# Practice Systems for Chronic Care: Frequency and Dependence on an Electronic Medical Record

*Leif I. Solberg, MD; Sarah Hudson Scholle, DrPH; Stephen E. Asche, MA; Sarah C. Shih, MPH; L. Gregory Pawlson, MD, MPH; Merry Jo Thoele, MPH; and Amy L. R. Murphy, MHHA*

**Objectives:** To document the presence and functioning of different practice systems in a small sample of medical groups in Minnesota and to examine the relationship between the presence of practice systems and prior adoption of an electronic medical record (EMR).

**Study Design:** Descriptive study of the frequency of practice systems in 11 medical groups.

**Methods:** We recruited 11 medical groups for the study. Four groups had an EMR; the other groups used paper medical records, often supplemented by electronic ordering or data systems. Using an on-site audit team, we validated the presence of practice systems organized under 8 categories.

**Results:** All of the medical groups had implemented a substantial number of practice systems for care management of patients with chronic conditions. Although the medical groups with an EMR tended to have more comprehensive practice systems in place, the medical groups without an EMR also had most of the practice systems.

**Conclusions:** Although required in some functions, an EMR may not be necessary in facilitating practice systems that support consistent management of patients with chronic illness. Approaches are needed that will encourage the implementation of practice systems in medical groups with and without an EMR.

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T he need for major improvements in medical care in the United States has become clear since the release of important reports from the Institute of Medicine[1,2] and the publication of a study of the quality of national healthcare by McGlynn et al.[3] This need is particularly important in the care of patients with chronic disease, an area that will become even more critical as the population of older persons with these conditions increases.[4] As illustrated by the chronic care model (the dominant conceptual framework for effective care of chronic conditions), care delivery organizations of all sizes must implement practice systems to provide consistent and comprehensive care.[5,6] The term *practice systems* refers to organized processes designed to assure that certain information or services are collected or provided routinely to patients or to healthcare personnel (eg, reminders, test results, and education).

The problem is that few of these practice systems are in place, even in larger medical groups. Casalino et al[7] studied the presence of practice systems (termed *care management processes* [CMPs] by them) in 1040 physician organizations with 20 or more physicians, medical groups that should have the resources to implement such support for delivery of quality healthcare. Of a possible 16 CMPs, they found a mean of only 5 CMPs per medical group. Because the presence of external incentives and clinical information technology systems was strongly associated with CMP use, they suggested that providing these might increase the use of CMPs.

Other than that study[7] and other studies by Casalino et al, there is little information in the medical literature documenting the extent to which practice systems are present in medical groups. Moreover, the sparse information that is available about practice systems is neither detailed nor verified by on-site audits. As part of a study testing the validity of a new questionnaire method to measure the presence of practice systems for the care of patients with chronic disease, we documented detailed information about practice systems among 11 medical groups in Minnesota through self-assessment and on-site audits. In addition, we wanted to learn whether medical groups with an electronic medical record (EMR) were more likely to have such practice systems than medical groups without an EMR.

## METHODS

This study was conducted in Minnesota in collaboration with the Institute for Clinical Systems Improvement,

a quality improvement collaborative that includes most of the medical groups and hospitals in the state among its members. At the time of this study, those member organizations included about 75% of the physicians in Minnesota.[8] We obtained contact information from the Institute for Clinical Systems Improvement for 19 of their 38 medical group members who provide primary care to adults, specifying only that we wanted to recruit medical groups with a diversity of locations, sizes, and sophistication about quality improvement methods.

Recruitment was conducted by first sending a letter describing the study to the medical director (or equivalent) of each medical group, followed by telephone calls from one of us (LIS) until each medical group had decided whether to participate. Three medical groups declined participation (each on the grounds of having too much activity or turmoil at the time), and 2 medical groups agreed too late to be included. Three medical groups participated in pretesting the survey and the on-site audit, leaving 11 medical groups with complete information for this report.

This article is based on information gathered in on-site audits conducted by 2 trained and experienced nurse auditors. The auditors met with each participating medical group's quality improvement director and other staff for assessment of information about which they had particular knowledge. The on-site audit covered the following 8 practice systems and their component processes: (1) continuity of care (a system to maintain an ongoing and effective relationship between an individual clinician and a group of healthcare practitioners involved in providing care for a given patient), (2) registry (an organized system that allows the office or clinic to group patients by diagnoses and other parameters and uses the groupings to assist in the provision of care), (3) clinical information (systems and processes associated with a database of key patient and patient population information that can help manage patient care), (4) systematic monitoring (the use of a database to monitor key indicators of chronically ill patients' medical conditions for information that may require immediate attention), (5) clinician reminders (special communications intended to help the office or clinic team adhere to best practices related to the care of the individual patient), (6) performance tracking and feedback (the process of using clinical information systems to aggregate key indicators culled from a patient registry or other data source for the purposes of benchmarking performance and directing improvement activities), (7) clinical quality evaluation and improvement (a formal process to assess care, develop interventions, and use data to monitor the effects), and (8) care management (a set of specifically defined services for managing patients with chronic illness involving multiple practitioners and care between office visits).

The 8 practice systems and their components had been previously identified by an expert advisory panel convened by the National Committee for Quality Assurance to create the Practice Systems Assessment Survey (http://www.ncqa.org/Programs/RADD/researchreports.htm). This advisory panel was formed to identify the practice systems and components important for implementing the chronic care model framework. For each of the 8 practice systems selected by the National Committee for Quality Assurance panel, the on-site auditors in the present study reviewed evidence that the practice system and its components were present and usable. At the end of the on-site audit, the auditors completed an assessment of how well and consistently each practice system that was present was being used. An investigator or data collection supervisor (SCS) accompanied the auditors to most of the site visits to monitor them, and several debriefing sessions were conducted with the entire investigator group to clarify and verify the information and its collection process. After the on-site audit information was entered into an electronic database and the data were cleaned, item frequencies were organized by medical group for the analysis herein. This study was approved and monitored by the HealthPartners Institutional Review Board.

## RESULTS

Descriptive information about the participating medical groups is given in **Table 1.** In this and subsequent tables, data from the 7 medical groups without an EMR are contrasted with data from the 4 medical groups with an EMR. One of the 4 medical groups had an EMR that comprised all of the functions tested in the on-site audit; the other 3 supplemented their EMR with separate ordering or data systems. Six of the 7 medical groups with paper medical records managed some information with separate electronic systems. Examples of such systems are registries created from electronic billing systems, electronic reporting systems in in-house laboratories, and electronic appointment systems with the ability to include specific reminders.

**Table 2** gives information about the presence of practice systems as demonstrated in the on-site audit, with the auditors' subjective assessment of how consistently the practice systems were being used. Although almost all of the 11 medical groups had at least some component of each practice system present, the auditors found that some practice systems were not consistently used, with

the medical groups with an EMR being more likely to consistently use existing practice systems. Overall, the practice system that was least likely to be present was registry of patients with chronic conditions, and this was most lacking in the medical groups without an EMR. Based on the auditors' assessments, some of the 7 medical groups without an EMR did not use systematic monitoring or clinician reminders consistently even though they had a non–EMR method to do so.

Three items related to the practice system of continuity of care were assessed. Because all 11 medical groups had evidence of each of those components, findings for this practice system are not given in a table. Each medical group demonstrated that it had identified a personal clinician for each patient, had a process to assure that most patient visits were with that clinician, and had formal primary care teams to facilitate access and follow-up, with expanded roles for nurses or other team members.

Tables 3, 4, 5, 6, 7, and 8 summarize the extent to which the other 6 practice systems were present in the 11 medical groups. These tables give the number of medical groups having the components of the practice system summarized in each table. Most components of each practice system were present in all of the 11 med-

ical groups. Although the 4 medical groups with an EMR were somewhat more likely to have all of the practice system components, the 7 medical groups without an EMR had other ways to perform the functions of the practice systems. In particular, there is little difference among the 11 medical groups in the

**Table 1.** Characteristics of the Participating Medical Groups*

| Characteristic | Groups Without an EMR (n = 7)† | Groups With an EMR (n = 4)‡ |
|---|---|---|
| Adult primary care physicians | 8.6 (1-33) | 8.8 (1-18) |
| Nurse practitioners | 42.0 (6-82) | 58.0 (16-169) |
| Physicians' assistants | 7.3 (0-14) | 5.8 (2-10) |
| Registered nurses | 43.7 (3-217) | 82.8 (2-264) |
| Medicare patients, % | 16.0 (4-36) | 22.5 (13-34) |
| Medicaid patients, % | 8.9 (4-17) | 8.2 (5-16) |
| Uninsured patients, % | 4.1 (0-12) | 3.3 (2-5)§ |

*Data are given as mean number (range) unless otherwise indicated. EMR indicates electronic medical record.
†The 7 medical groups without an EMR were located in metropolitan areas (2 groups), cities of 50 000 to 100 000 inhabitants (2 groups), and towns of 10 000 to 20 000 inhabitants (3 groups). Owners of the medical groups were hospital systems (4 groups) and physicians (3 groups).
‡The 4 medical groups with an EMR were located in a metropolitan area (1 group), a city of 50 000 to 100 000 inhabitants (1 group), and towns of 10 000 to 20 000 inhabitants (2 groups). Owners of the medical groups were hospital systems (4 groups) and physicians (2 groups).
§Information missing from 1 medical group.

**Table 2.** Overall Presence and Consistent Use of the 8 Practice Systems

| Practice System | Groups Without an EMR (n = 7) | | Groups With an EMR (n = 4) | |
|---|---|---|---|---|
| | Present | Consistently Used | Present | Consistently Used |
| Continuity of care | 7 | 7 | 4 | 4 |
| Clinical information | 7 | 7 | 4 | 4 |
| Performance tracking and feedback | 7 | 6 | 4 | 4 |
| Clinical quality evaluation and improvement | 7 | 7 | 4 | 4 |
| Care management | 7 | 4 | 4 | 3 |
| Systematic monitoring | 6 | 1 | 4 | 3 |
| Clinician reminders | 6 | 2 | 4 | 3 |
| Registry | 3 | 2 | 4 | 3 |
| Overall % of the 8 practice systems | 89 | 64 | 100 | 88 |

EMR indicates electronic medical record. Consistent use represented the auditors' assessment of whether the practice system was used very much or moderately vs somewhat or not at all.

**Table 3.** Presence of the Clinical Information Practice System

| Component | Total, No. (%) | Groups Without an EMR, % | Groups With an EMR, % |
|---|---|---|---|
| Clinical guidelines in the patient care area | 11 (100) | 100 | 100 |
| Problem list | 10 (91) | 86 | 100 |
| Medication list | 9 (82) | 71 | 100 |
| Checklists for prevention and monitoring | 8 (73) | 71 | 75 |
| Alerts on abnormal test results | 8 (73) | 71 | 75 |
| *Alerts on drug–drug interactions* | 7 (64) | 43 | 100 |
| *Ability to search for patients by diagnosis* | 7 (64) | 43 | 100 |
| Information about medications | 5 (45) | 43 | 50 |
| *Status summary of preventive services* | 4 (36) | 14 | 75 |
| *Ability to search for patients taking a medication* | 4 (36) | 14 | 75 |
| *Behavioral risk factors* | 3 (27) | 14 | 50 |
| Flow sheets | 1 (9) | 14 | 0 |
| *Registry for patients with chronic conditions* | | | |
|     Asthma | 1 (9) | 14 | 0 |
|     Cardiovascular disease | 3 (27) | 14 | 50 |
|     Depression | 2 (18) | 14 | 25 |
|     Diabetes mellitus | 7 (64) | 43 | 100 |
| Mean No. of the 13 components | 7.6 | 6.3 | 10.0 |
| Overall % of the 13 components | 59 | 48 | 77 |

EMR indicates electronic medical record. Italics indicate that the medical groups with an EMR were more than twice as likely as the medical groups without an EMR to have that component.

presence of most components of the performance tracking and feedback practice system and no difference among the 11 medical groups in the presence of all components of the clinical quality evaluation and improvement practice system. To clarify this, we italicized each table component in which the medical groups with an EMR were more than twice as likely as the medical groups without an EMR to have that component. Most italicized components are found in Table 3, which addresses the clinical information practice system.

## DISCUSSION

Our findings demonstrate that the 11 medical groups studied had a high number of the practice systems that are believed to be important for providing effective care for patients with chronic conditions. They also had most of the detailed components of those practice systems. Although the medical groups with an EMR had more practice systems and components present, the medical groups relying on paper medical records had other ways to implement most of the components of the practice

systems. Only 13 of 60 total components in the practice systems were more than twice as likely to be present in the medical groups with an EMR, suggesting that an EMR is necessary for or enhances these capabilities. As expected, those components were largely related to information technology, such as reminders, registries, and data about individual clinicians.

Few studies have documented any aspect of the presence of practice systems among medical groups. After postulating the chronic care model,[6] Wagner et al[9] studied 72 leading chronic disease programs. They found that only 1 program included all 6 elements of the chronic care model framework, and only 5 other programs included 5 of 6 elements. Solberg et al[10,11] assessed the importance of practice systems in delivering preventive services and reported in the mid 1990s that practice systems were infrequent findings among 44 medical practices in Minnesota.

In 2003, Casalino et al[7] reported that, among 1040 physician organizations (with ≥ 20 physicians) responding to a survey about the extent to which physician organizations use CMPs, 50% had 4 or fewer of a possible 16 CMPs for chronic disease care (similar to the

**Table 4.** Presence of the Systematic Monitoring Practice System

| Component | Total, No. (%) | Groups Without EMR, % | Groups With an EMR, % |
|---|---|---|---|
| Tracking laboratory test results and radiology reports | 9 (82) | 86 | 75 |
| *Tests needed for monitoring a chronic condition* | 7 (64) | 43 | 100 |
| *Patients due for preventive services* | 6 (55) | 29 | 100 |
| Patients due for follow-up visits | 6 (55) | 43 | 75 |
| Patients with missed appointments | 4 (36) | 29 | 50 |
| Tracking consultation reports | 2 (18) | 14 | 25 |
| Patients due for medication renewals | 0 | 0 | 0 |
| Mean No. of the 7 components | 3.1 | 2.4 | 4.3 |
| Overall % of the 7 components | 44 | 35 | 61 |

EMR indicates electronic medical record. Italics indicate that the medical groups with an EMR were more than twice as likely as the medical groups without an EMR to have that component.

practice systems described in this study), and only 22% had more than 8 CMPs. A subsequent investigation by Li et al[12] studied the presence of 4 CMPs (registry, guidelines, case management, and physician feedback) among 987 medical groups that provided care for patients with diabetes mellitus. They found that 48% had 0 to 1, 20% had 2, and 32% had 3 to 4 of these CMPs. The characteristics associated with the presence of these CMPs were external incentives, a computerized information system, and ownership by a hospital or a health maintenance organization. Results of other interview studies[13,14] among leading healthcare delivery systems suggest that the main barriers to successful implementation of CMPs are inadequate resources or information systems, physician busyness or resistance, and lack of an effective means for reimbursement.

The main facilitators were strong leadership, an organizational culture valuing quality of care, the presence of electronic information systems, and supportive health plans.

There seems to be widespread perception on the part of policy makers that an EMR is the principal or even the only change required for closing the quality of care gaps identified by the Institute of Medicine.[1,2] There is little clear evidence on this important issue, but clearly an EMR is not the sine qua non of efficacy. The Veterans Health Administration has made remarkable strides in improving its quality of care, with Asch et al[15] documenting 10% to 20% better performance by the Veterans Health Administration in chronic disease care and preventive care (but not acute care) compared with care delivered by a national sample of providers. Although its

**Table 5.** Presence of the Clinician Reminders Practice System

| Component | Total, No. (%) | Groups Without an EMR, % | Groups With an EMR, % |
|---|---|---|---|
| Alerts on preventive services needed | 8 (73) | 71 | 75 |
| Alerts on tests needed for monitoring conditions | 8 (73) | 71 | 75 |
| Alerts on abnormal test results | 8 (73) | 57 | 100 |
| *Alerts on drug–drug interactions* | 6 (55) | 29 | 100 |
| Alerts on disease–drug interactions | 2 (18) | 29 | 0 |
| Mean No. of the 5 components | 2.9 | 2.6 | 3.5 |
| Overall % of the 5 components | 62 | 51 | 70 |

EMR indicates electronic medical record. Italics indicate that the medical groups with an EMR were more than twice as likely as the medical groups without an EMR to have that component.

**Table 6.** Presence of the Performance Tracking and Feedback Practice System

| Component | Total, No. (%) | Groups Without an EMR, % | Groups With an EMR, % |
|---|---|---|---|
| Tracking done for technical care and service | 11 (100) | 100 | 100 |
| Used to monitor adherence to guidelines | 11 (100) | 100 | 100 |
| Used to identify clinician education needs | 11 (100) | 100 | 100 |
| Used for quality improvement studies | 11 (100) | 100 | 100 |
| Used to benchmark against other clinics | 11 (100) | 100 | 100 |
| Feedback on overall office performance | 11 (100) | 100 | 100 |
| Feedback on individual clinician medical care | 10 (91) | 86 | 100 |
| *Feedback to individual clinicians on patient satisfaction* | 7 (64) | 43 | 100 |
| *Feedback to individual clinicians on service data* | 6 (55) | 29 | 100 |
| Used for clinician financial incentives or bonuses | 5 (45) | 57 | 25 |
| Mean No. of the 10 components | 8.5 | 8.1 | 9.3 |
| Overall % of the 10 components | 85 | 81 | 92 |

EMR indicates electronic medical record. Italics indicate that the medical groups with an EMR were more than twice as likely as the medical groups without an EMR to have that component.

integrated electronic information system was credited for some of this improvement, the Veterans Health Administration has implemented other quality improvement and comparative performance reporting activities as well. In a randomized trial of electronic information system implementation of cardiac care guidelines targeting primary care physicians and pharmacists in Indiana, Tierney et al[16] found no effect of cardiac care guidelines generated by an EMR on physicians' adherence to evidence-based guidelines and suggested that methods of affecting clinician behavior other than an EMR were needed.

Before the value of an EMR in improving healthcare delivery can be thoroughly tested, the types of practice

**Table 7.** Presence of the Clinical Quality Evaluation and Improvement Practice System

| Component | Total, No. (%) | Groups Without an EMR, % | Groups With an EMR, % |
|---|---|---|---|
| No. of quality improvement activities in the past 12 mo for | | | |
|     Clinical processes | 11 (100) | 100 | 100 |
|     Clinical outcomes | 11 (100) | 100 | 100 |
|     Patient satisfaction | 10 (91) | 86 | 100 |
|     Service efficiency | 9 (82) | 86 | 75 |
|     Patient safety | 8 (73) | 71 | 75 |
| Measure to identify opportunities for improvement | 11 (100) | 100 | 100 |
| Use of a written performance goal for an intervention | 11 (100) | 100 | 100 |
| Performance data collected systematically before and after the quality improvement intervention | 10 (91) | 86 | 100 |
| Mean No. of the 8 components | 7.4 | 7.3 | 7.5 |
| Overall % of the 8 components | 92 | 91 | 94 |

EMR indicates electronic medical record.

**Table 8.** Presence of the Care Management Practice System

| Component | Total Groups, No. (%) | Groups Without an EMR, % | Groups With an EMR, % |
|---|---|---|---|
| Previsit planning | 11 (100) | 100 | 100 |
| Protocol-based referrals for self-management support | 8 (73) | 71 | 75 |
| After-visit follow-up | 6 (54) | 43 | 75 |
| Routine use of | | | |
|   Reporting test results to patients | 11 (100) | 100 | 100 |
|   Patient reminders of visit or test needs | 8 (73) | 71 | 75 |
|   *Educational classes* | 7 (64) | 43 | 100 |
|   Automatic reminders to provide patients with educational materials | 3 (27) | 29 | 25 |
|   Group visits for similar patients | 6 (54) | 43 | 75 |
|   Patient support groups | 5 (45) | 29 | 75 |
| Patients with chronic conditions screened for | | | |
|   Tobacco use | 11 (100) | 100 | 100 |
|   Alcohol or other drug use | 9 (82) | 86 | 75 |
|   Obesity or weight management | 7 (64) | 57 | 75 |
| Referrals for risk factor management for | | | |
|   Smoking cessation programs | 8 (73) | 57 | 100 |
|   Weight loss programs | 7 (64) | 57 | 75 |
|   Substance abuse programs | 6 (54) | 43 | 75 |
|   *Patient support groups* | 6 (54) | 43 | 75 |
|   Exercise programs | 4 (36) | 43 | 25 |
| Mean No. of the 17 components | 11.2 | 10.1 | 13.0 |
| Overall % of the 17 components | 69 | 63 | 79 |

EMR indicates electronic medical record. Italics indicate that the medical groups with an EMR were more than twice as likely as the medical groups without an EMR to have that component.

systems that are primarily or exclusively driven by EMR adoption need to be characterized in detail. The present study takes a first step toward that goal. Because the 11 medical groups described herein appeared to be able to implement almost as many practice system components without an EMR as with an EMR, the stage is set for comparison trials of the effectiveness of different approaches to information systems and of various types of practice systems.

Although the present study is valuable in documenting in detail for the first time, to our knowledge, the presence of a variety of practice systems in a sample of medical groups, it has significant limitations for generalization of the results. The number of medical groups studied was small, and although we recruited a diverse sample, the medical groups were all large, with more

midlevel practitioners and registered nurses (Table 1) than most primary care practices in the United States, where only 18% of physicians work in groups of 10 or more.[7] Also, the medical groups described herein were all members of a sophisticated quality improvement collaborative (the Institute for Clinical Systems Improvement) that focuses on encouraging the development and effective use of practice systems, although half the medical groups were new to that membership. Whether increased use of practice systems is driving quality improvement or, conversely, participation in quality improvement is driving the adoption of practice systems (or some other factor is driving both) is a fertile area for further inquiry. Despite these limitations, this study demonstrates that private medical groups, including those without an EMR, can organize their

practices for systematic care of persons with chronic conditions.

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## REFERENCES

1. **Institute of Medicine.** *To Err Is Human: Building a Safer Health System.* Washington, DC: National Academy Press; 1999.

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

3. **McGlynn EA, Asch SM, Adams J, et al.** The quality of health care delivered to adults in the United States. *N Engl J Med.* 2003;348:2635-2645.

4. **Institute of Medicine Committee on Identifying Priority Areas for Quality Improvement.** *Priority Areas for National Action: Transforming Health Care Quality.* Washington, DC: National Academy Press; 2003.

5. **Wagner EH, Austin BT, Davis C, Hindmarsh M, Schaefer J, Bonomi A.** Improving chronic illness care: translating evidence into action. *Health Aff (Millwood).* 2001;20(6):64-78.

6. **Wagner EH.** Chronic disease management: what will it take to improve care for chronic illness? *Eff Clin Pract.* 1998;1:2-4.

7. **Casalino L, Gillies RR, Shortell SM, et al.** External incentives, information technology, and organized processes to improve health care quality for patients with chronic diseases. *JAMA.* 2003;289:434-441.

8. **Farley DO, Haims MC, Keyser DJ, Olmsted SS, Curry SV, Sorbero M.** Regional health quality improvement coalitions: lessons across the life cycle. Santa Monica, Calif: RAND Health; 2003:70.

9. **Wagner EH, Davis C, Schaefer J, Von Korff M, Austin BT.** A survey of leading chronic disease management programs: are they consistent with the literature? *Manag Care Q.* 1999;7:56-66.

10. **Solberg LI, Kottke TE, Conn SA, Brekke ML, Calomeni CA, Conboy KS.** Delivering clinical preventive services is a systems problem. *Ann Behav Med.* 1997;19:271-278.

11. **Solberg LI, Kottke TE, Brekke ML, Conn SA, Magnan S, Amundson G.** The case of the missing clinical preventive services systems. *Eff Clin Pract.* 1998;1: 33-38.

12. **Li R, Simon J, Bodenheimer T, et al.** Organizational factors affecting the adoption of diabetes care management processes in physician organizations. *Diabetes Care.* 2004;27:2312-2316.

13. **Rundall TG, Shortell SM, Wang MC, et al.** As good as it gets? chronic care management in nine leading US physician organisations. *BMJ.* 2002;325:958-961.

14. **Bodenheimer T, Wang MC, Rundall TG, et al.** What are the facilitators and barriers in physician organizations' use of care management processes? *Jt Comm J Qual Saf.* 2004;30:505-514.

15. **Asch SM, McGlynn EA, Hogan MM, et al.** Comparison of quality of care for patients in the Veterans Health Administration and patients in a national sample. *Ann Intern Med.* 2004;141:938-945.

16. **Tierney WM, Overhage JM, Murray MD, et al.** Effects of computerized guidelines for managing heart disease in primary care. *J Gen Intern Med.* 2003;18: 967-976.