

Special Article

Hospice Underutilization in the U.S.: The Misalignment of Regulatory Policy and Clinical Reality



Perry G. Fine, MD

*Department of Anesthesiology, Division of Pain Medicine, School of Medicine, University of Utah, Salt Lake City, Utah, USA***Abstract**

After three and a half decades of experience with the Medicare hospice benefit in the U.S., despite excellent quality outcomes in symptom management, patient and family satisfaction, and reduction in health care costs, only 12%–15% of beneficiaries' days during the last year of life are spent being cared for within the highly cost-effective interdisciplinary coordinated advanced illness care model known as hospice. Although there are many reasons for this, including difficulties in acknowledging mortality among patients, their families, and physicians, a significant cause of low overall hospice utilization and intractably low median lengths of stay, reflective of late admissions, can be attributed to increasingly difficult and highly variable prognostic determinations for most of the leading causes of death among Medicare beneficiaries. Medicare is the payer for most hospice care in the U.S. and requires certification of a prognosis of six months or less for a beneficiary to access hospice support. At the time of admission to hospice, two physicians must predict that a patient is more likely to die in the next six months than survive, based on clinical status. In addition to prognostic uncertainty constituting a barrier to timely hospice referral, the Centers for Medicare and Medicaid Services and its payer contractors have developed a robust and expensive retrospective review process that penalizes hospices when patients outlive their expected prognosis. The administratively burdensome and financially punitive review practices further delay or limit access to care for eligible patients as certifying physicians and agencies, fearful of the financial and legal repercussions of reviews and audits, are hesitant to take patients under care unless they are clearly in the dying process. This article will review pertinent history and address the core problem of access to a health care benefit built on a policy that requires far greater prognostic certainty than any clinician can reasonably ascertain and fails to take into consideration the favorable impact hospice care has on terminally ill patients in improving prognosis. This clinical conundrum that limits access of seriously ill people to high-value quality care is of profound importance to the U.S. Medicare population and also one with potential relevance to all complex and regulated health systems and to other models of care whose eligibility criteria are based on prognostication. *J Pain Symptom Manage* 2018;56:808–815. © 2018 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Key Words

Hospice, Medicare hospice benefit, hospice eligibility, hospice utilization, prognostic uncertainty, prognostication, terminal illness

We learn from history that we do not learn from history.

George Wilhelm Friedrich Hegel (1770–1831)

Introduction

Despite an increasing number of Medicare beneficiaries and proportionate annual deaths among them, overall hospice admission rates began to plateau in 2014. After three and a half decades of experience with the Medicare hospice benefit (MHB) in the U.S., with high patient and family

satisfaction, only 12%–15% of beneficiaries' days during the last year of life are spent receiving care within the interdisciplinary coordinated advanced illness care model known as hospice.¹

Although there are several possible explanations for the overall low utilization of this cost-effective and high-value benefit, a major reason is to be found in the interpretation of its eligibility criteria. Improvements in admission rates did occur after clinical eligibility guidelines became widely available, but obstacles imposed by misapplication of these tools have prevented timely admission, leading to

Address correspondence to: Perry G. Fine, MD, Department of Anesthesiology, Division of Pain Medicine, School of Medicine, University of Utah, Pain Research Center, Suite

200, 615 Arapeen Drive, Salt Lake City, UT 84108, USA.
E-mail: perry.fine@hsc.utah.edu

Accepted for publication: August 11, 2018.

perpetually low hospice median lengths of stay. This article will review pertinent history and address the problem of an entitlement and its payment adjudication policy built on prognostic uncertainty, presenting an object lesson with potentially profound importance to the U.S. Medicare population and also one with potential relevance to all complex and regulated health systems and to other care delivery models whose eligibility criteria are based on prognostication.

Historical Background

The roots of hospice can be traced to early Christianity, as places of respite for weary travelers. These refuges spread through the Byzantine and Greek cultures, and later the Roman Empire, where the Latin term *hospitium* was adopted, and its derivation continues today. Through the Middle Ages and during the crusades, hospices proliferated and expanded their role to provide care for the sick and dying but then virtually disappeared during the reformation. Then, in 19th century, in Ireland and France, hospices were established specifically to provide terminal care. A century later in the 1960s, through her experiences in these sorts of settings and testing the benefits of around-the-clock analgesics for pain control in patients with far advanced cancer, Dame Cecily Saunders went on to promote the current age of hospice, beginning at St. Christopher's in London.²

The concept of hospice migrated to the U.S. in the 1970s, beginning with small grassroots programs and demonstration projects, with resultant legislation that created a payment stream for these services, the MHB, beginning in 1983. The subsequent decades saw continued modernization and rapid expansion of hospice services, mostly in the home environment, concurrent with growing acceptance of palliative medicine as a credible and much-needed specialty and domain of the health care continuum to improve advanced illness and end-of-life care. During those formative years, hospice broadened its scope from a service almost entirely dedicated to cancer patients to the care of all patients with life-limiting illnesses such as end-stage cardiac or pulmonary disease and advanced dementia (e.g., Alzheimer's disease).

The essential philosophy of hospice care is its focus on comfort, dignity, and personal growth at life's end. This encompasses biomedical, psychosocial, practical, and spiritual aspects of the dying experience, emphasizing quality of life and healing or strengthening interpersonal relationships, rather than prolongation of the dying process at any and all cost.³ To reach these goals requires expertise in

pain and symptom management as well as deep understanding of intrapersonal and interpersonal dynamics at this unique time in the human life cycle. In addition, hospice care supports the well-being of those identified as family and in primary caregiving roles and provides bereavement care for survivors for 13 months after the death of the patient.

Modern hospice care is a team effort, with the typical hospice interdisciplinary team consisting of physicians, nurses, advanced practice nurses, nursing assistants, psychosocial care providers (social workers), spiritual care providers (chaplains), and other supportive care professionals as needed (nutritionist, physical therapist, pharmacist, speech therapist, etc.). A hallmark of current hospice care in the U.S., and a requirement under the Conditions of Participation of the MHB, is the involvement of volunteers, who provide visitation, companionship, housekeeping help, errands, and many other types of needed assistance.⁴

In the U.S., by intent, most hospice care is provided in the home, but it can be rendered in any environment, including inpatient settings, long-term care facilities (nursing homes and assisted living centers), or anywhere else that patients reside. There are currently more than 4000 Medicare-certified hospice programs operating within the U.S. Most are small community-based programs with an average daily census of less than 50 patients. During the last decade, there has been a trend toward consolidation and mergers to form larger and multisite hospice programs, both in an effort not only to create operating efficiencies of scale and optimize use of innovative information systems but also to generate predictable return on investment or operating margin.⁵

Good Intentions and Problematic Policy

To access this end-of-life care benefit, the Centers for Medicare and Medicaid Services (CMS) requires certification of a terminal prognosis by a patient's treating physician and a hospice medical director. Including this statutory requirement, this benefit was further established on three essential premises: 1) it would broaden care choices and add quality days to beneficiaries' lives; 2) there would be no increased cost compared with conventional Medicare Part A (hospitalization) coverage; and 3) physicians would be able to judge with accuracy when their patients will die.² After 35 years of this social experiment, the first two premises have been substantiated with ample evidence that hospice care offers great value by providing patients and their respective families high-quality care and emotional support at a lower

cost than traditional Part A expenditures for matched cohorts.⁶ But the last premise has been proved egregiously wrong.⁷

Because there was not then—and still is not now—an accepted time-based definition of terminal illness, an arbitrary time frame of six months was chosen, based largely on federal budget and cost-neutrality determinations. A life expectancy of six months or less was codified by congress and Medicare into statutory and regulatory language that framed conditions of participation for this benefit. But recognizing the limits of physicians' abilities to accurately predict life expectancy, congress included qualifying language in the statute, placing the authority of life-expectancy determination (prognosis) within the hands, and according to the clinical judgment, of certifying physicians.

In the early years, there was poor overall utilization of this benefit, both in terms of timeliness of referral and percent of terminally ill patients accessing any hospice care at all. After the first 10 years, there was a threefold increase in annualized hospice admissions, but still only one in five Medicare beneficiaries received any hospice care.⁸ Although average lengths of stay increased from 30 to 50 days, reflecting a greater medical and social acceptance of hospice care for patients who are not imminently dying, median lengths of stay of 17–18 days has been remarkably intransigent to change, including through the most recent reporting year.⁹ Against a background of low overall hospice utilization, but rising hospice expenditures, two important—and seemingly disparate—events coincided. One recognized the need to facilitate more timely access to hospice services for eligible beneficiaries, and the other questioned appropriate assignment of this benefit and accentuated the need for regulatory oversight.

First, the National Hospice Organization (now the National Hospice and Palliative Care Organization) developed medical guidelines for hospice care for noncancer diseases.¹⁰ The purpose of this effort was to bring the hospice benefit to all terminal patients—not just those with cancer—and help physicians identify these patients far earlier than the last few days of life. The limits of these guidelines were clearly recognized by those involved in creating them as they had never been validated. It was acknowledged that they would also lack *sensitivity* and *specificity*—poor sensitivity, because they would disqualify numerous patients who would die within six months, and poor specificity, because they would qualify others who would survive longer than six months. These predictions have been borne out by annual vital statistics reports and Medicare program utilization data,¹¹ among other sources.

A Problem of Sensitivity

A community-based hospice study evaluated accuracy of local medical review policy (LMRP) criteria for a range of patients thought to be eligible for the MHB by certifying physicians.¹² They found that only 35% of patients who died within six months of admission to the hospice met the Medicare proposed criteria for hospice eligibility. The median and mean survival times of the sample were 14 and 30 days, respectively. The authors concluded that, “Based on this review, it is recommended that Medicare alter their proposed review policies and not limit access to hospice eligible patients who desire and are in need of such services.”

A Problem of Specificity

In 1999, Fox et al.¹³ published one of the first large cohort prospective studies evaluating longevity in seriously ill patients with advanced heart, lung, or liver disease who survived hospitalization. Of those determined to be hospice eligible, based on physician prognostication of less than six months survival, 70% lived longer. The authors concluded that, “Recommended clinical prediction criteria are not effective in identifying a population with a survival prognosis of 6 months or less.”

Subsequent studies evaluating the increasingly common life-limiting condition of advanced dementia demonstrated the poor predictive accuracy of the prognostic tool used by Medicare contractors to determine hospice eligibility. In their seminal study, Schonwetter et al.¹⁴ concluded, “The Kaplan-Meier estimation of survival and a Cox regression analysis ($P > 0.05$) revealed no significant relationship between the Medicare guidelines or any component of the guidelines and survival at six months for the initial and validation samples. Overall, the results indicated that the Medicare guidelines were not valid predictors of survival in hospice patients with dementia and should be altered to include empirically valid predictors.” To date, there are no empirically validated predictors of life expectancy beyond an experienced physician's clinical judgment. The same is true of adult failure to thrive, advanced frailty, and progressive debility without specific organ system failure, which may affect up to a third of Medicare decedents. As it turns out, with ample exposure to patients with a variety of advanced illnesses, along with an experience of reassessing and managing them over time, physicians become reasonably adept at guesstimating life expectancy of patients who are not actively dying, within a range of several months to a year.¹⁵

The other salient event of that era was the conclusion of a 1995 federal initiative aimed at

home health and hospice, known as Operation Restore Trust.¹⁶ It was designed to be a two-year partnership of federal and state agencies intended to protect the health care trust funds more effectively through shared intelligence and coordinated enforcement and to enhance the quality of care for the programs' beneficiaries. The project targeted five states that together accounted for 40% of the nations' Medicare and Medicaid beneficiaries. Although the Department of Health and Human Services Office of the Inspector General concluded that the MHB was functioning well,¹⁷ supplementary reports were released that identified the components of a functional compliance program for hospices and delineated risk areas, chief among them being admission of patients to hospice care who are not terminally ill.¹⁸ So, in the absence of greater definition around clinical determinants of life expectancy for prognosis of six months, hospice programs and Medicare contractors embraced what was closest at hand—clinical guidelines that had never been prospectively validated.

Notwithstanding these obvious concerns, a sanguine view of the potential value and utility of having prognostic guidelines was expressed at the time by several leading clinicians in the field. For example, Dr. Barry Kinzbrunner, Chief Medical Officer for the largest hospice at the time, said, "Hospice Medical Directors, other hospice workers, attending physicians and health-care providers who refer patients to hospice programs are finding the guidelines to be an extremely useful tool in the process of evaluating patients for prognosis and hospice eligibility."¹⁹ In an effort to meet their own regulatory requirements as defined by the Office of the Inspector General, the guidelines rapidly became embraced by the U.S. Health Care Financing Agency (now the CMS) and incorporated by Medicare fiscal intermediaries (now Medicare administrative contractors [MACs]) as the first LMRPs (transitioned to local coverage determinations [LCDs] in 2003) defined for Medicare Part A benefit. At the time, fiscal intermediary medical directors recognized the negative and positive predictive limits of these guidelines and created advisory groups of hospice providers to assure their proper interpretation and use. But over time, this intent became lost as program integrity staff within CMS and eligibility review staff (medical directors and nurse reviewers) within MACs turned over (as did the MACs themselves). The LCDs became the compliance standard for hospice eligibility, albeit without scientific justification and absent their predictive accuracy in determining life expectancy of six months or less.

Those who were more skeptical about the effects of the guidelines becoming review policies proved to be

prescient. For instance, in a May 2000 letter to the *Journal of the American Medical Association*, social worker and hospice executive David Simpson²⁰ noted, "These policies not only expand the authority of the intermediary beyond the scope of the law that created hospice under Medicare, but they also diminish the role of physician judgment in the referral process." He goes on to observe that, "Medicare intermediaries latched onto the guidelines in an effort to produce a standardized basis for referrals to hospice. In effect, they converted the guidelines from sufficient conditions for having the conversation about end-of-life care to necessary causes. This has the effect of further reducing the availability of hospice care to the very people who would most benefit from it."

Many hospice physicians rigidly adhered to LMRPs and then LCDs as a standard, also seeking bright-line distinctions in predicting life expectancy for fear of a backlash if they guessed wrong; that is, if patients lived too long. They became fearful of regulatory retribution against their medical licensure, refusing to certify patients for hospice care unless every LCD box could be checked. This self-reinforcing and self-fulfilling behavior effectively excluded many patients from ever receiving hospice care. Although no one is held to account for under-referral, hospices are held to account for arbitrarily determined excessive live discharge rates (patients discharged from hospice before death) if patients live too long because of poor specificity of the LCDs or live longer because of hospice care itself. Thus, the cohort of Medicare beneficiaries who are admitted to hospice becomes a biased sample that is then only compared against itself in creating long lengths of stay error rates under current regulatory and administrative procedural methodologies. These error rates are then used by MACs to withhold payment. Worse, these misappropriated clinical tools and falsely set thresholds are used to support rapidly increasing assertions of false claims.²¹

Prognostic Uncertainty

Physicians are frequently called on to forecast the probable outcome or course of a disease. Patients and their families want to know the chance of recovery and how treatment options may influence outcomes. Diagnosis always informs prognosis, but except in certain types of cases (e.g., an obviously rapidly and irreversibly progressing condition), predicting life expectancy for most chronic progressive conditions, including many malignancies, within months to years is highly unreliable. Medical and social factors are tightly bound and intertwined. Life expectancy means and medians can be determined with broad error bars

for various cohorts within the Medicare pool, but these change with medical advances influencing morbidity and mortality, and confidence intervals cannot accurately describe eventualities for individual patients. Except in those circumstances where death is imminent (hours to days), application of epidemiologic data to individuals for prognostic purposes is flawed by a high degree of variability.

Both diagnostic precision and prognostic certainty depend on Bayesian logic (an inferential decision-making approach based on knowledge of previous events to predict future events),¹⁵ but in modern times, that is where similarities end. Diagnosis has become increasingly precise and reliable because of advances in laboratory and imaging sciences, whereas prognosis has become increasingly imprecise and uncertain. Timing and causes of death have been greatly influenced in recent decades by advances in medical therapeutics along with public health measures, improvements in applied clinical science (e.g., wound care, nutritional support), and myriad incalculable social variables. As a result, diagnostic dilemmas have become the exception, whereas prognostic dilemmas are increasingly the rule. In other words, variables and factors leading to a differential diagnosis are few and based on at-hand evidence. But the variables leading to a differential prognosis are many, based not just on immediately apparent biomedical status (including diagnosis, disease stage and severity, symptom burden, comorbidities) but on what may or may not happen in the future—only some of which can be controlled. Also, biological factors converge with potent sociological and psychological biasing factors in unpredictable and variable ways. For instance, seminal work by Christakis and others^{22–24} has shown that doctors are systematically overoptimistic in assessing life expectancy. Other than when signs of imminent death are present, prognostication for any specific individual beyond a matter of hours to days is fraught with error.

These distinctions are important because the norms of medicine and health care overall—including insurance coverage determinations for therapeutic interventions—have been established for, and are largely driven by, diagnosis. Payment for treatment is typically approved or not based on the indications for that treatment, which is primarily a function of diagnosis. Context matters, but it is a secondary consideration, once diagnosis has been established. For instance, a cataract extraction and intraocular lens implant would never be indicated for someone who does not have cataracts. On the other hand, once that diagnosis is made, the question then becomes whether the individual will benefit from the treatment, the risks involved, and so forth. If the

procedure is performed in good faith, meaning that there was a sufficient effort to make an accurate diagnosis using accepted criteria (examination findings and objective measures) in a patient who is expected to have improved vision because of the therapeutic intervention, and administrative functions are properly carried out (e.g., proper documentation, coding, and billing), then payment will usually ensue, even if the overall clinical outcome is not the desired one.

Extending that straightforward example, if a Medicare beneficiary is diagnosed and treated for cataracts, but then dies unexpectedly shortly after surgery from a fatal arrhythmia, never having derived benefit from the eye surgery, that procedure was still warranted and will be paid for. The surgeon will not be punished because the patient did not live long enough to enjoy improved vision. Even under circumstances of great prognostic uncertainty (e.g., a small but nevertheless potential opportunity to induce a remission in an aggressive cancer) we default to diagnosis to define treatment, which in turn drives payment for that care. The fact that more than half of patients being treated for a certain type of highly malignant solid tumor will not survive long term does not preclude treatment and payment for all similarly situated patients—because we do not know in advance which patients might benefit.

The exception to this paradigm is the MHB, because of indications (i.e., eligibility) based entirely around the highly inexact, and thus controversial, function of guessing life expectancy—a function for which there is no corroborative confirmatory test or measure other than passage of time. At inception, this was not as great a problem as it has become. When the MHB was legislated, it was largely applied to beneficiaries with cancer (about one of every four Medicare decedents per year), at a time when options for extending life were few. But during the 1980s and into the early 1990s, interest in palliative care grew rapidly, including the development of physician postgraduate fellowship training programs, medical board certification, and nursing certification. So, too, did the recognition that most Medicare beneficiaries who died (especially those without far-advanced cancer) were not receiving the benefits of hospice care. But even for patients with advanced cancer, it is increasingly difficult to provide accurate prognostic information months out from the foreboding clinical signs of imminent death.⁷ It is now as common to be surprised by a rapid demise as it is by someone hanging on for many months—and sometimes years—longer than expected.

A review of the many prognostic tools used to forecast survival among populations of patients with various conditions is beyond the scope of this article.

But suffice it to say that none of the existing methods available, when applied to the many diagnostic groups among the Medicare population who die every year, are more precise than the Palliative Performance Scale coupled with the clinical judgment of a physician who is familiar with the patient’s condition, past history, goals and values, and social support circumstances. And when studied either prospectively or retrospectively for similarly situated cohorts, predictions for life expectancy between a few months and a year or two applied to individual cases are widely variant.²⁵

Lessons Learned and a Way Forward

The dilemma experienced by patients, their well-intended referring clinicians, and hospice providers created by an inadequate scientific body of evidence coupled to an effete policy has been well summarized by D. Helen Moore²⁶ in her thesis entitled *Evaluation of the Prognostic Criteria for Medicare Hospice Eligibility*. She avers, “The tools of science, including quantitative, qualitative and analytical methods, have been applied to better understand the Medicare prognostic criteria, their validity, applied utility and patient, physician and provider impact. From the perspective of federal analysts, chart auditors need well-defined, time-efficient and nationally relevant standards to facilitate objective Medicare claims review. From a more global perspective, reliable markers of 6-month life expectancy would be undeniably valuable. A poorly designed policy, however, can result in mismanagement of thousands of patients and misallocation of millions of dollars.”

Efforts to identify consistently useful clinical measures to reduce variability in survival predictions among all advanced illness diagnoses and conditions have been unsuccessful. By now, the lesson that should have been learned from history is that the original paradigm of prognosis-driven criteria for the hospice approach to advanced illness care is intractably flawed. Prospective trials testing well-defined clinical variables, coupled with the newly imposed regulatory

construct of decline (which has no specific medical definition and so neither additive nor synergistic evidence-based predictive value), have not improved patient-centered or economic outcomes nor have they yielded better validated prognostic tools.

Concurrently, regulatory agency and payer focus on the proportionally small group of hospice patients who live more than six months on hospice ignores what congress readily recognized when enacting the MHB—some patients will live longer than six months and are still entitled to the MHB. A capitated payment structure has been used to ensure hospices would not target only those patients with an expected long length of stay, and yet CMS contractor medical review policy appears to ignore that control.

The end result of all factors discussed creates a skewed distribution of hospice admissions, with most patients dying within days to weeks (rather than weeks to months), and a smaller fraction of seemingly similar patients at the time of referral and admission living well beyond six months. With only a small percentage of all Medicare beneficiary days in the last year of life spent receiving coordinated home-based palliative care services under the aegis of the MHB, a disproportionate amount of all Medicare funds is being expended on preventable crises, disruptive transitions in care, and the provision of often undesirable and more costly therapies without appreciable benefit—or worse iatrogenic harm.

These observations and conclusions are a call to action on behalf of all Medicare beneficiaries for a change in this dysfunctional coverage paradigm, which will necessitate a remedy by the legislative and executive branches of the federal government. Although a worthy endeavor, this type of change takes time and political will. Clearly, a coordinated advanced illness interdisciplinary clinical and at-risk payment model, emulating the core clinical aspects of the MHB but guided by biomedical, psychological, and social circumstances, and rewarded for quality, would be a more rational approach, keeping with clinical realities, economic exigencies, and human needs. There are existing precedents for this type of care model as typified by managed long term services and

Table 1
Using Key Indicators of Hospice Utilization to Identify High-Integrity Hospices

Category	Measure
Fiscal accountability	Annual hospice reimbursement is under the aggregate CAP
Live discharges	1. <10% of admitted patients are discharged alive for reasons other than moving out of area or admission to a noncontracted facility before a LOS of less than 180 days 2. <20% of admitted patients are discharged alive after a LOS of 180 days or more
MHB conditions of participation: levels of care	All four levels of care are offered (per payment data)
Long LOS	PEPPER data below national 80th percentile for LOS >180 days

CAP = capitated payment for Medicare fiscal year; LOS = lengths of stay; MHB = Medicare hospice benefit; PEPPER = Program for Evaluating Payment Patterns Electronic Report.

supports programs that are being rolled out in states to serve high-risk low-income individuals.²⁷ In the meantime, a rational screening approach identifying, and rewarding, features of high-integrity hospice programs should be used (Table 1) in lieu of currently flawed methodologies. If applied by MACs, at the behest of CMS, providers and the Medicare Trust Fund will obtain much needed relief, and Medicare beneficiaries will likely receive much better end-of-life care.

Disclosures and Acknowledgments

The author is grateful for the generous and thoughtful feedback received from Malene Davis (Immediate Past CEO, Capital Caring, Washington, DC), Bill Novelli (Professor, Georgetown University, Washington, DC), Russell K. Portenoy (CMO, Metropolitan Jewish Health System, New York City), and Howard Young (Partner, Morgan Lewis & Bockius, Washington, DC). The author is on the Board of Directors of Magellan Health, a publically traded health care services corporation, for which he receives fees, stock, and usual and customary travel-related reimbursement for his service. He serves as a consultant for Capital Caring, a not-for-profit hospice and palliative care provider in the mid-Atlantic region of the U.S., for which he receives fees and usual and customary travel-related reimbursement for his service.

References

1. Fine PG, Davis M. Lessons learned from the Medicare hospice benefit for advanced illness care. *Generations: J Am Soc Aging* 2017;41:58–67.
2. Connor SR, Fine PG. Lessons learned from hospice in the United States of America. In: Hanks G, Cherny NI, Christakis NA, et al, eds. *Oxford Textbook of Palliative Medicine*, 4th ed. New York: Oxford University Press, 2010:1–22.
3. Fine PG. *The hospice companion*, 3rd ed. New York: Oxford University Press, 2017:1–17.
4. Centers for Medicare and Medicaid Services. Hospice, 2008. Available at: <https://www.cms.gov/Regulations-and-Guidance/Legislation/CFCsAndCoPs/Hospice.html>. Accessed July 10, 2018.
5. National Hospice and Palliative Care Organization. New facts and figures, 2018. Available at: <https://www.nhpc.org/press-room/press-releases/new-facts-figures-report-1>. Accessed July 10, 2018.
6. Kelly AS, Deb P, Du Q, Carlson MDA, Morrison SR. Hospice enrollment saves money for Medicare and improves care quality across a number of different lengths-of-stay. *Health Aff (Millwood)* 2013;32:552–561.
7. Temel JS, Shaw AT, Greer JA. Challenge of prognostic uncertainty in the modern era of cancer therapeutics. *J Clin Oncol* 2016;34:3605–3608.
8. Hospice facts and statistics. Hospice Foundation of America, 2006. Available at: <http://www.congressweb.com/naahc/docfiles/hospicefs06.pdf>. Accessed September 4, 2018.
9. Medicare Payment Advisory Commission, Report to the Congress, Medicare Payment Policy, Hospice Services, 2017 [Chapter 12], Tables 12–44, p. 325. Available at: http://www.medpac.gov/docs/default-source/reports/mar17_medpac_ch12.pdf?sfvrsn=0. Accessed August 12, 2018.
10. Stuart B. The NHO Medical Guidelines for Non-Cancer Disease and local medical review policy: hospice access for patients with diseases other than cancer. *Hosp J* 1999;14:139–154.
11. Centers for Medicare and Medicaid Services. Medicare utilization section, 2016. Available at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMSProgramStatistics/2013/Utilization.html#Medicare%20Hospices>. Accessed July 10, 2018.
12. Schonwetter RS, Soendker S, Perron V, et al. Review of Medicare's proposed hospice eligibility criteria for select noncancer patients. *Am J Hosp Palliat Care* 1998;15:155–158.
13. Fox E, Landrum-McNiff K, Zhong Z, et al. Evaluation of prognostic criteria for determining hospice eligibility in patients with advanced lung, heart, or liver disease. SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments. *JAMA* 1999;282:1638–1645.
14. Schonwetter RS, Han B, Small BJ, et al. Predictors of six-month survival among patients with dementia: an evaluation of hospice Medicare guidelines. *Am J Hosp Palliat Care* 2003;20:105–113.
15. Gill CJ, Sabin L, Schmid CH. Why clinicians are natural Bayesians. *BMJ* 2005;330:1080–1083.
16. Department of Health and Human Services Office of the Inspector General. Operation Restore Trust Activities, 1995. Available at: <https://oig.hhs.gov/oei/reports/oei-12-96-00020.pdf>. Accessed July 10, 2018.
17. Department of Health and Human Services Office of the Inspector General. Medicare hospice beneficiaries: services and eligibility, 1998. Available at: <https://oig.hhs.gov/oei/reports/oei-04-93-00270.pdf>. Accessed July 10, 2018.
18. Federal Register/Vol. 64, No. 192/Tuesday, October 5, 1999/Notices. Available at: <https://oig.hhs.gov/authorities/docs/hospicx.pdf>. Accessed July 10, 2018.
19. Kinzbrunner BM. Hospice: 15 years and beyond in the care of the dying. *J Palliat Med* 1998;1:127–137.
20. Simpson DA. Prognostic criteria for hospice eligibility. *JAMA* 2000;283:2527.
21. Linder JC. Hospice care in the crosshairs: the growing fraud and abuse enforcement threat to hospice providers. Available at: https://files.drinkerbiddle.com/Templates/media/files/publications/Linder_HospiceCare.pdf. Accessed July 10, 2018.
22. Smith AK, White DB, Arnold RM. Uncertainty: the other side of prognosis. *N Engl J Med* 2013;368:2448–2450.
23. Christakis NA, Lamont EB. Extent and determinants of error in doctors' prognoses in terminally ill patients: prospective cohort study. *BMJ* 2000;320:469–473.
24. Iwashyna TJ, Christakis NA. Physicians, patients, and prognosis. *West J Med* 2001;174:253–254.

25. White N, Reid F, Harris A, Harries P, Stone P. A systematic review of predictions of survival in palliative care: how accurate are clinicians and who are the experts? *PLoS One* 2016;11:e0161407.
26. Moore DH. Evaluation of the prognostic criteria for Medicare hospice eligibility. 2004. Open access: Graduate theses and dissertations. Available at: <http://scholarcommons.usf.edu/etd/1167>. Accessed July 10, 2018.
27. Centers for Medicare and Medicaid Services. Managed longterm services and supports. Available at: <https://www.medicare.gov/medicaid/managed-care/ltss/index.html>. Accessed August 9, 2018.