



# Delivery Systems Matter!

## A Summary of Research

*The American health care delivery system is in need of fundamental change...The current care systems cannot do the job. Trying harder will not work. Changing systems of care will.*

— Institute of Medicine, 2001<sup>1</sup>

“Many of the difficulties in present medical practice can be overcome, wholly or in part, by group organization. ... Some of these difficulties are: lack of coordination ... lack of adequate supervision and control over the quality of medical care ... the difficulty experienced by patients in choosing qualified physicians; the unnecessarily large expenditure for overhead costs made by practitioners in individual private practice; and the increasing complexity of medical service.”

— Committee on the Costs of Medical Care, 1932

## A crisis of costs. A crisis of care.

America leads the world in health care spending, yet quality and patient satisfaction lag far behind. Critical information doesn't always reach the right people at the right time. The most proven treatments are not always utilized. As our population grows older, the burden of chronic illness will make these issues even more significant.

What are our options for improving the delivery of health care? Can we overcome the current problems through greater group organization as suggested in the Costs of Medical Care report from 1932?


What evidence is there that a more integrated delivery system can provide a higher standard of care? The answer, in short, is: not enough, but enough to be intriguing.

In the pages that follow, we summarize some of the recent literature that addresses this question. The studies are organized according to the requirements for improvement as defined by the Institute of Medicine:

- Redesign care processes to improve effectiveness and reliability of delivery
- Continually advance the effectiveness of teams
- Coordinate care across patient conditions, services and settings over time
- Make effective use of information technologies to make clinical information readily accessible to patients and all members of the care team
- Manage the growing knowledge base and ensure that all health care workers have the skills they need
- Incorporate care process and outcome measures into daily work

This paper is not intended as an exhaustive review of the literature on this subject. Rather it is meant as quick reference for some of the more recent publications and a starting place for more in-depth study.

WORK IN PROGRESS



The concept of improving health care delivery through the organization of physicians into medical groups is not new. The 1932 recommendation of the Committee on the Costs of Medical Care for the expansion of group practice was built upon the successful experience of a growing number of medical groups dating back three decades to the pioneering model built by the Mayo brothers in Minnesota. While the American medical establishment of the 1930s, dominated by solo-practice physicians, failed to embrace the committee's recommendation, subsequent generations of group practice advocates continue to believe fervently that systematic coordination of care by physicians practicing together offers significant advantages in cost and quality over the disaggregated delivery system that predominates to this day.

As recently as the Institute of Medicine's 2001 report, *Crossing the Quality Chasm* (perhaps the closest contemporary sequel to the 1932 report), many of the unique competencies associated with multispecialty group practice are advocated as keys to answering the continuing and escalating quality and cost problems besetting American health care. If the IOM's Chasm report is not to suffer the same neglect as its predecessor of seven decades earlier, the theoretical case for delivery system reform along the lines of organized systems of care must be buttressed by solid and persuasive evidence of its advantages.

What is the state of that evidence today? What do we actually know about the impact of delivery system organization on quality and cost of care, especially with regard to multispecialty group practice?

The answer, in short, is: not enough, but enough to be intriguing. Historically, few studies have compared types of delivery systems and determined how different organizations translate into quality or efficiency. Over the last two decades, a large body of literature has developed comparing Health Maintenance Organizations (HMOs) to fee-for-service (FFS) delivery systems. But, significantly, few studies drill down below the common financing characteristics of "HMOs" to explore differences in *physician group organization*. What organizational characteristics, such as group versus solo practice, multispecialty versus single-specialty, and capitated versus fee-for-service reimbursement, work best? Miller and Luft's comprehensive analysis of the literature on HMO effectiveness and efficiency concluded that HMOs reduce utilization without reducing quality, but noted that there is as much variability within HMOs and how they deliver care as between HMOs and other types of delivery systems (Miller and Luft, 2002). An additional obstacle to development of a robust evidence base has been the difficulty of obtaining either outcomes or process quality data from disaggregated care systems for comparison against organized care systems; while considerable data are

available from many organized systems, comparable data are generally not available from small, disaggregated practices.

With these limitations in mind, this paper summarizes some of the more recent published literature examining the relationship between delivery system organization and quality. Specifically, we asked **"What is the evidence that organized systems of care have, or are more likely to have, structural elements in place that contribute to superior quality of care?"**

What is meant by "organized systems of care?" Various organizations and researchers have attempted to define this concept (see, for example, National Business Group on Health, 2004). Frustratingly for researchers, definitions range across a broad spectrum of organizational forms, from certain Independent Practice Associations to Physician-Hospital Organizations to certain Academic Medical Groups to fully integrated prepaid group practices, such as Kaiser Permanente and Group Health Permanente. For purposes of this paper, we rely on a variation of the definition provided by Enthoven and Tollen in *Toward a 21st Century Health System: The Contributions and Promise of Prepaid Group Practice* (Enthoven and Tollen, 2004). We broaden their definition by including both capitated and fee-for-service systems. Thus, an organized system of care is one that:

- Is built on the chassis of a multi-specialty group practice;
- Receives its resources through



either per capita prepayment, fee-for-service, or a mixture of both;

- Includes physicians who practice only with that system and who have access to clinical data for a large patient population; and
- Delivers comprehensive services to the patients for which it provides care.

It is also necessary – and equally challenging – to define “quality.” For our purposes, we accept the IOM’s definition from the Quality Chasm report, in which high quality care is defined as that which is: effective, efficient, timely, safe, patient-centered, and equitable (Institute of Medicine, 2001). Unfortunately, these six quality aims, as the IOM calls them, are not themselves easily defined nor isolated in research studies. Therefore, we look to what the IOM report says are the *structural characteristics* of effective delivery systems that are needed to achieve the six quality aims (IOM, 2001, pp.111-144). They are:

- redesign to use effective and reliable care processes;
- use of effective teams;
- coordination of care across patient conditions, services and settings over time;
- effective use of information technologies;
- management of clinical knowledge and skills; and
- incorporation of performance and outcome measurement for improvement and accountability.

Each of the research studies summarized below describes a correlation between organized care

systems (or elements of organized care systems) and one or more of the IOM’s structural characteristics required for high quality health care. We have organized the studies according to the IOM structural characteristics to which they most closely relate. Note that many of the studies touch on several of these characteristics and are therefore listed several times. Within each category, studies are listed in reverse-chronological order.

This is not intended as an exhaustive review of the literature on this subject. Rather, it is meant to provide a quick reference for some of the more relevant and recent literature on the subject, and perhaps to serve as a starting place for more in-depth study of the impact of delivery system structure on quality.

## RESEARCH SUMMARIES USE OF EFFECTIVE AND RELIABLE CARE PROCESSES; KNOWLEDGE AND SKILLS MANAGEMENT

By far, the majority of research identified for this summary addresses these two IOM structural characteristics. We have grouped them together because of the close association between the existence of care management processes and management and dissemination of clinical information. In both cases, we refer to established systems, procedures, and resources in place to help physicians and their teams manage patient care.

**Solberg and colleagues (2005)** studied whether medical groups have

quality improvement (QI) priorities, approaches, activities, and congruence that will allow them to achieve major improvements in quality of care. Of the physician organizations studied in the Minneapolis/St. Paul metropolitan area, **medical groups appear to have important structural and leadership elements in place to support quality improvement.** Of 18 groups studied, 17 have a physician leader for quality improvement, nearly 100% of clinic leaders report that group leaders see QI as important, and 69 percent to 84 percent of their physicians report that clinic leaders are committed to QI for diabetes and heart disease. However, only seven groups report adequate QI resources, and only three report that incentives are aligned with quality.

**Li and colleagues (2004)** investigated the organizational factors that affect the adoption of diabetes care management processes. Of the physician organizations that treat patients with diabetes, they determined that **external incentives to improve quality, computerized clinical information systems, and ownership by hospitals or health maintenance organizations are strongly associated with the adoption and comprehensiveness of diabetes care management processes.**

**Rittenhouse and colleagues (2004)** used data from a survey of practicing physicians in California’s 13 largest urban counties to examine the influence of practice setting (IPA versus larger multispecialty group



*Advantages of groups of at least moderate size are their ability to create organized processes to proactively improve care; serve as units of analysis for which statistically reliable and valid measurements of quality can be made; and monitor clinical performance and implement clinical protocols.*

— Casalino et al., 2003

practice) on care management processes, financial incentives for quality, and practice pressures. They found that **physicians in the Permanente medical groups have adopted and value quality-oriented, system-level care management tools to a much greater degree than physicians in independent practice association (IPA) networks or traditional “cottage-industry” practices. Kaiser Permanente’s two large, integrated, multi-specialty, prepaid group practices in California were more likely to use care management processes and financial incentives linked to quality of care and patient satisfaction** (rather than reduced utilization) than IPAs, solo practitioners and other group practices.


**Schmittiel and colleagues (2004)** examined the predictors of patient and physician reminder system use for preventive services in US physician organizations. They found that **medical groups were more likely to use patient-level reminders than independent practice associations (IPAs). Use of physician reminders was, in turn, related to increases in required reporting of data and IT capabilities.** They concluded that the overall use of clinical preventive service reminders in physician organizations is low and offering quality incentives and increasing IT capabilities would increase the use of these reminders and improve care delivery.

**Shortell and Schmittiel (2004)** reported on the results of a national study of the management of chronic illness for patients with asthma, congestive heart failure, depression, and

diabetes. They found that a select group of 12 large **prepaid multispecialty medical groups were significantly more likely to use recommended, evidence-based care management processes (disease registries, reminder systems, guidelines, case management systems, etc.) and to report a positive financial impact from their investment in these processes** than other, more loosely organized groups. Comparison included other large groups of 100 physicians or more.

**Casalino, Devers, and colleagues (2003)** identified the benefits of and barriers to large medical group practice, reporting on results from the Community Tracking Study survey. They identified economies of scale, profit from ancillary services, a better lifestyle, and enhanced ability to negotiate with health plans as benefits of group practice. **Advantages of groups of at least moderate size are their ability to create organized processes to proactively improve care; serve as units of analysis for which statistically reliable and valid measurements of quality can be made; and monitor clinical performance and implement clinical protocols.**

**Casalino, Gillies, and colleagues (2003)** found that **both increased size of a medical group and affiliation with a hospital/health system or HMO had a statistically significant association with increased use of recommended care management processes designed to improve quality of care for people with chronic conditions.** These processes include disease registries, reminder



systems, guidelines, and case management systems. Further, the presence of clinical information technology was also significantly associated with increased use of recommended care management processes.

**Rundall and colleagues (2002)** surveyed nine leading medical groups to assess care management processes and clinical information system functions. They found that **“medical groups that were profitable and had a clinical information system, supportive clinical and administrative leadership, a group culture that promoted quality improvement, and incentives from health plans and other external organizations to improve quality were more likely to implement chronic disease care management processes”** (pg. 960). Barriers to implementing these systems, though, include doctors’ resistance to change and increasingly heavy workloads.

**Chehab and colleagues (2001)** examined physician job satisfaction and perceptions of managed care for prepaid group practice (PGP) and office-based practitioners. They found that PGP physicians were “significantly more satisfied with quality of practice and patient care than physicians in [office-based practice].” **Among PGP physicians, 56 percent reported that treatment guidelines made work easier and only 12 percent reported that they made it harder. Conversely, 39 percent of survey respondents in office-**

**based independent practice reported that managed care treatment guidelines made work relatively harder, while only 4 percent reported that it makes work easier.** Compared with office-based practitioners, PGP physicians were significantly more satisfied with the quality of care, “had **more positive viewpoints on the effects of treatment guidelines and drug formularies on the quality of patient care**, and had more favorable perceptions of the impact of managed care on patient care.” (pg. 205) Also, 42 percent of PGP physicians reported that formularies make their practice easier, compared to only 1 percent of office-based physicians.

#### USE OF EFFECTIVE TEAMS

**A**lthough there is not overwhelming evidence to suggest that organized care systems are more likely than other types of providers to practice in teams, several studies do touch on this issue.

**Parkerton, Smith, and Straley (2004)** assessed the influence of primary care continuity—both clinician and system—on patient outcomes within a multi-specialty group. They found that physician continuity, defined as seeing the same designated physician during one year, was not significantly related (in a positive direction) to outcomes. System continuity, however, or practice coordination, which was measured by shared practice, team tenure, and medical clinic size, was

associated with beneficial outcomes in cancer screening in women, diabetic management examinations, and patient satisfaction ratings. **Both medical clinic size and shared practice were associated with higher rates of cancer screening and diabetic management examinations. Team tenure exhibited a significant positive association with cancer screening, diabetic management, and patient satisfaction.** They concluded that larger clinics may improve access to care and information for both patients and clinicians; and that **durable and effective clinical teams may be related to effective team member interaction and strengthened roles for non-physicians.**

**Grumbach, Dower, and colleagues (2002)** examined data from a survey of California physicians. They found the rate of physician participation in private HMO plans to be decreasing—only 58 percent of patient care physicians in the state were accepting new patients if the patient had HMO insurance coverage. Likewise, the percentage of specialists with HMO patients fell from 77 percent to 62 percent between 1998 and 2001. Physicians working in Kaiser Permanente, however, consistently express more positive opinions about their practice organization than do physicians working in IPAs and other types of managed care networks. **They are more likely to work in interdisciplinary teams and receive incentives for quality of**

*Physicians in large group practices are more likely than solo practitioners to use EMRs, receive electronic drug alerts, use e-mail to communicate with colleagues and patients, and practice in a “high-tech” office.*

— Audet et al., 2004

**care and patient satisfaction and to believe that their practice organization has advantages for shared practice responsibilities and quality of care.** They are less likely to report experiencing pressures to limit referrals to specialists or orders of medical tests.

### **COORDINATION OF CARE ACROSS PATIENT CONDITIONS, SERVICES, AND SETTINGS OVER TIME**

**C**learly, more research is needed to address the performance of organized care systems in achieving coordination of care. However, an organized systems' structure, use of clinical IT, and development of effective teams suggest enhanced capabilities for coordinating care.

**Gillies and colleagues** (pending publication in the journal *Health Services Research*, as of Jan. 2006) examined the relationship between health plan organizational characteristics and performance on clinical process measures and patient satisfaction measures.

**The study found a strong relationship between the type of delivery system (i.e. IPA, network, group/staff model) and the clinical process measures and found patient satisfaction to be unrelated to these factors.**


**Asch and colleagues (2004)** compared quality of care at the highly integrated delivery system of the Veterans Health Administration (VHA) with that of care in a national sample. **The VHA has introduced an integrated electronic medical record, performance measurement, and other system-wide changes directed at improving care. The study found**

**that patients from the VHA scored significantly higher for adjusted overall quality, chronic disease care, and preventive care,** but not for acute care. The advantage was most prominent in processes targeted by VHA performance measurement activities.

**Feachem, Sekhri, and White (2002)** compared the costs and performance of Kaiser Permanente with the British National Health Service. They found that Kaiser Permanente patients receive more recommended treatment for diabetes and heart disease—for example, 93 percent of Kaiser Permanente heart attack patients receive beta blockers versus 42 percent in the United Kingdom. Also, Kaiser Permanente was more efficient, averaging 270 acute bed days per 1,000 population versus 1,000 for the United Kingdom. They concluded that **Kaiser Permanente achieved better performance at roughly the same cost as the NHS because of integration throughout the system,** efficient management of hospital use, benefits of competition, and greater investment in information technology.

### **EFFECTIVE USE OF INFORMATION TECHNOLOGIES**

**A**udet and colleagues (2004) examined the factors affecting the use of IT in clinical practice. According to their findings, **the predominant factor affecting use of IT is practice size.** Eighty-seven percent of large group practice physicians have access to electronic test results, compared to 36 percent of solo-practice physicians. Other technologies follow a similar pattern. **Physicians in large group practices are more likely than solo**



**practitioners to use EMRs, receive electronic drug alerts, use e-mail to communicate with colleagues and patients, and practice in a “high-tech” office**—defined as one where physicians routinely or occasionally use at least four of the tools referenced in the survey. How doctors are compensated also significantly affects use of IT, with 34 percent of salaried physicians working in a high-tech office, compared to 17 percent of non-salaried ones.

See also:

- Schmittiel and colleagues, 2004
- Casalino, Gillies, and colleagues, 2003
- Feachem, Sekhri, and White, 2002

## INCORPORATION OF PERFORMANCE AND OUTCOMES MEASUREMENT FOR IMPROVEMENT AND ACCOUNTABILITY

Studies summarized in this section deal generally with the presence of internal or external incentives (financial or otherwise) to measure and reward good quality.

**McMenamin and colleagues (2004)** looked at physician organizations composed of 20 or more physicians to describe the **factors positively associated with offering health promotion programs. These factors included outside reporting of quality measures; public recognition for quality measures; clinical information technology systems; being a medical group (as opposed to an IPA); and ownership by a hospital or health**

**plan.** They concluded that by offering recognition and incentives for quality improvement and by funding the expansion of information technology, the healthcare community can encourage and enable physician organizations to increase the availability of health promotion programs nationally.

**Grumbach, Osmond, and colleagues (1998)** examined data from a large survey of California physicians. They found that **prepaid group practice physicians were more likely than solo practitioners to experience payment incentives linked to quality of care and patient satisfaction.** Physicians in prepaid groups had higher job satisfaction rates and felt less compromised than colleagues in other practice types by the constraints imposed by systems of payment. “Compared to solo practitioners, physicians in staff-model or group-model HMOs felt less pressure to limit referral in a way that they felt compromised care or to limit what they told patients about treatment options in a way that compromised care, but they also felt greater pressure to see more patients.” (pg. 1519)

See also:

- Asch and colleagues (2004)
- Li and colleagues, 2004
- McMenamin and colleagues, 2004
- Rittenhouse and colleagues, 2004
- Schmittiel and colleagues, 2004
- Grumbach, Dower, and colleagues, 2002
- Rundall and colleagues, 2002

## REFERENCES

- Asch SM, McGlynn EA, Hogan MM, Hayward RA, Shekelle P, Rubenstein L, Keeseey J, Adams J, Kerr EA. Comparison of quality of care for patients in the Veterans Health Administration and patients in a national sample. *Annals of Internal Medicine* 2004, Dec. 21; 141 (12):938 - 945
- Audet, AM, Michelle Doty, Jordon Peugh, Jamil Shamasdin, Kinga Zapert, and Stephen Schoenbaum. “Information Technologies: When Will They Make It Into Physicians’ Black Bags?” *Medscape General Medicine*, Dec. 7, 2004.
- T Bodenheimer T, MC Wang, TG Rundall, SM Shortell, RR Gillies, N Oswald, L Casalino and JC Robinson. “What are the facilitators and barriers in physician organizations’ use of care management processes?” *Jt Comm J Qual Saf*. 2004, Sep. 30; (9):505-14.
- Casalino, L, KJ Devers, TK Lake, M Reed, and JJ Stoddard. “Benefits of and Barriers to Large Medical Group Practice in the United States.” *Archives of Internal Medicine*, 2003, Sep. 8; 163(16): 1958-1964. (More information about the Community Tracking Study can be found at: <http://www.bschange.com/index.cgi?data=01>).
- Casalino, L, R Gillies, SM Shortell, J Schmittiel, T Bodenheimer, JC Robinson, TG Rundall, N Oswald, H Schaufliker, MC Wang. “External Incentives, Information Technology, and Organized Processes to Improve Health Care Quality for Patients with Chronic Diseases.” *JAMA*, 2003, 289(4): 434-441.
- Chehab, EL, N Panicker, PR Alper, LC Baker, SR Wilson, TA Raffin. “The Impact of Practice Setting on Physician Perceptions of the Quality of Practice and Patient Care in the Managed Care Era.” *Archives of Internal Medicine*, 2001, 161(2): 202
- Chuang, KH, HS Luft, and RA Dudley. “The Clinical and Economic Performance of Prepaid Group Practice,” in *Toward a 21st Century Health System: The Contributions and Promise of Prepaid Group Practice*. AC Enthoven and LA Tollen, Editors, San Francisco: Jossey-Bass, 2004.



The Council of Accountable Physician Practices (CAPP), an affiliate of the American Medical Group Association (AMGA), is a joint undertaking by 34 member groups of the nation's largest and most prominent physician practices. CAPP's mission is to foster the development and recognition of the accountable physician group model as a step towards the transformation of the American health care system.

[www.amga/CAPP/](http://www.amga/CAPP/)  
510.891.5055

Committee on the Costs of Medical Care. Medical Care for the American People. Chicago, Ill: University of Chicago Press, 1932.

Enthoven, AC and LA Tollen, "Preface," in Toward a 21st Century Health System: The Contributions and Promise of Prepaid Group Practice. AC Enthoven and LA Tollen, Editors, San Francisco: Jossey-Bass, 2004.

Feachem, RGA, ND Sekhri, and KL White. "Getting More for Their Dollar: A Comparison of the NHS with California's Kaiser Permanente." *British Medical Journal*, 2002, 324, 135-141.

Grumbach, K, D Osmond, K Vranizan, D Jaffe and AB Bindman. "Primary Care Physicians' Experience of Financial Incentives in Managed-Care Systems." *New England Journal of Medicine*, 1998, 339(21), 1519.

Grumbach, K, C Dower, S Mutha, J Yoon, W Huen, D Keane, DR Rittenhouse, AB Bindman. "California Physicians 2002: Practice and Perceptions." California Workforce Initiative at the UCSF Center for Health Professions, San Francisco, December 2002.

Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century, Washington, DC: National Academy Press, 2001.

Li, R, J Simon, T Bodenheimer, RR Gillies, L Casalino, J Schmittiel and SM Shortell. "Organizational factors affecting the adoption of diabetes care management processes in physician organizations." *Diabetes Care*. 2004, Oct;27(10):2312-6.

McMenamin, S, J Schmittiel, HA Halpin, R Gillies, TG Rundall, and SM Shortell. "Health Promotion in Physician Organizations: Results from a National Study." *American Journal of Preventive Medicine*, 2004, 26(4): 259-264.

Miller, RH and HS Luft. "HMO Plan Performance Update: An Analysis of the Literature, 1997-2001." *Health Affairs*, 2002, 21(4), 63-86.

National Business Group on Health, "Time to Reconsider Organized Systems of Care." *Issue Brief*, Institute on Health Care Costs and Solutions, March/April 2004, 3(2).

Parkerton, PH, DG Smith, and HL Straley. "Primary care practice coordination versus physician continuity." *Family Medicine*, 2004, 36(1): 15-21.

Rittenhouse, DR, K Grumbach, EH O'Neil, C Dower, and A Bindman. "Physician organization and care management in California: from cottage to Kaiser." *Health Affairs*, November/December 2004, 23(6): 51-62.

Rundall, TG, SM Shortell, MC Wang, L Casalino, T Bodenheimer, RR Gillies, JA Schmittiel, N Oswald, JC Robinson. "As good as it gets? Chronic care management in nine leading US physician organisations." *British Medical Journal*, 2002, 325, 958-961.

Solberg LI, O'Connor PJ, Christianson JB, Whitebird RR, Rush WA, Amundson GM. "The QUEST for quality: what are medical groups doing about it?" *Jt. Comm J Quality Patient Safety*, 2005, Apr; 31(4):211-9.

Schmittiel, J, SB McMenamin, HA Halpin, RR Gillies, T Bodenheimer, SM Shortell, T Rundall, LP Casalino. "The use of patient and physician reminders for preventive services: results from a National Study of Physician Organizations." *Prev Med*. 2004, Nov; 39(5):1000-6.

Shortell, S, and J. Schmittiel. "Prepaid Groups and Organized Delivery Systems: Promise, Performance, and Potential," in Toward a 21st Century Health System: The Contributions and Promise of Prepaid Group Practice. AC Enthoven and LA Tollen, Editors, San Francisco: Jossey-Bass, 2004.

## Endnotes

<sup>1</sup> Institute of Medicine, *Crossing the Quality Chasm: A New Health System for the 21st Century* (Washington, DC: National Academy Press, 2001), pages 1 and 4.