peers (Tables 1 and 2).

ENGAGING EMPLOYEES AND DEPENDENTS IN THE IMPROVEMENT OF THEIR HEALTH AND HEALTHCARE: THE "LEAN YOU" PROGRAM

Quad/Graphics' goal is to improve the health of its employees whenever and wherever possible. Quad/Graphics understands that employees who are actively engaged in maintaining and improving their health will attain the best health outcomes.

Obesity is a common problem for Quad/Graphics employees. Overweight or obese employees, compared with those who are not, report higher costs of healthcare and time lost for work, more diseases and bothersome problems, more risky health habits, and less ability to manage problems. Clinical markers of disease control also tend to be worse (Table 3). Clearly, obesity is an important marker for problems that can have many adverse impacts for both the employer and employee.

Table 2. Comparison to guidelines and national averages (on NCQA* measures)

	QuadMed, %	National, %
Acute myocardial infarction		
Lipid panel in the last year	98	80
LDL less than 130	81	62
On β -blocker	100	94
Immunizations		
Age 2 up to date	98	68
Age 13 up to date	88	50
Cesarean section deliveries	12	26
Hypertension medication	92	40

*NCQA indicates National Committee for Quality Assurance.

Table 3. Employees' self-report of factors associated with being overweight*

	BMI [†] <25 (n = 592), %	BMI 25-30 (n = 608), %	BMI 30+ (n = 433), %
Cost and healthcare utilization			
Not fully functional while at work [‡]	8	9	11
Any days home with illness [§]	13	14	21
Any days in hospital	4	5	7
Taking 3 or more medicines a day	6	7	17
Disease and bothersome problems			
Hypertension	6	10	24
Diabetes	2	2	5
Moderate or severe pain	4	6	9
Often or always emotional problems	4	4	8
Limited physical function	1	2	5
Health habits			
Not eating well or avoiding general risks	9	17	36
Smoking	13	16	17
Told to cut back on alcohol	7	11	12
Not exercising regularly	36	48	68
Self-care ability			
Not confident to manage health problems	35	40	55
Clinical markers			
Last blood pressure more than 150	1	4	6
(If diabetic) Blood glucose levels generally <i>not</i> 80-150	14	29	65
Last cholesterol level >200	5	15	15

*Data are from www.HowsYourHealth.org.

[†]BMI indicates body mass index.

[‡]In 2 weeks.

[§]In 3 months.

^{||}In 1 year.

Recognizing that obesity is a prevalent condition with important adverse consequences, QuadMed sought to undertake a program to provide incentives to QuadGraphic employees to reduce their body mass index (BMI) to healthier levels.

The first step was to document the extent of the problem. From our third-party administration function we determined that, not surprisingly, the costs incurred by obese patients was directly proportional to the amount of obesity present as measured by the BMI. Initiated in pilot fashion in 2004, the Lean You program was rolled out to all Quad/Graphics employees in 2005 and expanded to employees' spouses in 2006. In addition to weight

loss, the program focuses on achieving milestones in smoking cessation, reaching goal low-density lipoprotein (LDL) level, and early identification and management of hypertension and diabetes. Any additional preventive health screening specific to the individual is also addressed at the screening visit, such as mammography, prostate-specific antigen, colonoscopy, etc.

The enrollees are subsequently oriented to the fitness center and, as part of the program, log in at least 3 sessions of exercise a week either at the fitness center or off-site but document their exercise on their personal Web page. Lean You enrollees who meet the milestones are eligible to receive a check at the

end of the year for \$250 applied against their out-of-pocket healthcare expenditures (which keeps the amount received pretax) and are entered in a drawing for a Disney World trip for the entire family. It should be emphasized that employees who already meet the Lean You criteria at the time of enrollment are eligible to receive awards—not merely those who might benefit from weight loss. (This broad perspective makes sense because persons with “good” BMIs may have problems, poor health habits, or insufficient confidence to manage health issues [Table 3])

Of 10,500 eligible employees, 22% enrolled in the first year and 24% of these completed the program and were eligible for awards. Our experience to date indicates that the Lean You program alone will not engage all employees and that those who are obese do not participate more often than those who are not obese. However, through this and other initiatives, QuadMed is becoming more effective in addressing “what matters” to employees and dependents regardless of their BMI.

As time passes, “Lean” and “Non-Lean” employees will see how engagement in QuadMed programs is of real benefit to them. For example, during the process of performing the enrollment physical evaluations for Lean You, QuadMed providers uncovered 1 colon cancer (probable cure), 2 breast cancers (probable cures), and 1 renal cancer (hopeful cure). In addition, 86 enrollees with hyperlipidemia (LDL >160), 18 with hypertension (systolic BP >150), and 16 potential diabetics (glucose >150) were uncovered. In the first year of operation, Lean You cost the Quad/Graphics corporation \$240,000 above and beyond its usual healthcare expenditure, which was broken out as follows: administration, \$35,000; support/professional staff time, \$45,000; supplies, communication, and promotion, \$30,000; and awards (incentive), \$130,900. If one uses a conservative estimate

of \$550,000 saved from the early detection of each cancer, based entirely on the case finding of the 4 cancers, Lean You in its first year of operation already demonstrated a positive financial return to Quad/Graphics of \$1,959,100.

CONCLUSION AND FUTURE PLANS

The QuadMed model integrates under one roof preventive care and wellness, occupational health services, and direct contracting with a narrow network of high-performing, high-quality, cost-effective specialists. Workman’s compensation is integrated into primary care services on-site, supported by robust information systems that provide measurable outcomes of success, both clinical and financial.

As part of its “Lean You” program, QuadMed is engaging its employees in the “production” of good, collaborative care. As QuadMed moves into the production of collaborative care, it is learning that

- It will need to continuously test methods to increase employees’ participation. We believe that incentives work well over time in a setting where the employer and the healthcare system create seamless, “user-friendly” ways to meet the employee “where they live.”
- It must make sure that “what matters” to the employee is central to any plan for effective self-care. For example, QuadMed plans to fully exploit information technology by facilitating employees’ access to care and information tailored to their needs via an Internet-based patient portal.
- It must be prepared to continuously assess, respond to, and support a broad spectrum of issues and concerns of employees at the worksite, in the clinic, or at home.

REFERENCE

- Fuhrmans, V. (2005, February 11). One cure for high health costs: In-house clinics. *Wall Street Journal*, CCXLV(30), 1.

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Patient-centered Collaborative Care Employer-led Business Coalition Vision for Action

Andrew Webber, BA; Suzanne Mercure, BA

Abstract: Employers influence healthcare delivery. Two spheres of influence include (i) what is done at each worksite and by each employer (plan design and communications as well as health plan contracting) and (ii) what is done collectively in both private and public sectors to address performance and to encourage the physicians to adopt practice changes. The need for change toward patient-centered care is the subject of this article. **Key words:** *business, business coalitions, employers, patient-centered care, value-based purchasing*

EMPLOYERS INFLUENCE HEALTHCARE

Employers influence healthcare as individuals and as members of coalitions (National Business Coalition on Health [NBCH], 2005a, 2005b). Sometimes the influence is demonstrated directly in the way money is spent: for example, various forms of pay for performance. Sometimes the employer will actually participate in the delivery of innovative care: the story of Quad/Graphics is a good example (Zastrow & Quadracci, 2006). Most often, employers influence healthcare through a combination of collective discussions, negotiations, and actions.

Employers have become increasingly interested in the ways that patient-centered

care can improve the health and well-being of employees/dependents/patients. The concept of patient-centered care has been reinforced by the Institute of Medicine's Aim 3: "Healthcare Must Be Patient-centered" (Safran et al., 2006). Recent publications sponsored by the Commonwealth Fund support the concept of measuring patient experience as both a feasible and a reliable way of improving patient-physician interactions (Davis et al., 2005).

Figure 1 shows the roles that employers and coalitions can play in furthering the movement toward patient-centered care with physicians and the local community.

THE NBCH STIMULATES PATIENT-CENTERED CARE

Coalitions support the tenets of value-based purchasing, which seeks the highest quality at the most reasonable cost. Patient-centered care—increased consumer satisfaction and patient self-engagement coupled with practice efficiencies and better integration of care—supports value-based purchasing (Committee on Quality of Healthcare in America, 2001; Gerteis et al., 1993; Joint Commission

From the National Business Coalition on Health, Washington, DC (Dr Webber); and Barrington & Chappell, Fredericksburg, Va (Dr Mercure).

The National Business Coalition on Health would like to acknowledge the generosity of the Commonwealth Fund in supporting business coalition efforts to engage with the medical community to promote patient-centered care.

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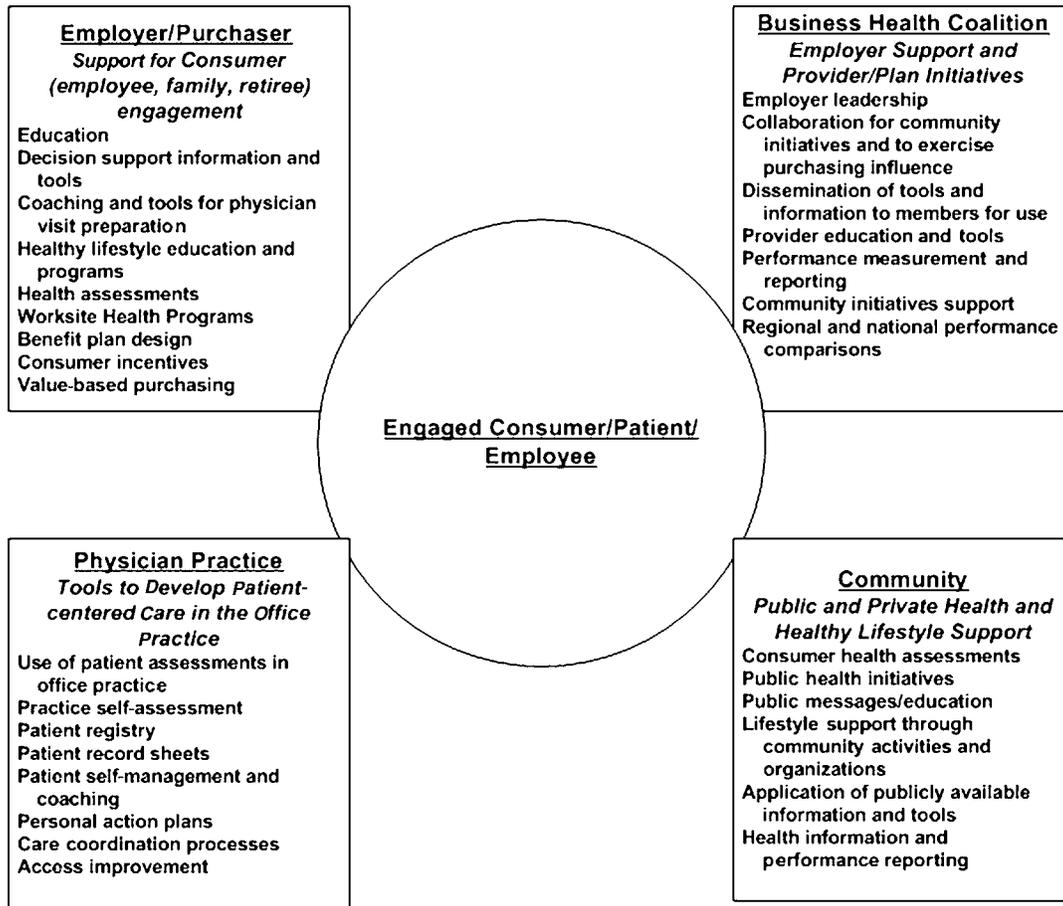


Figure 1. Employers and employer-led coalitions: Actions to promote patient-centered care development.

on Accreditation of Healthcare Organizations, 2006). A coalition can provide information and education to its members—private and public sector employers—to promote the use of tools for patient-centered care. In addition, a coalition can provide leadership in community collaboration and initiatives for patient-centered care.

The NBCH supports member coalitions with tools, promising practice information and project support. Figure 2 illustrates the NBCH value-based purchasing vision of patient-centered care and the corresponding employer and coalition roles of influence.

The use of How's Your Health? as an assessment tool by consumers is the beginning of patient engagement that crosses all the dimensions of patient-centered care (Wasson & Benjamin, 2005). The tool assesses how a con-

sumer experiences a physician practice. It helps in establishing a patient registry, patient self-management and coaching, and patient personal action plans (Wasson & Benjamin, 2005). Using How's Your Health? as described with leadership from the business community can also build on existing community resources such as quality improvement organizations (Luce et al., 2004; Wasson & James, 2001).

SUMMARY

Lack of understanding about "What's in it for me?" is an important barrier to engagement in patient-centered care by an employee, employer, coalition, physician, and community. This article provides an overview of patient-centered care and a specific example

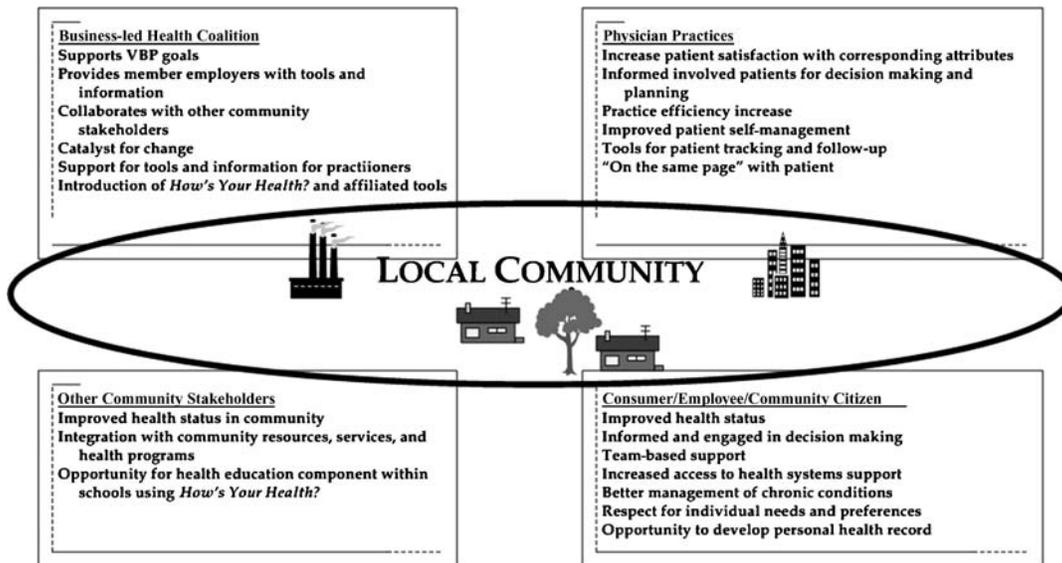


Figure 2. Value-based purchasing perspective on stakeholder benefits of patient-centered care with *How's Your Health* and affiliated tools.

of how a business coalition can embrace and foster patient-centered care. Efforts to exert external pressure for change to promote patient-centered care are embraced by

the NBCH (Galvin, 2005). Education regarding tools and sharing of experiences from their use are next steps for the NBCH with its members.

REFERENCES

- Committee on Quality of Health Care in America, Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press.
- Davis, K., Schoenbaum, S. C., & Audet, A-M. (2005). A 2020 vision of patient-centered primary care. *Journal of General Internal Medicine*, 20(10), 953-957.
- Galvin, R. (2005, January 12). "A Deficiency of Will and Ambition": A conversation with Donald Berwick [Interview]. *Health Affairs*.
- Gerteis, M., Edgeman-Levitan, S., Daley, J., & Delbanco, T. L. (Eds.). (1993). *Through the patient's eyes: Understanding and promoting patient centered care*. San Francisco, CA: Jossey-Bass.
- Joint Commission on Accreditation of Healthcare Organizations. (2006). *Patients as partners: How to involve patients and families in their own care*. Washington, DC: Joint Commission on Accreditation of Healthcare Organizations.
- Luce, P., Phillips, J., Benjamin, R., & Wasson, J. H. (2004). Technology to support community health alliances. *Journal of Ambulatory Care Management*, 27, 399-407.
- National Business Coalition on Health. NBCH annual report. (2005a). Retrieved from http://www.nbch.org/documents/2005annual_report.pdf
- National Business Coalition on Health. (2005b). NBCH member coalition inventory and case studies, 2004-2005, with funding support from CDC. (2005). Retrieved from www.nbch.org
- Safran, D. G., Karp, M., & Coltin, K. (2006). Measuring patients' experiences with individual primary care physicians: Results of a statewide demonstration project. *Journal of General Internal Medicine*, 21(1), 13-21.
- Wasson, J., & Benjamim, R. Crossing the quality chasm: A new health care system for the 21st century. *How's Your Health?* (pp. 48-51). New Hampshire: FNX Corporation. Retrieved from www.howsyourhealth.org
- Wasson, J., & Benjamim, R. (2005). *How's Your Health?* New Hampshire: FNX Corporation. Retrieved from www.howsyourhealth.org
- Wasson, J. H., & James, C. (2001). Implementation of a web-based interaction technology to improve the quality of a city's health care. *Journal of Ambulatory Care Management*, 24, 1-12.
- Zastrow, R. J., & Quadracci, L. (2006). Engaging Quad/Graphics employees in the improvement of their health and healthcare. *Journal of Ambulatory Care Management*, 29(3), 225-229.

Postscript

Health Disparity and Collaborative Care

John H. Wasson, MD; Regina Benjamin, MD, MBA

Abstract: In this report, we compare healthcare processes for patients with low ($n = 7467$) and adequate financial status ($n = 43,701$) after adjustment for age, gender, burden of illness, and health behaviors. Patients with low financial status were 10% to 30% less likely to report good service and collaborative care; they report that markers of disease management and prevention were 7% to 18% below the levels of patients with adequate income. From the patient perspective, these results confirm that inadequate financial status has a broad and adverse influence on health and healthcare. Technology for patient-centered, collaborative care alone will not remedy the problem of health disparity. **Key words:** *healthcare quality, health disparities, socioeconomic status*

WHEN examined by professionals, healthcare in the United States falls far short of expectations (Asch et al., 2006). Several articles within this issue of the *Journal of Ambulatory Care Management* confirms the many inadequacies of current healthcare from the patient perspective (Moore & Wasson, 2006; Wasson et al., 2006a, 2006b). Poor socioeconomic status (SES) and race confer additional risks for inadequate healthcare processes and outcomes (Asch

et al., 2006; Fiscella, 2004; Trivedi et al., 2005; Wasson et al., 2006b).

Table 1 lists deficiencies of clinical management for patients of low SES. The table also lists health system characteristics and collaborative processes that can be addressed to improve healthcare. For example, we have previously demonstrated how markers of management are highest for patients who report collaborative care regardless of demographics or illness burden (Wasson et al., 2006a).

Collaborative care alone will certainly not eliminate SES or racial disparity. In fact, the technologies we have described to improve collaborative care are less likely to be available for low-SES populations. It is the job of healthcare professionals to determine what actions lead to the most efficient and effective collaborative care for the most vulnerable among us (Lurie, 2005).

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Measures	Risk ratio for poor compared to adequate financial status*	Adjusted 95% confidence interval [†] (n = 7467/43701)
Health system characteristics		
Very easy access to care	0.72	0.69-0.75
Identifies a continuity clinician	0.90	0.89-0.92
Efficient care	0.92	0.90-0.94
Collaborative processes		
Very good information about functional limitations or chronic disease	0.70	0.66-0.74
Very confident to control and manage health problems or concerns	0.72	0.69-0.72
Markers of management		
Mammogram in past 2 years (age 50+)	0.93	0.90-0.96
Most recent blood pressure less than 150 systolic (among those with diabetes, hypertension, or cardiovascular disease)	0.85	0.81-0.89
Most recent cholesterol level less than 200 (among those with diabetes, hypertension, or cardiovascular disease)	0.82	0.77-0.87
Blood sugar always 80-150 (among diabetics)	0.82	0.67-1.01

*Response to the question "Do you have enough money to pay for the essentials such as food, clothing, housing?"—Yes, always; Sometimes; No. "Yes, always" indicates adequate financial status. In one typical city in the United States that used HowsYourHealth, respondents were asked to indicate their race. Seventeen percent of the whites had poor financial status versus 29% of nonwhites.

[†]Adjusted for age, gender, burden of diseases and functional limitations, number of medications, and health behavior or risk avoidance (such as eating well, using seatbelts, smoking, exercising, not drinking excessively, or not being overweight).

REFERENCES

- Asch, S. M., Kerr, E. A., Keeseey, J., Adams, J. L., Setodji, C. M., Malik, S., et al. (2006). Who is at greatest risk for receiving poor-quality health care? *New England Journal of Medicine*, 354(11), 1147-1156.
- Fiscella, K. (2004). Socioeconomic status disparities in health outcomes. *Medical Care*, 42, 939-942.
- Lurie, N. (2005). Health disparities—Less talk, more action. *New England Journal of Medicine*, 353, 727-729.
- Moore, L. G., & Wasson, J. H. (2006). An introduction to technology for patient-centered, collaborative care. *Journal of Ambulatory Care Management*, 29(3), 195-198.
- Trivedi, A. N., Zaslavsky, A. M., Schneider, E. C., & Ayanian, J. Z. (2005). Trends in the quality of care and racial disparities in Medicare managed care. *New England Journal of Medicine*, 353, 692-700.
- Wasson, J. H., Ahles, T., Johnson, D. J., Kabcenell, A., Lewis, A., & Godfrey, M. M. (2006a). Resource planning for patient-centered, collaborative care. *Journal of Ambulatory Care Management*, 29(3), 207-214.
- Wasson, J. H., Johnson, D. J., Benjamin, R., Phillips, J., & MacKenzie, T. A. (2006b). Patients report positive impacts of collaborative care. *Journal of Ambulatory Care Management*, 29(3), 199-206.

Technical Notes

When All Things Are Not Equal

John H. Wasson, MD

Abstract: This article addresses 2 questions. First, how useful is adult patients' information about health and healthcare when they use the Internet for a "health checkup"? We find that patients' reports are very strongly associated with medical record information for blood pressure, cholesterol, and blood glucose. Second, what are the biases in information from Internet respondents? Although we find that "health checkup" Internet users seem to be representative for patients in actual practice, much more research will be needed to fully address this question. **Key words:** *bias, confounding, Internet health assessment, survey responses*

FOR many of the articles in this issue of the journal, we use cross-sectional information from people who responded to an Internet survey about their health.

- One might expect Internet respondents to be different. The data may be biased in significant ways. For example, the respondents may not be similar to "typical" patients.
- One should expect that respondents are reporting their version of truth. The data may not be accurate.
- One can expect that subgroups of respondents will differ from other subgroups. The analyses may be confounded by the differences in groups.
- One could worry that analyses based on cross-sectional information confuses cause with effect.

RESPONDENT BIAS

Are people who use the Internet for a "health checkup" significantly different

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The author acknowledges Timothy Wu, Judith Harger, MSN, RN, and Carol Hamm, PhD, for validation of the patient-reported bioclinical data.

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from patients? We compared the national sample to 697 patients with the same common chronic diseases or significant causes of dysfunction from 7 primary care office practices (involving 24 physicians). The office practice patients were aged 50 years or older and had volunteered to participate in a project to improve their care. After volunteering, 82% used the same Internet site as the national sample did. Table 1 shows that the national convenience sample does not differ substantially in these fundamental characteristics from patients in primary care practice who volunteer to participate in quality improvement projects.

RESPONDENT INACCURACY

The accuracy of self-report to the Internet survey for blood glucose and cholesterol levels and systolic blood pressure was compared to the bioclinical measures recorded in the medical record. The results illustrated that the patient reports of bioclinical measures corresponded with the actual measures. For these measures, we found that patient report was generally accurate.

Others have shown that patient report about preventive measures are also quite accurate (Palonen et al., 2006).

Table 1. Patient characteristics of national respondents to an Internet health survey compared to primary care patients

Measures	US sample*		Patients from 7 primary care practices*	
	Male	Female	Male	Female
% Low financial status	11	17	9	13
Average burden of illness score	5.2	5.7	5.1	5.9
Average lifestyle score	4.3	4.4	3.9	4.2
% Days at home in the past 90 days from illness	18	28	11	24
% Days in hospital or visit to emergency department in past year	15	12	17	11

*All patients compared here are aged 50-69 and have the same common chronic diseases or significant causes of dysfunction

CONFOUNDING

Poor collaborative care is associated with poor patient outcomes (Wasson et al., 2006). Low financial status is associated with poor healthcare quality and a high burden of illness (Wasson & Benjamin, 2006). Might not differences in patient demographics and habits confound the analyses?

Because the Internet survey has complete response rates for important variables such as demographics, care quality, lifestyle, and burden of illness, we are able to use statistical techniques to base our conclusions as if "all things are equal." The adjusted analyses indicate that patient-centered, collaborative care will result in the best care in most situations (Wasson et al., 2006). The robustness

of the results is well illustrated in the separate analyses performed for the poor (Wasson & Benjamin, 2006).

LIMITATIONS OF CROSS-SECTIONAL ANALYSES

Analyses based on cross-sectional data can still confuse cause with effect. Because of this limitation, the results of cross-sectional analyses are often said to be "hypothesis-generating": the results need to be corroborated by the results of other studies. The cited literature strongly suggests that the factors we found to be associated with good outcomes are consistent with the prior published results.

Table 2. Bioclinical measures reported by patients compared to actual measures

Patient report the systolic blood pressure is	Actual average systolic pressure measure for these patients	Patient report that blood sugar is between 80-150	Actual average hemoglobin a1c for these patients	Patient report that total cholesterol is	Actual average LDL cholesterol for these patients is
130 or less (<i>n</i> = 74)	125	Always (<i>n</i> = 365)	6.8	Less than 180 (<i>n</i> = 89)	95
131-150 (<i>n</i> = 78)	145	Often (<i>n</i> = 528)	7.3	181-220 (<i>n</i> = 25)	115
150 or higher (<i>n</i> = 22)	155	Rarely, seldom, or never (<i>n</i> = 297)	8.4	221 or higher (<i>n</i> = 29)	160

REFERENCES

- Palonen, K. P., Allison, J. J., Heudebert, G. R., Willett, L. L., Kiefe, C. I., Wall, T. C., et. al. (2006). Measuring resident physicians' performance of preventive care: Comparing chart review with patient survey. *Journal of General Internal Medicine, 21*, 226-230.
- Wasson, J. H., Johnson, D. J., Benjamin, R., Phillips, J., & MacKenzie, T. A. (2006). Patients report positive impacts of collaborative care. *Journal of Ambulatory Care Management, 29*(3), 199-206.
- Wasson, J. H., & Benjamin, R. (2006). Postscript: Health disparity and collaborative care. *Journal of Ambulatory Care Management, 29*(3), 233-234.