

- 7 Arroll B, Jackson R, Beaglehole R. Validation of a three-month physical activity recall questionnaire with a seven-day food intake and physical activity diary. *Epidemiology* 1991;2:296-9.
- 8 McHorney CA, Ware JE Jr, Raczek AE. The MOS 36-item short-form health survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Med Care* 1993;31:247-63.
- 9 Lee IM, Skerrett PJ. Physical activity and all-cause mortality: what is the dose-response relation? *Med Sci Sports Exerc* 2001;33(6 suppl):S459-71; discussion S493-4.
- 10 Halbert JA, Silagy CA, Finucane P, Withers RT, Hamdorf PA, Andrews GR. The effectiveness of exercise training in lowering blood pressure: a meta-analysis of randomised controlled trials of 4 weeks or longer. *J Hum Hypertens* 1997;11:641-9.
- 11 Cook NR, Cohen J, Hebert PR, Taylor JO, Hennekens CH. Implications of small reductions in diastolic blood pressure for primary prevention. *Arch Intern Med* 1995;155:701-9.
- 12 Effects of weight loss and sodium reduction intervention on blood pressure and hypertension incidence in overweight people with high-normal blood pressure. The Trials of Hypertension Prevention Collaborative Research Group. *Arch Intern Med* 1997;157:657-67.
- 13 Intercontinental Medical Statistics Health (NZ) Limited. *Green prescriptions in general practice*. Auckland: IMS NZ, 1999.
- 14 Harland J, White M, Drinkwater C, Chinn D, Farr L, Howel D. The Newcastle exercise project: a randomised controlled trial of methods to promote physical activity in primary care. *BMJ* 1999;319:828-32.

(Accepted 13 February 2003)

Primary care in the United States

Innovations in primary care in the United States

Thomas Bodenheimer

This is the last in a series of four articles edited by Andrew Bindman and Azeem Majeed

Department of Family and Community Medicine, University of California at San Francisco, San Francisco General Hospital, 1001 Potrero Avenue, San Francisco, CA 94110, USA
 Thomas Bodenheimer
clinical professor
 tbodie@earthlink.net

BMJ 2003;326:796-9

It has been said that primary care in the United States faces the worst of times and the best of times.¹ Why the worst of times? Primary care was catapulted into prominence by the advent of health maintenance organisations; many of such organisations' 80 million patients were required to gain permission from their primary care physician to access laboratory, radiology, and specialty services. Because the number of people enrolled in health maintenance organisations is declining, more patients are free to move around the healthcare system. The United States may revert to its previous dispersed system of care, in which patients enter the specialty-dominated system through a variety of doors rather than through a single primary care entrance.

When health maintenance organisations moved primary care to a central position in health care, they expected primary care physicians to do far more for their patients than before,² yet they paid little more, if at all, for these additional tasks. Primary care physicians were looking more and more like the "hamsters on a treadmill" described in an article in the *BMJ*.³ In California, the proportion of primary care physicians very satisfied with their work dropped from 48% in 1991 to 36% in 1996.⁴ In the past few years, medical students have become less interested in making a career in primary care because of the long hours, high stress, and relatively low reimbursement of generalist physicians.⁵

The problems go beyond primary care's insecure role in the US health system: primary care is not serving patients satisfactorily. Fewer than half of patients with hypertension, diabetes, atrial fibrillation, and hyperlipidaemia—diagnoses chiefly handled at the primary care level—are well managed.⁶⁻⁹ Many patients also have difficulty obtaining an appointment with their primary care practice. From 1997 to 2001, the proportion of people reporting inability to obtain a timely appointment rose from 23% to 33%.¹⁰

Clearly, primary care clinicians are unable to handle everything piled on to their plates. Thus, the worst of times. Why, then, the best of times? One proposition explaining the work of great artists holds that suffering breeds creativity—Beethoven and Van Gogh are cited as examples. Although the situation of

Summary points

Primary care in the United States is facing difficult times: doctors are overworked and dissatisfied with it, and medical students are not very interested in it

Primary care is unable to deliver everything expected of it and offers neither timely access to acute care nor state of the art chronic care

A redesign of the primary care sector that addresses these problems is gaining acceptance in the United States

The redesign envisages the development of clinical teams, open access scheduling, implementation of a new model of management of chronic care, training patients to manage chronic conditions themselves, and group medical visits

US primary care physicians cannot be called "suffering," the proposition could be reformulated as follows: as primary care physicians have seen their problems mount and satisfaction fall, they have begun to create innovations in primary care practice (innovations that are sometimes more advanced in the United Kingdom). Examples of these innovations are: functioning primary care teams, open access scheduling, the chronic care model, collaborative physician-patient interaction, group medical visits, and the paperless electronic office. The potential for these innovations to improve primary care practice creates the "best of times."

Behind each specific innovation lies a global vision of primary care practice in the 21st century. Donald Berwick of the Institute for Healthcare Improvement, one architect of the new vision, explains: "We are carrying the 19th century clinical office into the 21st century world. It's time to retire it."¹¹ What is the vision of primary care practice in the 21st century?

Primary care teams

Physicians working alone cannot solve the problems of untimely access and inadequate management of chronic care, but with a team approach, everything changes. A patient care team is a group of diverse clinicians who participate in the care of a defined group of patients and communicate with each other regularly. Team care often means the doctor delegates routine tasks to other team members.¹¹

In a few US primary care practices such teams are functioning well. In some cases, each team might have one primary care physician, two non-physician clinicians (nurse practitioners or physician assistants), three nursing staff (nurses or medical assistants), and a receptionist. The team is responsible for a panel of 5000 patients. In larger sites, a health educator, physical therapist, and pharmacist would work with several teams. The physician might see only 10 (rather than 25-30) patients each day, focusing on those with complex problems and spending 30 minutes rather than the typical 18 minutes per patient. Patients attending with routine acute problems are handled by the non-physician clinicians, and nursing, health education, or mid-level caregivers are responsible for planned follow up of those with chronic conditions. The physician would spend considerable time consulting with and training other team members.

Advanced access

A new model of appointment scheduling, called advanced access or same day scheduling, is being used at a number of primary care practices in both the United States and the United Kingdom. In its most simple form, it means that if a doctor can see 25 patients a day but it takes patients three weeks to get an appointment, could the doctor not care for 25 patients a day but see them the same day they call? On average, the number of visits would not change, but access would go up and patients' frustration go down. When doctors practising under this new model start work each morning, about half of their appointment slots are open. Patients calling in are offered an appointment the same day.¹² As both urgent and routine problems are seen the same day, there is no need for nursing triage, freeing up nursing staff for other tasks and reducing the need to interrupt the physician.

The chronic care model

Management of chronic illness can be improved through a set of innovations known as the chronic care model, which incorporates several essential components of primary care practice.¹³ Self management support includes training patients in problem solving and goal setting. Decision support consists of making evidence based knowledge available to all physicians through clinical practice guidelines and physician education. Delivery system redesign refers to the understanding that the structure of medical practice must be altered; it includes creating practice teams with a clear division of labour, separating the management of chronic conditions from acute care by using planned visits, and case management of patients at high risk. Clinical information systems involve reminders to primary care teams to comply with practice

guidelines; feedback to physicians, showing how each is performing in managing chronic illnesses; and registers for planning individual patient care and conducting population based care.

A new area of research—evidence based management—examines which components of the chronic care model actually improve clinical process and patient outcomes. Studies suggest that planned visits to patients with chronic conditions and case management of high risk patients (two components of redesign of delivery systems) and reminder systems for clinicians (a component of clinical information systems) improve doctors' performance and, at times, patients' outcomes.^{14 15}

Clinical outcomes probably improve more when several components of the chronic care model are used together.¹⁶ A number of primary care practices, led by healthcare organisations such as Kaiser-Permanente and Group Health Cooperative of Puget Sound, and community health centres for patients with low incomes are implementing components of the chronic care model.

Collaborative care

The 21st century primary care practice envisages a patient-physician partnership with collaborative goal setting. A recent study found that in about three quarters of primary care visits physicians issue instructions to patients, such as "change your diet, take more exercise, and take your pills."¹⁷ This model often fails to encourage healthy behaviours and leads physicians to blame patients for being "non-compliant" with doctors' orders.¹⁸

Under the collaborative model, both patients and physicians define the problems that require solution, though their definitions may coincide or diverge. For example, a physician may define the problem of a diabetic patient as a raised glycosylated haemoglobin concentration, while the patient defines her problem as extreme anxiety caring for her husband with Alzheimer's dementia. Failure to tackle the problem that the patient sees will frustrate the physician's efforts to solve the problem of poor glycaemic control.¹⁹ One tool of collaborative care is the setting of goals through action plans agreed between physician and patient—a typical action plan might be to walk for 15 minutes three times a week. In the example of the diabetic patient caring for a demented spouse, the action plan might involve ways of relieving the patient from her caregiving responsibilities rather than simply trying to improve glycaemic control. Action plans should be realistic, giving the patient a strong chance of success. Some research has found that collaborative care with action plans can improve outcomes in asthma, diabetes, arthritis, and other chronic conditions.¹⁹

Group medical visits

Several US experiments in which patients see their physicians in groups rather than singly are under way. This innovation, which has spread to numerous US primary care sites, began near Denver, Colorado, when John Scott, a Kaiser-Permanente primary care physician, gave his elderly patients the option of seeing him in groups. The groups are not simply patient education sessions;

they include direct patient care. In John Scott's cooperative healthcare clinic model, 15-20 elderly patients with a variety of acute and chronic medical problems come together monthly to see their doctor, who goes around the room performing those elements of the history and physical examinations that do not require privacy and carrying out diagnostic and treatment plans for each patient. Other patients in the room listen to the interactions and may contribute ideas based on their own experience. In a randomised controlled trial, the group patients made fewer visits to emergency departments and to specialists, cost less, stayed healthier, and were more satisfied with their care.²⁰

A second kind of group comprises patients with the same diagnosis. A trial of such single diagnosis groups, conducted for patients with diabetes, found that glycated haemoglobin values of patients in groups fell by 1.3% compared with 0.2% in control subjects. Group members used outpatient and inpatient facilities less and felt more satisfied with their care.¹⁴

A third category of group medical visit is the "drop-in group medical appointment" (DIGMA) for patients with simple acute rather than chronic conditions. The purpose is to improve timely access to care, since in this way a doctor can see 15-20 patients in 90 minutes. By adding capacity to primary care practices, these group sessions can become an adjunct to open access scheduling. These sessions are not appropriate for patients with more complex and time-consuming problems.

Information technology

The ideal 21st century primary care practice would be virtually paperless—a goal to which the United Kingdom is currently nearer than is the United States. While such a digital world has great appeal, only a tiny fraction of US primary care sites have an electronic medical record, and relatively few use email and the internet to interact with patients. Studies of the electronic medical record show that it may improve quality of care but it makes extra demands on physicians' time.^{21,22} A controlled trial involving electronic registers and reminders for the care of 13 000 diabetic patients found that most physicians did not use the computerised systems available to them because they took too much time.²³

Importance of teams in primary care

None of the innovations being introduced into the United States works well without the formation of primary care teams. The chronic care model relies on medical assistants checking reminder systems and making sure that patients receive the chronic and preventive services they need. When physicians no longer have to carry out these routine chronic care tasks, they have more open appointment slots, allowing advanced access scheduling to function smoothly. Nurses or health educators, rather than physicians, can work with patients on healthy behaviour change, using action plans. Group medical visits are best with teams of physicians and nurses. When patients are able to communicate by email or the internet, staff other than doctors can handle many simple requests, thereby sparing physicians' time. Without teams, most of these innova-

tions would be unsustainable because they add to the huge workload of primary care physicians. With teams, physicians can spend more time training and supervising team members and less time seeing patients with uncomplicated problems singly. The creation of teams is the key element in primary care redesign that allows other innovations to succeed.

Conclusion

Primary care physicians in the United States who are stressed and dissatisfied may glance at a list of supposedly helpful innovations and exclaim: "Making those changes will just add to my work." Without managerial support, they are right. For that reason, innovation is commoner in large health systems with administrative leadership. To help physicians jump off the treadmill, innovations must improve quality of care or access to it while reducing doctors' workloads and not endangering the financial viability of primary care.

Funding: Robert Wood Johnson Foundation.

Competing interests: None declared.

- 1 Grumbach K. Primary care in the United States—the best of times, the worst of times. *N Engl J Med* 1999;341:2008-10.
- 2 St Peter RF, Reed MC, Kemper P, Blumenthal D. Changes in the scope of care provided by primary care physicians. *N Engl J Med* 1999;341:1980-5.
- 3 Morrison I, Smith R. Hamster health care. Time to stop running faster and redesign health care. *BMJ* 2000;321:1541-2.
- 4 Burdi MD, Baker LC. Physicians' perceptions of autonomy and satisfaction in California. *Health Aff* 1999;18:134-5.
- 5 Grumbach K, Bodenheimer T. A primary care home for Americans. Putting the house in order. *JAMA* 2002;288:889-93.
- 6 Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. 6th Report. *Arch Intern Med* 1997;157:2413-46.
- 7 Clark CM, Fradkin JE, Hiss RG, Lorenz RA, Vinicor F, Warren-Boulton E. Promoting early diagnosis and treatment of type 2 diabetes. *JAMA* 2000;284:363-5.
- 8 Samsa GP, Matchar DB, Goldstein LB, Bonito AJ, Lux LJ, Witter DM, et al. Quality of anticoagulation management among patients with atrial fibrillation. *Arch Intern Med* 2000;160:967-73.
- 9 McBride P, Schrott HG, Plane MB, Underbakke G, Brown RL. Primary care practice adherence to national cholesterol education program guidelines for patients with coronary heart disease. *Arch Intern Med* 1998;158:1238-44.
- 10 Strunk BC, Cunningham PJ. *Treading water: Americans' access to needed medical care, 1997-2001*. Washington, DC: Center for Studying Health System Change, 2002.
- 11 Wagner EH. The role of patient care teams in chronic disease management. *BMJ* 2000;320:569-72.
- 12 Murray M, Berwick DM. Advanced access: reducing waiting and delays in primary care. *JAMA* 2003;289:1035-40.
- 13 Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model. *JAMA* 2002;288:1775-9, 1909-14.
- 14 Sadur CN, Moline N, Costa M, Michalik D, Mendlowitz D, Roller S, et al. Diabetes management in a health maintenance organization. Efficacy of care management using cluster visits. *Diabetes Care* 1999;22:2011-7.
- 15 Davis DA, Thomson MA, Oxman AD, Haynes B. Changing physician performance. *JAMA* 1995;274:700-5.
- 16 Sperl-Hillen J, O'Connor PJ, Carlson RR, Lawson TB, Halstenon C, Crowson T. Improving diabetes care in a large health care system: an enhanced primary care approach. *Jt Comm J Qual Improv* 2000;26:615-22.
- 17 Gotler RS, Flocke SA, Goodwin MA, Zyzanski SJ, Murray TH, Stange KC. Facilitating participatory decision-making: what happens in real world community practice? *Med Care* 2000;38:1200-9.
- 18 Anderson RM, Funnell MM. Compliance and adherence are dysfunctional concepts in diabetes care. *Diabetes Educ* 2000;26:597-604.
- 19 Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *JAMA* 2002;288:2469-75.
- 20 Beck A, Scott J, Williams P, Robertson B, Jackson D, Gade G, et al. A randomized trial of group outpatient visits for chronically ill older HMO members. *J Am Geriatr Soc* 1997;45:543-9.
- 21 Hunt D, Haynes B, Hanna S, Smith K. Effects of computer-based clinical decision support systems on physician performance and patient outcomes: a systematic review. *JAMA* 1998;280:339-46.
- 22 Mitchell E, Sullivan F. A descriptive feast but an evaluative famine: systematic review of published articles on primary care computing during 1980-97. *BMJ* 2001;322:279-82.
- 23 Baker AM, Lafata JE, Ward RE, Whitehouse F, Divine G. A web-based diabetes care management support system. *Jt Comm J Qual Improv* 2001;27:179-90.

(Accepted 11 February 2003)

Commentary: What can primary care in the United States learn from the United Kingdom?

Azeem Majeed, Andrew B Bindman

The National Health Service is very familiar with the arrival of “experts” from the United States to tell clinicians, managers, and politicians how the United Kingdom should configure its health services. Such experts are often well received by the British government in the belief that they will somehow bring answers to the many problems that afflict the NHS. Although it is true that the NHS can learn from the experience of other healthcare systems,¹ the opposite is also true: other countries can learn from the NHS. As Bodenheimer says, two areas where the United Kingdom may be ahead of the United States are in developing multi-disciplinary primary healthcare teams and in using information technology in primary care.

Learning that the United Kingdom is ahead of the United States in developing primary care teams and in implementing information technology may seem strange to many British general practitioners, for they are often led to believe that the use of non-medically qualified clinicians in clinical settings and the use of information technology are much commoner in the United States than in Britain. However, this is not always the case. For example, the way in which British general practices are funded and, in particular, NHS subsidies of the costs of employing staff, such as nurses, counsellors, receptionists, and managers, has encouraged the development of multidisciplinary primary healthcare teams.²

The NHS has also heavily subsidised general practitioners’ investment in information technology, so that almost all practices now use clinical computer systems, and an increasing proportion of practices use computers rather than paper to record consultations. This investment in information technology in primary care has facilitated the production of local disease registers and locality-wide audits and research.³ It has also helped to rationalise prescribing and control drug costs. For example, drugs are prescribed by their generic name on over 60% of all prescriptions issued by general practitioners in England, a much higher

percentage than in the United States. The NHS intends to build on this investment, with ambitious plans to develop the use of information technology further, and in particular to develop integrated health records for use by both primary care and hospital clinicians.⁴

One of the main components of the greater success of the NHS in these areas is the “single payer” structure of the British healthcare system.⁵ Because of this, the NHS dominates the provision of health care and the employment of clinicians, giving the government great power to shape the healthcare system and to roll out innovations more uniformly and rapidly than is possible in the United States. A second factor is the proportionally larger and more unified nature of the primary care physician workforce in the Britain, which gives primary care a large role in shaping the NHS.

In contrast, the US healthcare system, with its multiplicity of private and government purchasers and providers, is much more diverse than the NHS. The primary care physician workforce is also divided into three specialties: general internists, family practitioners, and paediatricians. This diversity results in more “natural experiments” in the United States than in the United Kingdom, but much greater difficulty in implementing interventions across the entire US healthcare system.

Funding: No specific funding.

Competing interests: AM holds a national primary care scientist award funded by the Department of Health. ABB and AM have received funding for comparative research on primary care in the USA and UK from the Commonwealth Fund of New York.

- 1 Weiner J, Gillam S, Lewis R. Organization and financing of British primary care groups and trusts: observations through the prism of US managed care. *J Health Serv Res Policy* 2002;7:43-50.
- 2 Bindman AB, Majeed A. Organisation of primary care in the United States. *BMJ* 2003;326:631-4.
- 3 Hippisley-Cox J, Pringle M, Crown N, Meal A, Wynn A. Sex inequalities in ischaemic heart disease in general practice: cross sectional survey. *BMJ* 2001;322:833-6.
- 4 Delivering IT in the NHS. Department of Health: London, 2002. www.doh.gov.uk/ipu/whatnew/deliveringit/index.htm (accessed 12 Mar 2003).
- 5 Bindman AB, Weiner JP, Majeed A. Primary care groups in the United Kingdom: quality and accountability. *Health Aff* 2001;20:132-45.

Primary Care Research Unit, School of Public Policy, University College London, London WC1H 9EZ
Azeem Majeed
professor

Departments of Medicine, Epidemiology and Biostatistics, University of California at San Francisco, San Francisco, CA 94118, USA
Andrew B Bindman
professor

Correspondence to: A Majeed
a.majeed@ucl.ac.uk



A list of internet resources relevant to primary care appears on bmj.com

One hundred years ago

A medical president

M. Adolf Deucher, who was recently elected President of the Swiss Republic for the third time, is a member of the medical profession. He was born at Steckborn, in the Thurgovia Canton, in 1831, and early began to take an active part in local politics. It is said by those who have watched his career that the devotion and self-sacrifice with which he practised his profession won for him the hearts of the people, and paved his way to the distinguished position which he now holds. He became a member of the National Council in 1867. In 1883 he became a member of the Federal Council, and almost at once was elected President of the Republic. He has also served as head of nearly all the departments of State, but his principal work has been

accomplished as chief of the department of Commerce, Industries, and Agriculture. President Deucher has always taken a special interest in labour questions, and by his method of dealing with them he has gained the full confidence of the working classes. It may be added, as showing the true Republican simplicity with which Switzerland manages its affairs, that M. Deucher’s official salary as President is £720. Another noteworthy point is that that very comprehensive catalogue of persons of note, *Who’s Who?* omits his name altogether. It is doubtless sufficient for Dr. Deucher that he has the rare distinction of being most honoured by those who know him best.

(*BMJ* 1903;i:98)