

Patient-centered Management of Complex Patients Can Reduce Costs Without Shortening Life

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“Complex patients” have clinically advanced illness and multiple comorbid disease states. They are among the most expensive cases in healthcare.¹ The prevalence is 1 per 1000 in the commercially insured population and likely 5- to 10-fold higher in the Medicare population.^{2,3} Clinically appropriate hospice and home care services, available at significantly lower cost, can reduce expense, but decisions must be part of a holistic care plan individualized for each patient.

Patient-centered management (PCM) is an emerging, comprehensive patient-focused collaboration that includes end-of-life and pain management, education, provider coordination, and patient advocacy.⁴ It emphasizes the selection and coordination of services from the patient’s perspective and considers all of the patient’s circumstances. Patient-centered management should organize patient care sufficiently to avoid unnecessary hospitalizations and emergency department (ED) visits. Patient education should yield patients who are likely to make different treatment decisions.

Managed care organizations seem best positioned to use PCM with complex patients and healthcare providers,⁵ but the economic benefits of PCM are not clear. Throughout the 1980s and 1990s, managed care sought to deliver quality, cost-effective healthcare by managing utilization and costs of services.⁶⁻¹⁰ Today, many managed care organizations concentrate on “case management,” which includes the identification and coordination of plan benefits and ancillary services.¹¹ Case management tends to focus on services, whereas PCM focuses on the broader context of the patient. The key question addressed in this study is whether PCM can reduce utilization costs in complex patients compared with case management, without sacrificing life span.

An advantage of PCM is its ability to change patient behaviors and environments otherwise known to negatively influence care or yield unnecessary healthcare expense. For example, the World Health Organization made a strong case that medication adherence relies on patient information, motivation, and behavior, and that limitations and confusion in patients’ medication knowledge often lead to increased healthcare expense.¹²

Objective: To determine the effect of intensive patient-centered management (PCM) on service utilization and survival.

Study Design: Prospective cohort study of 756 patients in California who had a life-limiting diagnosis with multiple comorbid conditions (75% were oncology patients) and who were covered by a large commercial health maintenance organization from February 2003 through December 2004.

Methods: Group membership determined assignment to the PCM cohort versus the usual-management cohort after blindly screening for clinical complexity. Both cohorts accessed the same delivery system, utilization management practices, and benefits. Intervention was intensive PCM, involving education, home visits, frequent contact, and goal-oriented care plans.

Results: Roughly half (358) of the 756 patients received PCM. Fewer PCM oncology patients elected either chemotherapy or radiation (42% increase over usual-management oncology patients). PCM patients had reductions in inpatient diagnoses indicative of uncoordinated care: nausea (–44%), anemia (–33%), and dehydration (–17%). PCM patients had utilization reductions: –38% inpatient admissions (95% confidence interval [CI] = –37%, –38%), –36% inpatient hospital days (95% CI = –35%, –37%), and –30% emergency department visits (95% CI = –29%, –31%). PCM patients had utilization increases: 22% more home care days (95% CI = 20%, 23%) and 62% more hospice days (95% CI = 56%, 67%). Overall costs were reduced by 26% (95% CI = 25%, 27%). Patients’ lives were not shortened (26% of PCM patients died vs 28% of patients who received usual management) ($P = .80$).

Conclusion: Comprehensive PCM can sharply reduce utilization and costs over usual management without shortening life.

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Prior work showed that patterns of hospice use by older Medicare beneficiaries were consistent with the system of care and not necessarily with appropriate need and preference, leading to underutilization.¹³

A common approach to disease management involves outsourcing management to vendors, each servicing 1 condition. Many complex patients have more than 1 disease, and therefore multiple managers. Prior PCM approaches coordinated these services and reduced fragmented care.^{14,15}

Researchers showed that patient education, care coordination, and end-of-life management lowered costs and increased satisfaction without sacrificing mortality in patients who were coping with advanced illness and preparing for the end of life.¹⁶

Earlier work that attempted to prove the effect of case management on utilization and costs in other populations either lacked a control group,¹⁷ depended on crude comparisons,¹⁸ used only limited ad hoc resources as a proxy for management,^{17,18} or had been limited to examine only 1 form of utilization.¹⁹⁻²¹ The goal of this study was to evaluate the efficiency of care (measured by utilization of all key healthcare resources) and patient outcomes through the application of professionally delivered case management and PCM techniques.

METHODS

Study Design, Materials, and Resources

This study used a prospective cohort design with an “intent-to-treat” analysis to measure the performance of PCM compared with usual case management in a large health maintenance organization (HMO).

HMO Population. Candidates belonged to a large not-for-profit HMO. The average monthly HMO membership was 1 245 611 during the study period (February 2003 through December 2004). HMO membership consisted of 2 comparable groups (group A and group B) who had access to the same benefits (copayments, deductibles, coverage policies), network of providers, and HMO approval process. Group A averaged 447 541 members enrolled through governmental agencies. Group B included other employer groups and individual members and averaged 798 070 members. Comparing all health claims in the entire HMO population in 2002 (the year before the study), no significant sex, age, disease mix, or hospitalization differences appeared between these groups.

Blinded Patient Screening. Three sequential levels of screening identified study subjects as those candidates having appropriate illness complexity and management needs. Level 1 used an automated computer filter, level 2 used an experienced nurse to review patient records, and level 3 used an experienced nurse for telephonic interviews. Subjects were

those patients whose cases passed all 3 levels of screening. **Appendix A** provides a detailed description of the screening process (available online at www.ajmc.com).

Group Assignment. Once candidates passed screening, their health plan membership determined their membership in the intervention cohort (named “PCM” for those receiving PCM in addition to usual case management) or in the control cohort (named “UCM” for those receiving usual case management only). Throughout the screening process, the health plan membership (group A or group B) of candidates was unknown to remove incidental bias.

Although this design may appear to lend itself to cohort bias based on nonrandom assignment of subjects, cohort similarities justify the approach (see the HMO Population section above and the Results section below), and there are benefits to this approach (see the Study Analysis section).

Usual Case Management (Control). All subjects, regardless of cohort, received the same UCM from the HMO. This consisted of traditional episodic, telephonic coordination of services; the same clinical management criteria and process for approvals; the same benefit design (copayments, deductibles, coverage policies) and utilization management practices; and the same physician care plans available using the same criteria and process. The same primary physicians within the HMO handled all referrals.

Patient-centered Management (Intervention). An independent, for-profit program³ with 13 years of experience provided PCM. Each patient in the PCM cohort had a complex-care team consisting of (1) a care manager, who provided on-site assessment and ongoing contact; (2) a team manager, who coordinated team reviews and provided liaison with the health plan; and (3) a physician in active clinical practice, who provided the team with information on the medical care of the patient, anticipated the patient’s medical problems, and was available to contact the patient’s treating physician to clarify care issues and suggest alternative care plans in support of the treating physician’s plan. Care and team managers were registered nurses with an average of 18 years of nursing experience. The team did not provide medical treatments or home care, or authorize or deny any medical services.

All consenting subjects received an initial home evaluation by a care manager to establish goals. A goal addressed a care domain weakness, where care domains were disease knowledge, treatment plan, terminal care planning, benefit plan management, family and living environment, pain and symptom management, and provider support. (Appendix A further describes the care domains.)

During weekly meetings, team members reviewed patient status, developed strategies to accomplish goals, and tracked

progress. Team members placed telephone calls to patients, to providers, and to the health plan on behalf of patients. Management ended when patients achieved those goals established at the beginning of management. A patient achieved a goal by demonstrating proficiency (eg, verbal description of condition, or establishment of a hospice plan).

Utilization Dataset. A database stored services covered by the HMO. Fields included sex, age, 2-digit ZIP (or postal) code, cohort label, and the number of inpatient admissions, hospital days, ED visits, home care days, rehabilitation facility visits, skilled nursing facility admissions and days, and hospice facility admissions and days. For subjects in the PCM cohort, a field stored the total number of days of management. At the conclusion of data collection, a field stored decedent death times.

An independent company in the business of making privacy certifications under the Health Information Portability and Accountability Act (HIPAA) examined the dataset and certified it as satisfying both the scientific standard of HIPAA and HIPAA's Safe Harbor Provision for de-identification.²² Similarly, the dataset qualified for exemption under institutional review board guidelines.

Lifespan Assessment. Privacert, Inc, a for-profit data mining company,²² identified decedents and their dates and places of death by matching subject information to death records, death notices, burial records, and other publicly available death data. Data were summarized, anonymized, and then forwarded for academic analysis.

Average Charges. Average billed charges per unit of service use the Milliman 2004 Health Cost Guidelines, a compendium of national healthcare cost data published annually.²³ Milliman's data for a "well-managed" delivery system matches the California HMO environment. Charges were \$3576 for a medical inpatient hospital per diem; \$796 for an ED encounter; \$367 for a home care visit; and \$1089 for a skilled nursing facility per diem. Milliman lacked data for some categories, so average health plan per diems were \$1089 for rehabilitation and \$308 for hospice.

Study Analysis

This study uses the intent-to-treat principle.²⁴ Because randomization alone is not sufficient to provide unbiased comparison,²⁵ analysis includes all subjects in both cohorts equally, regardless of management deviations, insurance eligibility expirations, death, and various forms of nonadherence. Assessing cohorts under these conditions reveals the impact of exposure to PCM on the group's overall utilization of services.

The intent-to-treat principle is ideal because management is not limited to experimental control. Here are examples:

some patients who refused PCM benefited from the initial phone and visit interview that elicited participation because during those conversations nurses offered suggestions and brought attention to issues that patients may have subsequently addressed on their own. It is reasonable to expect that subjects who received PCM had better outcomes, but attempting to account for management received or nonadherence could bias evaluation. Patients who received UCM may have incidentally encountered similar recommendations as made by PCM. Patients who received PCM had varied amounts and foci of management. A patient in either cohort may have refused management altogether. Not analyzing all subjects in both cohorts equally could therefore lead to biased assessments.

RESULTS

Subject Selection and Description

From February 2003 through May 2004, 131 813 patients had acute patient care, making them study candidates. Blinded patient screening excluded 38.6% for not having sufficient illness complexity and 60.8% for not having significant care management needs. Blinded patient screening excluded most candidates (99.4%). Only 756 subjects remained.

Of the 756 subjects, 358 were in the PCM cohort and 398 subjects were in the UCM cohort. **Table 1** describes the subjects. Sex distributions were statistically the same (Fisher exact test, $P = .845$). Five-year age distributions were statistically the same (Spearman rank correlation, $r = 0.84$, $P < .0001$). Disease case mixes were statistically the same; 75% of subjects were oncology patients.

Geography. Southern California residents accounted for 72% (287 subjects) of the UCM cohort but only 43% (155 subjects) of the PCM cohort. Northern California residents accounted for 28% (110 subjects) of the UCM cohort and 56% (202 subjects) of the PCM cohort. Estimates of service utilization from Dartmouth data,²⁶ which describe how medical resources are distributed and used in the United States, yielded no significant difference among group locations. Furthermore, this study found no statistically significant differences among northern versus southern subjects in terms of resource utilization.

Time in Study. The time of entry limited the maximum time a subject spent in the study (**Table 2**). All patients had initial insurance eligibility from time of entry through study duration, but 92 subjects lost eligibility (presumably because of employment change or relocation). Each subject was in the study at least 3 months. The average number of months

Patient-centered Management

Table 1. Description of the Subjects Overall and by Cohort (UCM for Those Receiving Usual Case Management Only and PCM for Those Additionally Receiving Patient-centered Management)

Characteristic	All	%	PCM	%	UCM	%
Subjects	756	100	358	47	398	53
Sex						
Female	403	53	189	53	214	54
Male	353	47	169	47	184	46
Age						
0-9 years	33	4	9	3	24	6
10-19 years	19	3	11	3	8	2
20-29 years	18	2	3	1	15	4
30-39 years	55	7	21	6	34	9
40-44 years	62	8	30	8	32	8
45-49 years	112	15	52	15	60	15
50-54 years	152	20	72	20	80	20
55-59 years	183	24	102	28	81	20
60-64 years	122	16	58	16	64	16
Average	49		51		48	
Min, Max, SD	1, 64, 14		3, 64, 12		1, 64, 15	
Disease (6 most frequent of 16 total ICD-9 Broad Categories)						
Neoplasm	564	75	275	77	289	73
Circulatory System	25	3	11	3	14	4
Digestive System	24	3	10	3	14	4
Nervous and Sense	22	3	11	3	11	3
Ill-defined Conditions	21	3	9	3	12	3
Injury and Poisoning	18	2	10	3	8	2
SD indicates standard deviation.						

in the study was 9, with a median of 8 months and a standard deviation of 4 months. No significant time-in-study differences between cohorts were found.

Patient-Centered Management

Patient-centered management utilized 16 nurses and 2 physicians. Team members spent an average of 10 hours per patient per month. All 358 patients in the PCM cohort received an initial phone call. Of these, 249 (70%) consented to and received PCM directly from a complex-care team, which included an initial home visit. Subsequent home visits averaged 0.8 additional visit per case. Team members telephonically contacted each PCM patient an average of 14 times per month, and providers and the health plan made an average of 10 calls per month. Overall, team members made about 18 240 phone calls to patients, providers, and

the health plan. Patients in the PCM cohort received an average of 4 months of PCM (median of 3 months, standard deviation of 2 months). Thirty-six subjects received 1 month or less, and 1 patient received 12 months (over multiple episodes).

Utilization

Measuring utilization impact of PCM over UCM involves comparing subjects who were in the study for the same minimum amount of time and reporting utilizations observed by the HMO over the 18-month duration of the study. Effects of intervention appear long after management, so this study observed subject utilizations for up to 18 months. No statistical adjustments were needed.

All 756 subjects were in the study for at least 3 months. The left-most columns in **Figure 1A** report the average uti-

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Table 2. Minimum Duration of Subjects in Study (in Months) by Numbers of Subjects, Including Insurance Eligibility Losses, Decedents by Time in Study (for Time of Death see Figure 2), and Subjects Spending that Number of Months Total in Study Due to Late Time of Entry (Max)

Minimum Duration (Months)	Total				Patient-centered Management				Usual Case Management			
	Subjects	Max	Died	Eligibility	Subjects	Max	Died	Eligibility	Subjects	Max	Died	Eligibility
3	756	61	5	0	358	37	2	0	398	24	3	0
4	695	86	13	21	321	47	3	9	374	39	10	12
5	609	65	17	16	274	29	7	5	335	36	10	11
6	544	69	25	9	245	32	10	1	299	37	15	8
7	475	51	13	14	213	26	8	3	262	25	5	11
8	424	60	15	6	187	27	7	1	237	33	8	5
9	364	54	12	5	160	26	7	1	204	28	5	4
10	310	56	16	7	134	28	7	2	176	28	9	5
11	254	45	6	7	106	22	4	4	148	23	2	3
12	209	37	6	2	84	23	4	0	125	14	2	2
13	172	55	11	3	61	21	2	0	111	34	9	3
14	117	40	8	1	40	15	3	0	77	25	5	1
15	77	15	2	0	25	6	2	0	52	9	0	0
16	62	36	0	1	19	9	0	0	43	27	0	1
17	26	12	4	0	10	4	2	0	16	8	2	0
18	14	14	2	0	6	6	1	0	8	8	1	0
19	2	0	2	0	0	0	2	0	2	0	0	0
Totals	756	756	157	92	358	358	71	26	398	398	86	66

lizations for up to 18 months of HMO observation for all patients. The average number of hospital admissions was 1.2 in the PCM cohort and 1.7 in the UCM cohort. The reduction of 29.4% is marginally significant.

Some subjects entered the study earlier than did other subjects, and as a result they were available for longer analysis. Table 2 reports that 364 subjects were in the study for at least 9 months. The right-most columns in Figure 1A report the average utilizations for up to 18 months of HMO observations for these subjects. The average number of hospital admissions was 1.2 in the PCM cohort and 1.9 in the UCM cohort, with a 36.8% reduction that is statistically significant.

Overall, Figure 1A shows no significant difference between PCM and UCM utilization reductions (and increases) based on when subjects entered the study. Therefore, all further analyses used subjects who were in the study 9 or more months. A 9-month benchmark was at half the overall study time, included about half of all subjects, and allowed for 4.5 months of management.

Overall, PCM substantially reduced hospital admissions by 38% (95% confidence interval [CI] = -37%, -38%), hospital days by 36% (95% CI = -35%, -37%), and ED visits by 30% (95% CI = -29%, -31%), while dramatically increasing home care by 22% (95% CI = 20%, 23%) and hospice use by 62% (95% CI = 56%, 67%), as shown in Figure 1B. Although the percent reduction in nursing facility days appears dramatic, there were too few cases for generalized consideration. Figure 1B reports generalizations derived by bootstrapping,²⁷ with 1000 resamples over the population of subjects who were in the study 9 or more months.

Costs

The combined utilization costs used the average charges per day (see Average Charges in the Methods section) and the utilizations for those subjects in the study 9 or more months (Figure 1B). The average combined utilization cost in the PCM cohort was \$49 742 per patient for the 18-month study duration, compared with \$68 341 in the UCM cohort, giving an average savings of \$18 599 per patient.

Patient-centered Management

Figure 1. Comparison of Average per Patient Utilization Based on 18 Months of Observations

A	18-Month Utilization of Subjects in Study a Minimum of 3 Months					18-Month Utilization of Subjects in Study a Minimum of 9 Months				
	PCM		UCM		Change	PCM		UCM		Change
	Mean	Std	Mean	Std		Mean	Std	Mean	Std	
Hospital admissions	1.2	1.9	1.7	2.8	-29.4% b	1.2	1.9	1.9	2.9	-36.8% a
Hospital days	8.7	19.4	11.5	23.6	-24.3%	8.5	20.8	13.4	26.6	-36.6% a
Emergency room visits	1.0	2.2	1.3	2.6	-23.1%	1.0	1.7	1.5	2.5	-33.3%
Rehabilitation days	3.6	10.3	4.7	13.4	-23.4%	3.7	10.5	5.8	15.9	-36.2%
Hospice days	2.8	2.2	3	2.6	-6.7%	3.3	1.7	2.4	2.5	37.5%
Home care days	27.8	19.4	27.5	23.6	1.1%	36.8	20.8	30.9	26.6	19.1%

a Statistically significant ($P < 0.05$).
b Marginally significant ($0.05 \leq P \leq 0.06$)

B	Patient-centered Management (PCM)			Usual Case Management (UCM)			
	Service	Mean	Std	95% CI	Mean	Std	95% CI
Hospital admissions		1.2	1.9	0.9 to 1.5	1.9	2.9	1.5 to 2.3
Hospital days		8.5	20.8	5.2 to 11.7	13.4	26.6	9.7 to 17.0
Emergency room visits		1.0	1.7	0.8 to 1.3	1.5	2.5	1.2 to 1.9
Rehabilitation days		3.7	10.5	2.0 to 5.3	5.8	15.9	3.6 to 8.0
Hospice days		3.3	14.3	1.1 to 5.6	2.4	12.0	0.7 to 4.1
Home care days		36.8	76.1	24.9 to 48.7	30.9	60.6	22.5 to 39.2
Overall Cost (\$)		49 742	84 485	36 551 to 62 933	68 341	112 169	52 856 to 83 826

B	Change			
	Service	Mean	Std	95% CI
Hospital admissions		-37.7%	0.11	-38.4% to -37.1%
Hospital days		-36.3%	0.16	-37.2% to -35.3%
Emergency room visits		-30.1%	0.12	-30.9% to -29.4%
Rehabilitation days		-33.7%	0.21	-35.0% to -32.4%
Hospice days		61.5%	0.92	55.8% to 67.1%
Home care days		21.7%	0.26	20.1% to 23.3%
Overall Cost		-26.1%	0.13	-26.9% to -25.3%

Reductions appear as negative change values and increases as positive values. The intervention cohort (PCM) received patient-centered management and the control cohort (UCM) received only usual case management. (A) Average utilizations for patients in the study for a minimum of 3 months (left), and a minimum of 9 months (right). (B) Generalizations derived by bootstrapping²⁷ with 1000 resamples over subjects in the study 9 or more months.

The utilization costs of the HMO were comparable with the Milliman figures reported previously.²³ The gross savings in utilizations was more than 3 times the cost of providing PCM. Deducting the cost of providing PCM from the gross savings and dividing by the cost of providing PCM gave the HMO a 2:1 return on its investment. After deducting the cost delivering PCM, the HMO reported saving more than twice the cost of PCM.

Clinical Observations

The International Classification of Diseases diagnosis and Current Procedural Terminology procedure codes for subjects who were in the study 9 or more months highlighted clinical characteristics related to PCM (see Table 3). More oncology patients in the PCM cohort (47 [36%]) than in the UCM cohort (41 [26%]) had neither chemotherapy nor radiation—a marginally significant difference (Fisher exact test, $P = .06$).

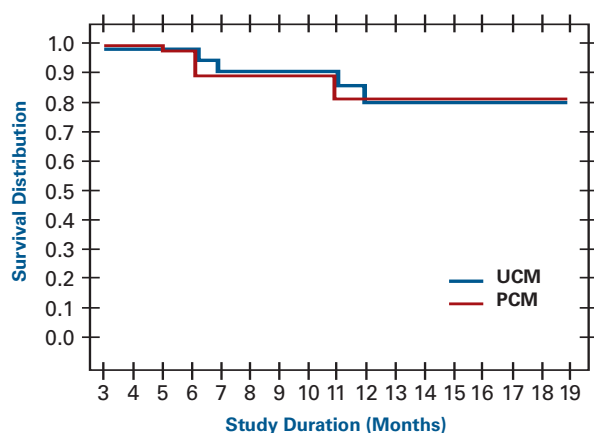
■ **Table 3.** Reductions of Clinical Services and Symptoms in the PCM and UCM Cohorts (9-Month Study Duration)

Subjects or Symptoms	Overall		PCM		UCM		% Reduction or Increase	P*
	No.	%	No.	%	No.	%		
Total number of subjects	364		160	44	204	56		
Oncology patients (total)	289	79	129	81	160	78		
Without chemotherapy	115	40	58	45	57	36	26	.14
Without radiation	211	73	97	75	114	71	6	.54
Without chemotherapy or radiation	87	30	47	36	41	26	42	.06 [†]
Inpatient symptoms								
Nausea and vomiting	32	11	10	8	22	14	-44	.15
Anemia	37	13	13	10	24	15	-33	.29
Fluid disorder, dehydration	34	12	13	10	21	13	-23	.54
Fever	30	10	12	9	18	11	-17	.73
Nutritional deficiency	4	1	0	0	4	3		
Metabolism	8	3	1	1	7	4		
Anxiety	3	1	0	0	3	2		

*P values were computed using the Fisher exact test.
[†]Marginally significant (.05 ≤ P ≤ .06).
 PCM indicates the cohort receiving additional patient-centered management intervention; UCM, the control cohort receiving usual case management only.

Patient-centered management reduced inpatient symptoms indicative of uncoordinated care: nausea (-44%), anemia (-33%), fluid disorder (-23%), and fever (-17%).

■ **Figure 2.** Survival Distributions for Each Cohort



The survival distributions were similar (80% PCM and 78% UCM; Wilcoxon P = .78).

The intervention cohort received patient-centered management (PCM) and the control cohort received usual case management (UCM) only. See Table 2 for death times based on study duration.

Life Span

By January 2005, a life span assessment identified 71 subjects in the PCM cohort and 86 in the UCM cohort as decedents. The proportions of decedents across cohorts were statistically similar (Fisher exact test, P = .80; Mantel-Haenszel test, P = .73], implying that PCM did not shorten life. **Figure 2** shows the survival curves with 80% of subjects in the PCM cohort and 78% in the UCM cohort surviving.

DISCUSSION

This study demonstrates that PCM can deliver coordinated, cost-effective care with no adverse effect on survival. Additionally, satisfaction was very high among those who received PCM (see **Appendix B**, available at www.ajmc.com).

Patient education seems to have resulted in patients making different treatment choices (less radiation and chemotherapy among oncology patients, for example), and in patients proactively being more adherent with care plans (fewer inpatient symptoms indicative of uncoordinated care). In turn, this decreased facility-based utilization (acute

hospital, ED) and increased use of outpatient services (home care, hospice).

Although PCM is reproducible, key ingredients are worth noting. The outbound call frequency from registered nurses to patients (2-3 times per week) enabled proactive identification of potential lapses in care—such as the brain cancer patient about to run out of his anticonvulsant. The registered nurse arranged for medication delivery, thereby thwarting the usual scenario of seizure, possible aspiration, ED visit, and hospitalization. The initial home visit often uncovered crucial details. One patient with metastatic lung cancer and multiple readmissions for diarrhea and dehydration confused his Lomotil and milk of magnesia. At the first home visit, the registered nurse discovered this fact and removed the offending bottle from the medicine cabinet.

Because the HMO practiced utilization management equally for both cohorts, the increase in the number of oncology patients seeming to forgo chemotherapy and radiation seems to result from patients making different informed decisions. Given reported death data, the “extra” chemotherapy and radiation experienced by the UCM cohort did not seem to produce any survival benefit. This result supports earlier findings^{20,13} that palliative end-of-life care planning is underused.

Patient-centered management decreased admissions associated with nausea, vomiting, and anemia. The decrease implies more coordinated care and the avoidance of clinical deterioration and acute readmissions.

Although underuse of hospice services has been demonstrated^{20,13} and hospice utilization increased under PCM, only a minority of patients actually transitioned to a formal hospice plan. This suggests that PCM may be more acceptable than a hospice approach to patients and families.

In conclusion, PCM effectively reduced costs through patient education, coordination, and support.

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Take-away Points

- Patient-centered management (PCM) can change patient behaviors and environments otherwise known to negatively influence care or yield additional healthcare expense.
- Comprehensive PCM in this California HMO involved education, home visits, frequent contact, and goal-oriented care plans for seriously ill patients.
- Patients receiving PCM had fewer inpatient admissions, hospital days, and ED visits, more home care and hospice days, and a reduction in expenses.
- Satisfaction was very high among patients who received PCM.
- Comprehensive PCM can deliver more coordinated, cost-effective care than traditional management, with no adverse effect on survival.

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