An Evaluation of the Advanced Illness Management (AIM) Program: Increasing Hospice Utilization in the San Francisco Bay Area

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ABSTRACT

Background: In the Medicare population, end-of-life care is fragmented and hospice is underutilized. Evidence suggests that hospice care is associated with increased patient/family satisfaction and reductions in overall health care costs. Advanced Illness Management (AIM) is a home-based program established to ease the transition between curative and comfort care for seriously ill patients who lack coordinated hospital, home health, and hospice care.

Objective: Measure the impact of the AIM program on the discharge disposition of participating home health patients.

Design: Retrospective cohort study.

Setting/subjects: A total of 435 patients who received home health services through the Sutter Visiting Nurse Association and Hospice (SVNA&H) and who were discharged between 2003 and September 2005 were included in this study. Participants were selected based on a life expectancy of 6 months or less and additionally matched on prognosis of current episode of illness and symptom status. Intervention patients were compared to those receiving usual home health care at two SVNA&H branches.

Results: In the within-branch comparison, a 28% difference was observed in the number of hospice referrals between patients who received the AIM intervention and Usual Care I (47% AIM; 33% UCI, \( p = 0.003 \)). When patients receiving the AIM intervention were compared to patients from another branch, Usual Care II, a 67% difference emerged (47% AIM; 16% UCII, \( p < 0.0001 \)). Among African American patients, 60% and 73% more patients were referred to hospice when AIM patients were compared to Usual Care I and Usual Care II patients, respectively (\( p < 0.01 \)). These differences persisted after controlling for symptom status, patient demographics and home health length of stay.

Conclusions: The AIM program was successful at increasing hospice utilization through a targeted intervention focused on palliative and end-of-life care, increased patient education and decision making, and a dynamic treatment approach. The finding of increased utilization by African Americans, a population traditionally reluctant to use hospice, was particularly noteworthy.

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INTRODUCTION

The population of the United States is aging at a rapid rate. By 2010, the U.S. Census Bureau estimates a 44% increase in the population aged 85 and older. This increase in longevity is associated with a higher prevalence of chronic conditions characterized by unpredictable disease trajectories and episodic needs for higher levels of care. Yet the United States health care system remains focused on the treatment and management of the pathophysiological aspects of acute illness. The symptoms and psychological needs of an aging population have been largely neglected.

Evidence suggests that current end-of-life care is often ineffective and expensive, with insufficient attention paid to pain management, which is agonizing to both patients and their families. Care preferences are seldom assessed and advance directives are often ignored. One study found that nearly one quarter of patients with severe heart failure stated that they would have preferred comfort-focused treatment, rather than the life-prolonging treatment they actually received. In addition, given the choice, most adults say they would prefer to die at home rather than in an acute care setting.

Hospice: benefits and barriers

One way to address the wishes of patients who prefer to die at home is through the increased utilization of Medicare’s hospice benefit, because at least 75% of hospice patients die at their current place of residence. The benefits of hospice, reimbursed by Medicare since 1983, include high-quality end-of-life care at home, in nursing homes, and in acute care settings. Care is provided by an interdisciplinary team that focuses on symptom management and relief of physical, emotional, and spiritual suffering. Hospice provides comprehensive services that allow patients to die at their place of residence in comfort, and provides bereavement services for the family for up to 1 year after the patient’s death.

Evidence suggests that hospice care results in improved outcomes and high levels of patient and family satisfaction. Hospice use has also been associated with reductions in hospital expenditures. Campbell and colleagues demonstrated a correlation between hospice enrollment and reduced Medicare expenditures among younger decedents with cancer. However, avoiding the cost of hospital-based life-saving procedures is not the only issue; more importantly, invasive inpatient care often causes distress, pain and discomfort to patients and their families. Simply stated, hospice is generally a low-cost, high-benefit option.

Despite these advantages, hospice remains widely underutilized. In 2004, hospice provided care for 1.06 million patients through 3650 agencies. While this is a marked increase from the 160,000 patients served in 1985, the potential of hospice care is still unfulfilled. The National Hospice and Palliative Care Organization has annually estimated the number of decedents who were also hospice appropriate (S. Connor, Alexandria, VA 2006, personal communication). Only 31% of all patients who died and were appropriate for hospice in 2004 died while receiving hospice services. In addition, patients who do enroll in hospice rarely utilize the full 6-month benefit. In 2004, approximately one third of hospice patients died 7 days or less after enrollment. Fewer than 5% of hospice patients are enrolled for longer than 6 months. Survivors of patients referred late to hospice report higher levels of unmet need and lower satisfaction with care.

Several barriers to hospice enrollment have been identified in the literature including those related to the health care system in general, specific hospice requirements, physician attitudes, lack of awareness and cultural mistrust, and the lack of transition between curative and comfort care.

Barriers presented by the health care system include Medicare-imposed limitations on eligibility for care, lack of a hospice benefit by many third-party payers, and a Medicare reimbursement structure that separates curative and palliative care while providing financial incentives for aggressive treatment.

Medicare’s Conditions of Participation for hospice contain rigid requirements for its providers that act as barriers to admission, as well as to continuous enrollment. Prospective hospice enrollees must sign away their right to Medicare coverage for life-prolonging medical treatment. Although the hospice benefit can be revoked at any time, this mandatory provision deters many patients and families from electing hospice treatment. Hospice eligibility is contingent on a prognosis of 6 months or less, and recertification for each benefit period requires the demonstration that the enrollee is in continuous clinical decline. Any patient
whose clinical course stabilizes must be discharged from hospice.

Physician barriers include incorrect knowledge, unfavorable attitudes toward hospice, and a knowledge deficit in palliative medicine in general. A mail survey of area physicians in East Lansing, Michigan, found that they were uncertain about most questions related to hospice policies and services. In addition, physicians report a need for more specific education in pain management as well as a need for improved skills in communication and treatment of emotional distress in patients and families.

Barriers specific to hospice use by ethnic minorities have created great disparities in utilization. Historically, hospice has been disproportionately utilized by Caucasian patients. Christakis and colleagues found that 92.4% of Medicare beneficiaries enrolled in hospice were white. Hospice use among African Americans has been reported to be 40% lower than among whites, independent of income and health care access. Several explanations have been posited to explain these differences including cultural mistrust and lack of awareness, potentially due to hesitation by physicians to discuss end-of-life care with African American patients. These cultural-specific barriers may benefit from special attention to increase hospice use among historically underutilizing population groups.

Finally, the lack of continuous transition between curative and comfort care, combined with prognostic uncertainty, have proven to be major barriers in hospice utilization. The agenda of hospital-based providers tends to be focused on disease-modifying treatment until most or all options for “cure” have run out, at which point hospital discharge, often without referral to hospice, becomes the goal. Patients are effectively forced to choose between comfort care and life-prolonging treatment. The route from acute hospital to home-based hospice care remains a bumpy one. The lack of a smooth passage between these two treatment extremes prevents patients from making what should be a seamless transition to a dignified death.

**Bridging the divide between acute care and hospice**

Attempts have been made to increase the utilization of hospice services through palliative care transition programs that create a bridge from hospitalization or home health to hospice. These programs provide a blended model of care combining palliative with curative practices. The focus of such programs is symptom management with an emphasis on earlier pain control, increased patient awareness of disease process and treatment choices, psychosocial and spiritual support and a gradual shift, when appropriate, from curative toward more palliative care. The care plan changes with the progression of illness as patients and families adjust their goals from disease-modifying toward supportive care.

There is currently limited evidence supporting such programs, particularly in the community setting, outside of the staff-model health maintenance organization (HMO) environment. A home-based palliative care program at Kaiser Permanente in Southern California found that the early integration of palliative care into curative care practices resulted in improved patient and family satisfaction and reduced costs. Patients participating in this program were also more likely to die at home than in the hospital. Another program targeting nursing home patients, which identified residents appropriate for hospice through structured interviews, increased hospice referral rates and family satisfaction while decreasing use of acute care services. While this program was not a traditional bridge program, it demonstrated the benefits of discussing end-of-life goals and preferences with patients and their families.

The Advanced Illness Management (AIM) Program, a home-based palliative care program, was designed to provide concurrent disease-modifying and comfort care to home health patients with advanced illness in an open community-based system of care. The purpose of the present study was to evaluate the impact of the AIM program on discharge disposition, specifically whether the program accomplished its goal of increasing enrollment into hospice.

**METHODS**

**Palliative care intervention: The AIM Program**

Established as a bridge between curative and comfort care, the AIM Program seeks to meet the needs of chronically ill patients who currently “fall between the cracks” of hospital, home health and hospice services. The program was estab-
lished at the Emeryville, California, branch of Sutter Health’s Visiting Nurse Association and Hospice (SVNA&H). Sutter Health is a network of not-for-profit hospitals and physician organizations in California that share resources and expertise to advance health care quality. The goal of the AIM Program is to eliminate the “revolving door” of care for men and women with advanced illness, replacing it with a strategic plan of service delivery tailored to meet the specific needs of individual patients at various stages of the illness trajectory. The AIM Program seeks (1) to provide a greater number of seriously ill patients with a broad array of home-based services; (2) to ease their transition from home health to hospice; and (3) to avoid unnecessary hospitalizations.

The home-based palliative care model was developed in 2002 as a direct outgrowth of CHOICES (Comprehensive Home-based Options for Informed Consent about End-stage Services), a nurse practitioner–based palliative care team model designed to deliver palliative care within the managed Medicare environment. CHOICES was 1 of 22 projects in the United States funded by The Robert Wood Johnson Foundation’s Promoting Excellence in End-of-Life Care initiative. With the decline of Medicare HMOs in 2000–2001, however, the number of covered lives served by SVNA&H was reduced so drastically that a new source of funding was needed. The AIM program was thus developed to work within the regulatory structure of Medicare-certified home health care, funded by home care’s Prospective Payment system and other home care payers.

The AIM Program employs a combination of home care and hospice staff to provide home-based palliative care to patients and families not yet ready for hospice, but eligible for home care, regardless of Medicare eligibility or insurance coverage. During 2002, all Emeryville branch home care nurse case managers were trained in AIM philosophy and methodology, which included a focus on disease process education, symptom management, goal clarification, and advance care and contingency planning.

Each case manager attended two 4-hour training classes, which covered the following specific areas:

- Palliative care definition and philosophy.
- History, description and purpose of AIM Program.
- Insurance coverage.
- Homecare and hospice regulations.
- Interface of AIM with hospice.
- Identification of AIM patients.
- Operations, including forms, orders, desired outcomes.
- Advance directives and advance care planning.
- Facilitating difficult conversations.
- Death and dying, including clinical and ethical issues.
- SVNA&H administrative policies addressing pain control and dying.
- Pain and symptom management.

AIM training staff included hospice and home health social workers, hospice and home health physicians, hospice and home health nurses, and the SVNA&H medical director.

At the conclusion of the training, trainees were given an extensive examination. Two weeks after the training, a 1-hour review session was attended by all trainees. Finally, all trained AIM staff participated in biweekly patient-centered conferences, which provided ongoing training related to end-of-life issues and symptom management.

AIM patients were guided through decisions about care options when they were ready to process the information. Unlike hospice, the AIM program did not require that a patient forego life-prolonging treatment. Instead, the value of current treatment was discussed, and when appropriate, alternatives were considered. In addition, AIM nurses focused specifically on education of patient and caregivers about disease process and prognosis, advance care planning, avoidance of unnecessary emergent care and hospitalization, aggressive management of pain, dyspnea and other symptoms, and facilitation of hospice enrollment. These nurses became the primary providers of care for the AIM patients. AIM began operating in March 2003 in western Alameda County and is currently undergoing dissemination into three other San Francisco Bay Area counties served by Sutter Health. The current study examines the AIM program at the Emeryville home health branch.

Referrals to AIM were initiated by hospital discharge planners, community physicians, the SVNA&H intake staff, and the home care staff providing care to homebound patients. All patients referred to the AIM program were home care patients and were therefore discharged from
the program when they were no longer eligible for home health services. The criteria for referral to AIM began with a “no” response to the following key question, “Would you be surprised if this patient died in 6–12 months?” as determined by the home health nurse. This was primarily an intuitive assessment in which the patient’s age, diagnosis, and functional or nutritional decline were taken into consideration. If the answer to this question was “no,” then patients were referred to AIM if they met any two of the following criteria:

1. Diagnosis of advanced cancer, advanced congestive heart failure (CHF), end-stage pulmonary disease, end-stage hepatic disease, end-stage neurologic disease, other end-stage medical diagnosis, or advanced debility and decline.
2. Failing or reduced effectiveness of nonpalliative treatment of primary disease process. For example, ineffective chemotherapy or radiation for cancer; refractory fluid overload for CHF; severe or frequent exacerbations of chronic obstructive pulmonary disease (COPD).
3. Decline in functional status and/or nutritional status in past 30 days.

Patients who were eligible for hospice, but who refused enrollment, were also eligible for AIM as long as they met home care eligibility criteria, although the majority of AIM patients were not yet eligible or ready for hospice. Once the determination was made that a patient was eligible for AIM, the program was described to the patient and/or family. Patients who refused hospice enrollment could agree to participate in AIM. The majority of patients agreed to participate in AIM when it was described to them as intended by the program developers. Approximately 71% of referrals were made internally, from within the SVNA&H system. Another 15% and 14% were referred from hospitals and physicians’ offices, respectively.

Usual care

Two Usual Care cohorts were created for this study. Usual Care I comprised patients from the same home health branch as the AIM program. Usual Care II patients were drawn from another demographically similar SVNA&H home health branch without an AIM Program. The second cohort was created to address potential treatment bias resulting from nurses caring for both AIM and non-AIM patients at the Usual Care I home health branch. Patients in all three cohorts were limited to those with a life expectancy of 6 months or less.

Patients in the Usual Care cohorts were matched to the AIM cohort on selected symptoms, i.e., pain, dyspnea, cognitive function, confusion, depression, and anxiety.

They were additionally matched on current prognosis, or their likelihood to recover from their current episode of illness. The majority of the patients in both Usual Care cohorts would have been eligible for AIM based on their current prognoses, life expectancy, and symptom status. Patients in both Usual Care cohorts received standard home health services, without the programmatic focus on palliative care, goal clarification, or advance care and contingency planning.

Data source

Home health data were gathered using the Center for Medicare and Medicaid Services (CMS)’s Outcome and Assessment Information Set (OASIS). These measures represent core items of a comprehensive assessment for adult home care patients and form the basis for evaluating patient outcomes for quality improvement purposes. The OASIS dataset is completed by a nurse at the time of admission to home care, every 60 days, when resuming homecare following a hospitalization and at discharge from home care. The OASIS data utilized in this study included information from the initial or “start of care” visit as well as the discharge or “end of care” visit. OASIS items include patient sociodemographic, environmental, support system, health status, and functional status characteristics. Some attributes of health service utilization are also included.

The reliability of these measures has been tested by the developers of the dataset. Additional testing in the research setting demonstrated excellent intrarater reliability ($\kappa > 0.75$) for urinary incontinence, pressure ulcers, anxiety, vision and hearing, and moderate reliability ($\kappa = 0.40–0.75$) for depressed mood, cognition, pain, bowel incontinence, and sleep.

Study participants

All study participants received home health services through the SVNA&H Emeryville or San
Leandro home health branches and were discharged alive to either hospice or the community between January 2003 and September 2005. During the study period, the Emeryville and San Leandro home health branches had an average daily census of 490 and 216 patients, respectively. All study participants were selected based on a discharge life expectancy of 6 months or less as recorded in the OASIS dataset.

This measure was based on the professional judgment of the clinician completing the assessment and other clinical input such as the patient’s age, comorbidities, expected disease progression, and the number of hospitalizations in past several months. This study criterion created a subset of AIM patients, since one of the enrollment requirements of AIM patients was a 6- to 12-month life expectancy. The additional limitation was imposed to create more similar comparison groups. Usual Care patients were additionally matched on selected symptoms and current episode of illness prognosis.

Figure 1 presents the study enrollment algorithm. From the inception of AIM in March 2003 through September 2005, 425 patients were enrolled in AIM at the Emeryville branch of SVNA&H. Of these, 140 were available in the OASIS database, had a prognosis of 6 months or less at the time of discharge from home health, and were enrolled in the Intervention Group of the study. During the same time period, 68 and 227 patients with a similar life expectancy, current episode of illness prognosis, and symptom status were enrolled into a Usual Care study group at Emeryville and San Leandro home health branches, respectively. None of the participants died during the study period.

**Statistical methods**

To measure the impact of the AIM Program on discharge disposition, i.e., hospice versus the community, univariate and multivariate analyses were conducted, utilizing a retrospective cohort design. AIM patients were compared to those receiving usual care at the two home health branches described above on the outcome variable of discharge disposition. Independent vari-
Variables examined in these analyses included symptom status, demographic and administrative characteristics, and home health length of stay.

The evaluation of this home health care model was supported through funding from both the Metta Fund and Aetna. This study received exempt certification from the Sutter Health Services Institutional Review Board.

**RESULTS**

A sample of 140 AIM patients, 68 Usual Care I, and 227 Usual Care II patients was available for analysis. Table 1 provides a descriptive comparison of the three study groups. Study groups were demographically comparable on most characteristics. Usual Care I had significantly more female patients than the Intervention group \((p = 0.04)\). Usual Care II had significantly fewer African American and more Hispanic patients \((p = 0.02)\).

Compared to the Intervention group, the patients in Usual Care II were more likely to be cared for by their children \((p = 0.02)\) and less likely to have paid help \((p = 0.04)\). Patients in the Usual Care II group had a shorter length of stay than the Intervention group \((p < 0.01)\). Study groups were comparable in terms of age with more than 80% of patients in all groups aged 65 and older. More than half of the patients in all three cohorts were white. Approximately 60% of patients used Medicare fee-for-service as their primary payer, followed by Medicare managed care (19%), and private HMO insurance (13%).

Table 2 describes the symptom status of the Intervention and Usual Care groups. The results of univariate analysis found Usual Care patients to be significantly more likely to suffer from symptoms of confusion \((p < 0.01)\) and to have been given a poor prognosis for their current episode of illness \((p < 0.0001)\). While more than three quarters of patients in all groups experienced symptoms of dyspnea and cognitive impairment, the differences between groups were not significant. At the start of care, Usual Care patients in both cohorts were significantly more likely to have a life expectancy of 6 months or less \((p < 0.0001)\). All patients in all three cohorts had a life expectancy of 6 months or less at the time of discharge.

Table 3 compares the discharge disposition for AIM and Usual Care patients. A 28% difference was observed in the number of hospice referrals between patients who received the AIM inter-

### Table 1. Demographic Characteristics of Advanced Illness Management and Usual Care Patients

<table>
<thead>
<tr>
<th></th>
<th>AIM ((n = 140))</th>
<th>Usual Care I(^a) ((n = 68))</th>
<th>Usual Care II(^b) ((n = 227))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group (@SOC)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;65</td>
<td>17.3%</td>
<td>16.2%</td>
<td>16.2%</td>
</tr>
<tr>
<td>65–75</td>
<td>20.5%</td>
<td>10.3%</td>
<td>17.8%</td>
</tr>
<tr>
<td>76–85</td>
<td>30.7%</td>
<td>30.9%</td>
<td>34.0%</td>
</tr>
<tr>
<td>&gt;85</td>
<td>31.5%</td>
<td>42.6%</td>
<td>32.0%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>58.3%</td>
<td>73.5%(^c)</td>
<td>61.9%</td>
</tr>
<tr>
<td><strong>Race/ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>26.8%</td>
<td>23.5%</td>
<td>16.2%(^c)</td>
</tr>
<tr>
<td>Asian</td>
<td>5.5%</td>
<td>11.8%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.4%</td>
<td>2.9%</td>
<td>8.9%(^c)</td>
</tr>
<tr>
<td>White</td>
<td>63.0%</td>
<td>57.4%</td>
<td>53.9%</td>
</tr>
<tr>
<td>Other</td>
<td>1.0%</td>
<td>1.5%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Unknown</td>
<td>1.3%</td>
<td>2.9%</td>
<td>9.6%</td>
</tr>
<tr>
<td><strong>Primary Caregiver</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse or significant other</td>
<td>31.5%</td>
<td>20.6%</td>
<td>29.6%</td>
</tr>
<tr>
<td>Daughter or son</td>
<td>26.0%</td>
<td>25.0%</td>
<td>38.5%(^c)</td>
</tr>
<tr>
<td>Other family</td>
<td>6.3%</td>
<td>14.7%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Paid help</td>
<td>18.1%</td>
<td>20.6%</td>
<td>10.5%(^c)</td>
</tr>
<tr>
<td>Other</td>
<td>18.1%</td>
<td>19.1%</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

\(^a\)Usual Care I refers to the within-branch cohort at the Emeryville SVNA&H branch.

\(^b\)Usual Care II refers to the external branch cohort at the San Leandro SVNA&H branch.

\(^c\)Denotes \(p < 0.05\) as compared to intervention (AIM) cohort.

AIM, Advanced Illness Management; SOC, start of care; SVNA&H, Sutter Visiting Nurse Association & Hospice.
vention and Usual Care I (47% AIM; 33% UCI, \( p = 0.003 \)). When patients receiving the AIM intervention were compared to Usual Care II patients, a 67% difference emerged (47% AIM; 16% UCI, \( p < 0.0001 \)). Among African American patients, 60% and 73% more patients were referred to hospice when AIM patients were compared to Usual Care I and Usual Care II patients, respectively (\( p < 0.01 \)).

These observed differences in discharge disposition persisted after controlling for patient symptom status, current episode of illness prognosis and home health length of stay. Compared to the Usual Care II group, the AIM intervention emerged as an independent predictor of discharge to hospice (\( p < .0001 \)) along with home health LOS (\( p = 0.008 \)) and current illness prognosis (\( p = 0.03 \)) were also independent predictors of discharge to hospice. To further control for home health length of stay, an additional analysis was conducted eliminating patients with a home health length of stay falling into the lowest quartile in an attempt to increase the comparability of cohorts. While this step did reduce differences in home health length of stay, it did not alter the study findings.

**DISCUSSION**

The AIM program was designed to address the needs of patients who are not yet eligible or not

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### Table 2. Symptom Status of Advanced Illness Management and Usual Care Patients

<table>
<thead>
<tr>
<th>Symptom Status</th>
<th>AIM (n = 140)</th>
<th>Usual Care I (^a) (n = 68)</th>
<th>Usual Care II (^b) (n = 227)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortness of breath</td>
<td>79.5%</td>
<td>76.5%</td>
<td>81.0%</td>
</tr>
<tr>
<td>Confusion</td>
<td>79.5%</td>
<td>86.8%(^c)</td>
<td>89.5%(^c)</td>
</tr>
<tr>
<td>Cognitive function</td>
<td>78.0%</td>
<td>86.8%</td>
<td>85.4%</td>
</tr>
<tr>
<td>Anxiety</td>
<td>51.2%</td>
<td>58.8%</td>
<td>52.6%</td>
</tr>
<tr>
<td>Poor prognosis</td>
<td>43.3%</td>
<td>95.6%(^c)</td>
<td>96.8%(^c)</td>
</tr>
<tr>
<td>Life expectancy &lt;6 mo. SOC</td>
<td>59.0%</td>
<td>86.8%(^c)</td>
<td>90.3%(^c)</td>
</tr>
<tr>
<td>Life expectancy &lt;6 mo. EOC</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pain</td>
<td>60.6%</td>
<td>55.9%</td>
<td>70.0%</td>
</tr>
<tr>
<td>Depression</td>
<td>33.0%</td>
<td>33.8%</td>
<td>25.5%</td>
</tr>
</tbody>
</table>

\(^a\)Usual Care I refers to the within-branch cohort at the Emeryville SVNA&H branch.

\(^b\)Usual Care II refers to the external branch cohort at the San Leandro SVNA&H branch.

\(^c\)Denotes \( p < 0.05 \) as compared to intervention (AIM) cohort.

AIM, Advanced Illness Management; SOC, start of care; EOC, end of care; SVNA&H, Sutter Visiting Nurse Association & Hospice.

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### Table 3. Discharge Disposition of Advanced Illness Management and Usual Care Patients

<table>
<thead>
<tr>
<th>Discharge Disposition</th>
<th>AIM (n = 140)</th>
<th>Usual Care I (^a) (n = 68)</th>
<th>Usual Care II (^b) (n = 227)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospice</td>
<td>47.2%</td>
<td>33.8%(^c)</td>
<td>15.8%(^d)</td>
</tr>
<tr>
<td>Community</td>
<td>53.0%</td>
<td>66.2%</td>
<td>84.2%</td>
</tr>
<tr>
<td>Race = African American</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospice</td>
<td>47.0%</td>
<td>18.8%(^e)</td>
<td>12.5%(^f)</td>
</tr>
<tr>
<td>Community</td>
<td>53.0%</td>
<td>81.2%</td>
<td>87.5%</td>
</tr>
</tbody>
</table>

\(^a\)Usual Care I refers to the within-branch cohort at the Emeryville SVNA&H branch.

\(^b\)Usual Care II refers to the external branch cohort at the San Leandro SVNA&H branch.

\(^c\)Denotes \( p < 0.05 \) as compared to intervention (AIM) cohort.

\(^d\)\( p = 0.003 \), controlling for race, LOS, symptom status, and prognosis.

\(^e\)\( p = 0.008 \), controlling for LOS, symptom status, and prognosis.

\(^f\)\( p = 0.0001 \), controlling for LOS, symptom status, and prognosis.

AIM, Advanced Illness Management; SVNA&H, Sutter Visiting Nurse Association & Hospice; LOS, length of stay.
ready to accept hospice. The components of the intervention were aimed at increasing patient understanding of his or her illness, including the changing array of treatment options through the trajectory of the individual’s disease. Efforts were made to prepare patients for important end-of-life decision making. As a result, it was expected that patients’ understanding of hospice, and therefore its utilization, would increase. The program was successful in this respect.

The addition of a second cohort was paramount in controlling for potential contamination resulting from the creation of a cohort at the same home health branch where the intervention was implemented. Indeed, the finding of a greater effect among patients in the Usual Care II cohort suggests that some degree of contamination did occur. This is consistent with the fact that AIM nurses cared for both AIM and non-AIM patients at the Usual Care I home health branch.

The finding that AIM had an even greater effect on African Americans is impressive and warrants further investigation. The proportion of African American discharges from AIM to hospice was almost identical with that of Caucasian patients. Any program that can increase hospice utilization among a population historically ambivalent to participation is promising. Several studies support the notion that lack of awareness may be contributing to this observed underutilization. Rhodes and colleagues found that half of African American families surveyed were not informed about hospice, particularly those with a diagnoses other than cancer. Another study comparing African American with white decedents found the former to be 2½ times as likely to have experienced problems with being informed about end-of-life care. This explanation is the most congruent with a major component of the AIM program: increasing awareness and understanding of hospice. In addition, it is possible that the AIM program’s promotion of unrestricted choice in treatment modalities removed a barrier to hospice enrollment that has been attributed to the perception among African Americans that referral to hospice may be associated with denial of treatment.

There are several limitations to this study. Because primary diagnosis is not available for home health patients in the OASIS database, the selection of study cohorts was based on prognosis in the current episode of illness, overall life expectancy and symptomatology. Additionally, the validity of these and other measures found in OASIS has not been well tested and requires further study. The correlation between prognosis and death in this database is unknown, but clinicians tend toward conservatism in determining prognoses. Evidence suggests a reluctance among physicians to bestow limited prognoses on patients. Better predictors of mortality based on OASIS data are currently being explored. Finally, data on the number of total and weekly visits would also have potentially helped create better matched comparison groups.

While the study groups appear comparable on many characteristics, there remain several unanswered questions. Despite their more limited prognoses and more severe symptom status, patients in the Emeryville home health branch Usual Care I group were not referred to the AIM program. Without conducting clinician interviews, reasons for nonreferral cannot be determined with certainty.

In this observational study, we cannot reach definitive conclusions regarding causality in the association between the AIM program and hospice enrollment. Appropriateness for and interest in hospice may have predisposed to AIM referral, rather than being a result of it. However, the fact that patients in both Usual Care cohorts had poorer prognoses, combined with the absence of an AIM program at the Usual Care II site, helps reduce the likelihood of such a bias. A randomized trial of the AIM intervention would provide a stronger test of its effect on hospice enrollment.

Next steps in the evaluation of the AIM program include an economic evaluation to determine whether enrollment in AIM prevents unnecessary and costly hospitalizations, as would be expected with increased hospice enrollment. Additional service measures will be examined including hospice length of stay as well as emergency department care utilization. An expanded evaluation of AIM programs throughout Sutter VNA&H will be informative regarding the generalizability of the results of this study, and will include a patient/family satisfaction component, as well as an assessment of symptom management. Additional studies of home-based palliative care are needed to identify best practices and provide guidance for the development of appropriate reimbursement policy.
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