

Effects of an HMO Hospitalist Program on Inpatient Utilization

Carol Molinari, PhD; and Robert Short, PhD

Objective: To assess the impact of a health maintenance organization (HMO) hospitalist program on inpatient utilization.

Patients: The study sample consisted of patients admitted to the hospital for a routine, uncomplicated acute surgical or medical diagnosis included under Milliman and Robertson's Optimal Recovery Guidelines (ORGs). Evaluation involved comparison of 2 physician management groups: inpatients managed by staff primary care physicians (PCPs) (study group) and inpatients managed by network PCPs (comparison group).

Study Design: Data before and after introduction of the hospitalist program were available. From the same period, data were available from patients of network PCPs who managed their own inpatient stays (nonhospitalist comparison sample). Three outcomes were used to represent inpatient utilization: (1) number of inpatient stays meeting ORG goals; (2) number of inpatient stays not meeting ORG goals that had ≥ 1 medically necessary days; and (3) number of inpatient stays not meeting ORG goals that had ≥ 1 medically unnecessary days.

Results: Multiple logistic regression results indicated that inpatient stays were more likely to be within ORG utilization goals when managed by hospitalists vs nonhospitalists ($P < .05$). Introduction of the hospitalist program reduced the number of stays with unnecessary days among staff inpatients. There was an increase in stays with unnecessary days in the comparison group, ie, inpatients managed by network physicians.

Conclusions: Full-time hospitalists are efficient managers of HMO inpatients. The ORGs for acute, uncomplicated diagnoses provided useful hospital utilization measures that captured inpatient management by hospitalists and PCPs.

(*Am J Manag Care* 2001;7:1051-1057)

In the quest for increasing efficiency in the American healthcare delivery system, health providers and delivery systems are searching for new ways to lower costs and enhance value. One health maintenance organization (HMO) in the northwestern United States recently adopted a hospitalist model to deliver inpatient care to its members to better manage hospital costs. The purpose of this evaluation was to assess whether inpatient utilization declined after implementation of the HMO hospitalist program.

Unlike other developments in American medicine that stem from science and technology, the hospitalist movement is emerging from market demands for greater economical use of resources in the provision of quality and accountable healthcare.¹ Coined as "hospitalists" by Robert Wachter,² inpatient specialists are responsible for managing the care of hospitalized patients. The hospitalist concept is not new. Inpatient specialists have practiced in urban hospitals in Canada and England for the past 2 decades.¹ The hospitalist model has recently been embraced across the United States, resulting in 2000 to 3000 hospitalists currently in practice.^{3,4}

In essence, the hospitalist model works as follows: when an individual is too ill to be treated as an out-

© Medical World Community From Eastern Washington State University, Cheney, WA (CM) and Washington, Institute for Mental Health Illness, Research and Training, Washington State University, Spokane, WA (RS).

This work was supported by the Health Policy and Administration Program, WSU-Spokane, and the Washington Institute for Mental Illness Research and Training, Spokane, WA.

Address correspondence to: Carol Molinari, PhD, Address correspondence to: Carol Molinari, PhD, Eastern Washington University, 220 Showalter, Cheney, WA 99004. E-mail: cmolinari@ewu.edu.

For editorial comment, see page 1101.

patient, the patient is admitted to the hospital and the primary care physician (PCP) transfers responsibility to the hospitalist, who manages the patient's care for an entire hospital stay. The hospitalist coordinates specialist consultations, oversees diagnostic needs, schedules procedures, and generally accelerates the patient's progress through the hospital. At discharge, the hospitalist returns care of the patient to the PCP. The hospitalist model differs from customary management by the patient's PCP by having a full-time physician present in the hospital to facilitate inpatient care compared with PCPs making brief hospital visits.

Many argue that hospitalists improve efficiency and quality of care. The presence of a physician in the hospital throughout the day who can coordinate inpatient care and react to clinical data in real time is a major strength.⁵ A hospitalist manages routine cases faster and with fewer delays and breaks in communication than a PCP, whose availability to the hospitalized patient is limited.⁶ The hospitalist's understanding of the hospital culture helps shepherd the ill patient through the hospital system efficiently, enhancing the timeliness of hospital care⁷ and maintaining satisfaction among patients.^{8,9} In one study,⁹ trickle-down effects of hospitalists included PCPs gaining 4 hours per week to spend with office patients.

There are also potential negative effects of a hospitalist program. The hospitalist does not have an established relationship with the patient and family and thus risks disrupting the continuity of care to the patient. Since the hospitalist coordinates inpatient care only, he or she becomes another provider in the delivery of hospital care. Some researchers¹⁰⁻¹² argue that by adding another physician in the chain of care, hospitalists separate inpatient and outpatient medicine, posing potential risks to patients. Although a hospitalist delivery model may be efficient on the inpatient side, such a model could further fragment healthcare delivery by isolating the hospitalized patient from a trusted and familiar provider. The hospitalist program usually means that the family has to consult with an unfamiliar physician when making critical decisions. Thus, for the patient, being hospitalized can be a terrible time to lose contact with the physician they have come to trust.¹³

By their full-time availability in the hospital, hospitalists are expected to reduce unnecessary hospital days and inappropriate ancillary services.¹⁴ Because more than half of working Americans are members of HMOs, it is reasonable to expect that

hospitalist programs are likely to be adopted. A key concept of managed delivery systems like HMOs is to produce better health outcomes while using resources efficiently.¹⁵ Therefore, the question remains whether hospitalist programs in managed delivery systems are helping improve efficiency and quality.

The literature consistently reports a reduction in inpatient utilization for hospitals that use hospitalist programs. A hospitalist program offered at Moffitt Long Hospital, an academic center in San Francisco, CA, was evaluated for cost, quality, and patient satisfaction.¹⁶ A 15% reduction in inpatient costs was reported, without any declines in clinical outcomes or patient satisfaction.¹⁶ A hospitalist program at a large urban community hospital reported a reduction of 1 day in the median length of stay (LOS), which resulted in significant cost savings.¹⁷ A hospitalist program in a rural medical center reported shorter mean LOSs and increased cost savings, without changes in patients managed by internists.¹⁸ In addition, this rural hospital-based hospitalist program reported better efficiencies and patient satisfaction for inpatients managed by hospitalists compared with inpatients managed by internists. Cost savings were most apparent for very ill patients.¹⁸

The literature on hospitalist programs in managed care delivery systems shows somewhat less consistent utilization reductions and cost savings compared with hospital-based hospitalist programs. In San Antonio, TX, where Humana used hospitalists for 4 years in the 1990s, there were reductions in bed days by 50% for Medicare patients and 33% for commercial patients.⁸ In 1997, 86% of Humana patients reported satisfaction with the hospitalist program.⁸ Similarly, the Park Nicollet Clinic in Minneapolis, MN, has been using a hospitalist program since 1995 and reported that average stays dropped by 0.64 days and that costs per stay decreased by 20% while patient satisfaction remained the same.¹⁹ At Park Nicollet Clinic, the hospitalist program also reduced inpatient costs for the 12 most expensive diagnosis-related groups by 25%.¹⁹ These cost savings did not lead to a decline in satisfaction by patients or physicians. Kaiser Permanente's Colorado region started a hospitalist program in 1994 that lowered the number of consultant physicians per inpatient by half.¹ However, the hospitalist program implemented at Kaiser Permanente's HMO in northern California did *not* find lower inpatient utilization and costs.²⁰

Even with the apparent gains in efficiency reported for hospitalist programs, it is imperative for deliv-

ery systems to assess the effects of hospitalist programs since they impact care to the most vulnerable patients. To measure changes in this evaluation, LOSs were assessed using a pre-post implementation design. Use of 1998 (prehospitalist) and 1999 (posthospitalist) inpatient data allowed assessment of utilization changes for HMO inpatients managed by hospitalists and nonhospitalists. Milliman and Robertson's Optimal Recovery Guidelines (ORGs) for surgical and medical hospital admission diagnoses were used to select the 2 groups of inpatients and to measure hospital utilization. By using the ORGs we minimized variation in patient acuity in this evaluation.

... METHODS ...

Setting

The HMO evaluated in this study used a mixed model of healthcare delivery that involved staff and network PCPs board certified in either family practice or internal medicine. Among the 25 board-certified staff PCPs, 22 (88%) were family practice physicians. Similarly, 51 (86%) of 59 network PCPs were family practice physicians.

In early 1998, the HMO governing board, because of a sharp rise in hospital utilization, implemented a hospitalist program. The expectation was that hospitalists would reduce unnecessary hospital days for HMO inpatients by closely monitoring and shepherding patients during their hospital stay. The hospitalist program was implemented only for inpatients whose PCPs were salaried staff physicians. In contrast, network PCPs, who contracted with the HMO to receive a capitated rate for each patient, continued to manage their inpatients throughout the study. Five staff PCPs (3 in family practice and 2 in internal medicine) became hospitalists in the fall of 1998. Hospitalists remained salaried HMO physicians. Other hospitalist programs reported by Lindenauer et al²¹ were staffed mostly by internists (89%).

The HMO hospitalist program was designed to have hospitalists admit and manage patients during the workweek and rotate to cover evenings and weekends. Hospitalists attended on general medical units and followed patients to the intensive care unit. The average daily census for hospitalists in 1999 was 11 patients per hospitalist, consistent with national survey results of hospitalist programs.^{3,21} The HMO employed nurse case managers before the hospitalist program began who managed all HMO patients (staff and network) admitted to the hospital.

There were *no* new disease management programs implemented in the HMO during the study.

Research Design and Patient Sample

A pre-post evaluation design was used to assess changes in hospital utilization for HMO staff and network patients. Patients 18 years or older admitted to the hospital for a routine, uncomplicated acute surgical or medical clinical diagnosis included under the ORGs were eligible for the study sample. Patients with ORG diagnoses represent about half of the total HMO inpatient admissions. Baseline measures included eligible inpatient ORG admissions during the first three quarters of 1998 (January-September). The hospitalist program began in October 1998. Postimplementation measures included data from January through September 1999.

The evaluation involved a comparison of hospital stays managed by 2 groups of physicians: inpatients managed by staff PCPs composed the study group and inpatients managed by network PCPs served as the comparison group. Physician management in the study group changed from staff PCPs in 1998 to hospitalists in 1999. Physicians managing the comparison inpatients remained unchanged from 1998 through 1999. Patients with obstetric, psychiatric, chemical dependency, and substance abuse diagnoses were not managed by hospitalists and therefore were excluded from this evaluation. All inpatients were admitted to a single regional medical center and were not seen or managed by medical students, interns, or residents.

Study Outcome Variables

To obtain measures of inpatient utilization, the patient's actual LOS was compared with an expected LOS according to the ORG for a particular acute medical or surgical diagnosis. Each diagnosis had an expected or optimal LOS based on clinical protocols. Common surgical and medical diagnoses, representing more than 50% of all diagnoses in the study, and their associated ORG goal days are listed in **Table 1**. When an actual LOS was less than or equal to the expected LOS, then the hospital stay was considered to attain the ORG goal. Days over goal were divided into medically necessary days (additional recovery days needed to reach clinical discharge criteria) and medically unnecessary days (days during which a patient could have been discharged on clinical grounds but was not). A critical care nurse using explicit criteria and taking into account patient medical risk and acuity level made the determina-

tion of medically necessary or unnecessary days. Three specific variables were analyzed: number of inpatient stays attaining ORG goals; number of inpatient stays with ≥ 1 medically necessary days over

goal; and number of inpatient stays with ≥ 1 medically unnecessary days over goal.

Statistical Analysis

To determine which study variables influenced the dependent or outcome variables (attainment of goal, medically necessary days, and medically unnecessary days), patient age, physician group, and year of hospital admission were entered into multiple logistic regression modeling procedures. Also included in the logistic model was the year x physician group interaction, which was tested to determine whether switching to the hospitalist program in the second year altered utilization relative to the comparison group of network physicians. Patient age was entered into the model as a covariate likely to influence the 3 outcomes and was dichotomized into 18 to 64 years and ≥ 65 years. An odds ratio and probability estimate was computed in the multiple logistic procedure for the independent variables for each of the 3 dependent variables.

Table 1. Most Common Surgical and Medical Hospital Admission Diagnoses and Their Associated Optimal Recovery Guidelines, 1998 and 1999

Diagnoses	Expected Length of Stay, d
Surgical	
Hysterectomy, abdominal	2
Knee replacement: arthroplasty (total)	3
Lumbar discectomy, foraminotomy, laminotomy, multiple levels, or reexploration	1
Hip replacement: arthroplasty (total)	3
Coronary artery bypass graft	3
Cervical fusion, anterior	1
Hysterectomy, vaginal	1
Medical	
Myocardial infarction, acute, with or without reperfusion	4
Angina, unstable	1
Pneumonia, community acquired	2
Chronic obstructive pulmonary disease	2
Thrombosis, deep leg vein	4

... RESULTS ...

There were 903 staff/hospitalist inpatients in the study group (ie, inpatients treated by HMO staff PCPs) and 416 network inpatients in the comparison group (Table 2). Among the 903 staff/hospitalist inpatients, the number of hospital admissions was split equally between 1998 and 1999, whereas 258 (62%) of the 416 network inpatients were admitted to the hospital in 1999 compared with 158 (38%) in 1998. The elderly (≥ 65 years) composed 499 (38%) of the 1319 total inpatients. Of the staff/hospitalist inpatients, the proportion of elderly was 42%—significantly more than the 29% for network elderly inpatients (data not shown). For 1998 and 1999 taken together, 537 (41%) of 1319 inpatient stays attained ORG goals. Among the 782 patient stays not attaining ORG goals, 668 (85%) had medically necessary days that accounted for the extra day(s) over ORG goal, 182 (23%) had medically unnecessary days, and 68 (9%) had both.

The logistic regression results (Table 3) for ORG goal attainment indicated that inpatient stays managed by staff physicians were significantly more likely to attain ORG goals than were stays managed by network physicians. Specifically, inpatient stays managed by staff physicians were 1.7 times more like-

Table 2. Descriptive Statistics*

	Inpatients, No. (%)		
	1998 (n = 614)	1999 (n = 705)	Total (N = 1319)
Inpatient group			
Staff/hospitalist	456 (50)	447 (50)	903
Network	158 (38)	258 (62)	416
Age, y			
18-64	357 (44)	463 (56)	820
≥ 65	257 (52)	242 (48)	499
Outcome			
Attain ORG goals	236 (44)	301 (56)	537
Medically necessary days over ORG goal	320 (48)	348 (52)	668
Medically unnecessary days over ORG goal	91 (50)	91 (50)	182

*ORG = Optimal Recovery Guideline.

ly to attain ORG goals than were stays managed by the comparison group of network PCPs. There was also a significant interaction between physician group and year of hospitalization, indicating a significant impact of implementing the hospitalist program as manifested by a greater number and proportion of inpatient stays that attained ORG goals (Figure 1). The interaction yielded an odds ratio of 1.7 (ie, the inverse of 0.61).

Examining inpatient stays over ORG goal with medically necessary days, the logistic regression results showed that the hospitalist program did not significantly influence the number of stays (Table 3). Inpatient stays over ORG goal with medically necessary days (Figure 2) indicated a nonsignificant divergence between the 2 HMO patient groups during the 2 years. This result suggests that medical necessity was not a likely contributor to the significant effect of goal attainment among inpatient stays managed by hospitalists (Figure 1).

The logistic regression results for inpatient stays over goal with medically unnecessary days indicated that staff inpatients were significantly more likely than network inpatients to have hospital stays over goal with medically unnecessary days (Table 3). The significant interaction of physician group x year indicates that staff inpatients in 1998 were more likely to have hospital stays with medically unnecessary days than hospitalists in 1999. In contrast, network inpatients were more likely to have stays with medically unnecessary days in 1999 than in 1998 (Figure 3).

Age was a significant covariate for ORG goal attainment. Inpatients aged 18 to 64 years were 1.5

times more likely to be in line with ORG goals than were patients aged ≥ 65 years (Table 3). Because age was a significant factor, patterns of goal attainment by staff and year were examined for each age separately. The same general pattern was evident in each age group. Age was not, however, significantly related to medically necessary and unnecessary days over goal (Table 3).

... DISCUSSION ...

The regression results indicate that inpatient stays managed by hospitalists were more likely to attain ORG utilization goals than were network inpatient stays. Although there was a greater proportion of medically unnecessary stays managed by staff/hospitalist PCPs compared with stays managed by network PCPs, introduction of the hospitalist program significantly reduced unnecessary days, thereby improving efficiency.

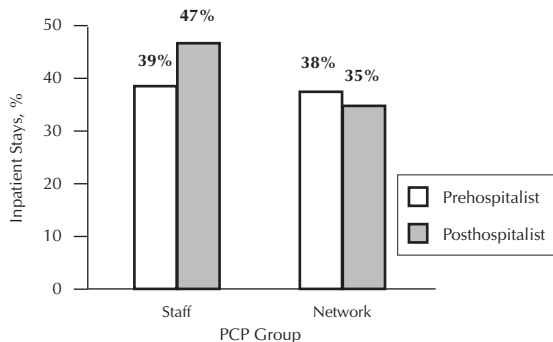
Two patient variables were examined to assess patient comparability between those managed by hospitalists and nonhospitalists, namely, average patient age and hospital utilization assessed as actual LOS less medically unnecessary days. The average age of staff inpatients was 59 years and of network inpatients was 54 years. The amount of medically necessary utilization for staff and network inpatients was 2.7 days and 2.6 days, respectively. These data lend support to the 2 groups likely being equally ill and therefore not influencing the results observed. Given the significantly higher proportion of elderly staff inpatients, the higher goal

Table 3. Logistic Regression Results for Utilization Outcomes*

Independent Variables	ORG Goal Attainment (n = 1319)		Medically Necessary Days Over ORG Goal (n = 668)		Medically Unnecessary Days Over ORG Goal (n = 182)	
	Odds Ratio (95% CI)	P	Odds Ratio (95% CI)	P	Odds Ratio (95% CI)	P
Patient type (staff vs network)	1.74 (1.27-2.40)	<.001	0.66 (0.95-2.42)	<.10	1.64 (1.10-2.44)	<.05
Year (1998 vs 1999)	1.18 (0.78-1.78)	NS	0.98 (0.64-1.63)	NS	1.21 (0.81-1.81)	NS
Patient age (18-64 y vs ≥ 65 y)	1.52 (1.21-1.92)	<.001	1.16 (0.77-1.75)	NS	0.94 (0.67-1.33)	NS
Patient type x year interaction	0.61 (0.37-1.00)	<.05	1.50 (0.59-3.79)	NS	4.30 (1.05-5.15)	<.05

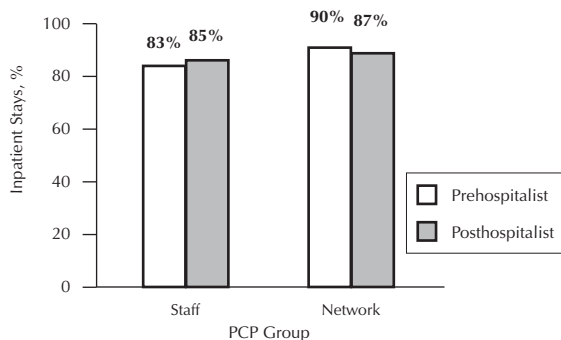
*ORG = Optimal Recovery Guideline; CI = confidence interval.

Figure 1. Inpatient Stays Attaining Optimal Recovery Guideline Goals



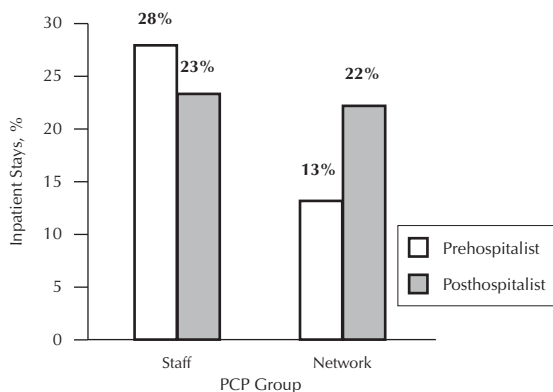
PCP = primary care physician.

Figure 2. Inpatient Stays Over Optimal Recovery Guideline Goals with Medically Necessary Days



PCP = primary care physician.

Figure 3. Inpatient Stays Over Optimal Recovery Guideline Goals with Medically Unnecessary Days



PCP = primary care physician.

attainment among hospitalists cannot be attributed to patient age.

Because hospitalists were managing staff inpatient stays in 1999, the improvement in ORG goal attainment compared with 1998 suggests that hospitalists were managing routine hospital stays more efficiently and in closer accordance with the established protocols than were network PCPs. The routine, less complicated cases tracked by the ORGs seem to provide inpatient utilization data useful for monitoring physician management of inpatients. The lower goal attainment coupled with the lower proportion of medically necessary days and higher proportion of medically unnecessary days for network inpatients from 1998 and 1999 suggest that their longer stays are likely not due to medical necessity.

The results for stays over goal suggest that hospitalists are more efficiently managing inpatient stays and thus lowering utilization. These findings are consistent with shorter LOSs found among Humana patients in Texas,⁸ Park Nicollet Clinic patients in Minnesota,⁹ and Kaiser Permanente patients in northern California.²⁰ In addition, inpatient stays managed by hospitalists had significantly fewer medically unnecessary days. This supports the claim that hospitalists can reduce unnecessary utilization.¹⁴ Overall, the ORGs for acute, uncomplicated cases provided hospital utilization measures that were useful in capturing inpatient management information for the PCPs and hospitalists.

Some potential strategies to help physicians improve inpatient management include systematic and regular use of utilization reports detailing inpatient stays, allowing physicians to closely monitor the patient's hospital stay and use of costly resources. The extent to which the number of unnecessary days can be targeted may help the HMO better meet financial goals. In 1999, inpatient stays managed by hospitalists had reduced medically unnecessary days by 31 days, compared with an increase of 26 unnecessary days for inpatient stays managed by network PCPs. Given that every unnecessary hospital day cost the HMO about \$1150, hospitalists saved the HMO \$35,650 in 1999, whereas network PCPs cost an additional \$29,900 in unnecessary days alone. Of course, a full accounting of the cost savings would have to consider their impact on achieving ORG targets, which would reflect a significantly larger sum.

Caution must be exercised in interpreting these potential cost savings associated with lower hospital utilization. It is imperative for hospitalist programs

to examine the potential quality problems related to continuity of care.¹⁵ This is especially true for managed care–sponsored hospitalist programs. With growing concerns about managed care’s focus on cost rather than quality, managed care–sponsored hospitalist programs need to systematically assess the effects of hospitalists on quality and continuity of care.²⁰

Because hospitalists can monitor inpatient services and specialty referrals, and free up PCPs to manage larger patient panels, hospitalist programs may be perceived as another way for managed care providers to reduce utilization and treatment. Because this is a managed care–sponsored hospitalist program, there is a heightened need to address issues of quality, especially as public distrust of managed care continues.

These findings apply to a hospitalist program operating in a northwestern community in the United States, and thus caution must be exercised in generalizing these results to other regions.* In addition, it is critical to assess the effects of hospitalists on patient quality and satisfaction before arguing for widespread adoption of this innovation in the delivery of hospital services. This evaluation is *not* intended to advocate for the use of hospitalists in other delivery systems. Rather, the intent is to evaluate systematically one hospitalist program’s effects on inpatient utilization using a database that provides information about the medical necessity of the patient’s LOS.

*These data were from a not-for-profit HMO operating in the northwestern region of the United States since 1983. At the end of 1999, 194,343 members were enrolled in the staff and network delivery systems.

... REFERENCES ...

1. **Moore JD.** The inpatient’s best friend: “Hospitalists” specialize in managing care of the very ill. *Mod Healthc* 1997;27:54-62.
2. **Wachter R.** The emerging role of “hospitalists” in the American health care system. *N Engl J Med* 1996;335:514-517.
3. **Lurie JD, Miller DP, Lindenauer PK, Wachter RM, Sox HC.** The potential size of the hospitalist workforce in the United States. *Am J Med* 1999;106:441-445.
4. **Huff C.** Hospital heavies: Venture capital bulks up companies that outsource newest specialty: Inpatient-only care. *Hosp Health Netw* 1998;72:44-48.
5. **Wachter R.** An Introduction to the hospitalist model. *Ann Intern Med* 1999;130:338-342.
6. **Campbell S.** Market memo: Using hospitals to save money and attract patients. *Health Care Strategic Manage* 1998;16:1-4.
7. **Miller A.** Managed care spawns Dr. Hospitalist. *The Atlanta Journal Atlanta Constitution* May 11, 1997:D-10.
8. **Brink S.** The hospitalist. *US News & World Report*. July 27, 1998;125:48-57.
9. **Speer T.** The balancing breed. *Hosp Health Netw* 1997;71:44-46.
10. **Boodman S.** A growing number of hospitals are turning patients over to medicine’s new specialty . . . The Hospitalist. *The Washington Post* January 27, 1998:Z10.
11. **Rovzar M.** The many roles of the hospital-based physician. *Hosp Pract* 1997;32:201-202.
12. **Showstack J, Katz PP, Weber E.** Evaluating the impact of hospitalists. *Ann Intern Med* 1999;130:376-381.
13. **Vleck J.** The issue of “hospitalists” is one of political importance. *Wash Fam Physician* 1998;25:4-5.
14. **Morasch L.** *Family Physicians and Inpatient Care in the Era of the Hospitalist*. San Francisco, CA: California Academy of Family Physicians; 1998.
15. **Michota F, Lewis T, Cash J.** The hospitalist: Will inpatient specialists improve care? *Cleve Clin J Med* 1998;65:297-300.
16. **Wachter R.** Hospitalists fan winds of change, and inpatient care won’t be the same. *Managed Healthc* 1998;8:36-39.
17. **Diamond HS, Goldberg E, Janosky JE.** The effect of full-time faculty hospitalists on the efficiency of care at a community teaching hospital. *Ann Intern Med* 1998;129:197-203.
18. **Davis KM, Koch KE, Harvey JK, Wilson R, Englert J, Gerard PD.** Effects of hospitalists on cost, outcomes, and patient satisfaction in a rural health system. *Am J Med* 2000;108:621-626.
19. **Freese RB.** The Park Nicollet experience in establishing a hospitalist system. *Ann Intern Med* 1999;130:350-354.
20. **Craig DE, Hartka L, Likosky WH, Caplan WM, Litsky P, Smithey J.** Implementation of a hospitalist system in a large health maintenance organization: The Kaiser Permanente experience. *Ann Intern Med* 1999;130:355-359.
21. **Lindenauer PK, Pantilat SZ, Katz PP, Watcher RM.** Hospitalists and the practice of inpatient medicine: Results of a survey of the National Association of Inpatient Physicians. *Ann Intern Med* 1999;130:343-349.