The Health Economics of Palliative Care

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Only a few studies have assessed the economic outcomes of palliative therapy. The major areas of interest include hospice care, the process and structure of care, symptom management, and palliative chemotherapy

We can afford to die well, but it will require coordinated care with someone in charge... An aging population that demands more treatment[1] and new technology[2] to stay alive will continue to pressure the current health-care system. As much of palliative care concerns federally funded Medicare and Medicaid, all of us have a share in this "medical commons." Currently, about 25% of Medicare dollars are spent on patients in their last 60 days of life,[3,4] and money spent for palliative care cannot be spent for prevention, screening, or other treatment.

At the same time, the quality of cancer care that we purchase is suboptimal.[5,6] Examples include studies showing that high-volume or specialty centers/providers are associated with 5% to 10% better breast cancer survival, twofold better survival for testicular cancer patients, less mortality for prostatectomy, and up to fourfold better survival for complicated cancer surgery. The Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments (SUPPORT) showed that half of all dying patients had unnecessary pain in their final days of life in academic hospitals.[7]

Poor pain relief has been found in academic practice[8] and in minority populations[9]—indeed, anywhere searched.

We have identified some important questions about economic outcomes and palliative care, which are listed in Table 1. The first question—what outcomes justify treatment—although probably the most important (and clearly the most contentious), is beyond the scope of this manuscript. The American Society of Clinical Oncology (ASCO) could not describe a minimum benefit that would justify treatment, but did state that some benefit must be demonstrable, and that cost and toxicity should be considered along with benefit.[10] We will address the other issues with data in this manuscript, based on a review of Medline from 1970 to the present and selected searches within bibliographies.

Hospice vs Nonhospice Care

Hospice has been recommended by ASCO as the most applicable model for good end-of-life care in the United States,[11] but there are few solid data that show hospice improves care or reduces costs (Table 2).[12-19] The only randomized clinical trial of hospice vs conventional care showed no important differences by any measured benchmark (pain, ability to perform activities of daily living).[15] Patients still used many hospital days (48 for control group, 51 for hospice group), but more of the hospice patients were hospitalized on the hospice unit. There was no difference in diagnostic procedures or in total costs of about $15,000 per patient.

Hospice care may be cost-saving in the last month of life.[16,17] For those who enrolled during that interval—typically, over half of Medicare patients—Medicare saved $1.26 to $1.65 for each $1 spent. Those who elected hospice tended to use more resources in the months from diagnosis until about 3 months before death, so the total disease management costs were equal.

Hospice may actually not be saving total disease management costs, but just shifting them to costs not captured by our current accounting systems. In our own study of Medicare hospice use in Virginia, matching hospice use with Medicare files, total disease management costs in the last year of life were not changed by hospice care (unpublished data, T.J. Smith et al). In the same study of hospice use in Virginia, multivariate logistic regression showed that patients who were very old, white, well-to-do, and without comorbidities more often elected hospice than those who were not (unpublished data, T.J. Smith et al). This group is also able to absorb more home care costs, out-of-pocket drug costs, and so forth. The data are consistent with an affluent group of patients using all the resources needed for treatment, then electing hospice. There are few published data on whether the poor or minorities use hospice, how much those patients will cost the system, or total...
costs.\[12\] Studies from databases of hospice use have shown similar results, with one study finding a 39% reduction in end-of-life care costs\[18\] if patients were in hospice more than 2 weeks. Conventional care was the least expensive approach when overall disease management costs were calculated, but hospital-based hospice ($2,270) and home care hospice ($2,657) were less expensive than conventional care ($6,100) in the last month of life. Not surprisingly, when full-cost accounting is done, home care provided by relatives is not much different ($4,563 for each 3-month period) than care in a nursing home or similar setting. Costs were lowest when the patient and caregiver lived in the same household.\[20,21\]

**Use of Advance Directives**

No cost savings have been associated with the use of either typical advance directives or do not resuscitate (DNR) orders done in the hospital, as shown in Table 3.\[22-24\] In one randomized study of 204 patients with life-threatening diseases, the execution of an advance directive had no significant positive or negative effect on a patient’s well-being, health status, medical treatments, or medical treatment charges.\[23\] For patients who had advanced directives prior to intervention in the SUPPORT trial, there was a 23% reduction in cost associated with advance directives\[22\] suggesting that advance directives may save money if executed early in the disease course. Nevertheless, Emmanuel and Emmanuel\[13,14\] estimated that if all Medicare recipients had advance directives and elected hospice, savings would only amount to 3%.

**Changes in Process or Structure of Care**

**Role of the Nurse**

Coordinated care with a nurse in charge of resource use has been shown to preserve palliative care quality and lower cost. A randomized clinical trial of a nurse coordinator for terminally ill patients in England maintained outcomes: Most patients still had some unrelieved symptoms, but patient and family satisfaction was helped slightly.\[25\] Total per patient costs were reduced from £8,814 to £4,414 (-41%), primarily as a result of decreased hospital days.\[26\] The US Medicare Hospice Benefit requires similar nurse coordination, team management, easy access to low per diem hospital beds for respite or temporary care, and expanded drug coverage,\[12,27\] but at present only 15% of the eligible population uses it. (For the most recent statistics, see Basic Statistics About Hospice on the National Association of Hospice Care’s website, http://www.nahc.org/Consumer/hpcstats.html.) In a Canadian study, home nursing care was associated with more patients dying at home. It is difficult to predict whether US physicians (or, for that matter, patients) would accept mandatory nurse coordination\[28\] for instance, the nurse could direct the doctor to make a home visit and be willing to lose patient control, reduce supportive care use, and lose income.

**Increased Access to Care**

The Regional Palliative Care Program (RPCP) in Alberta, Canada, increased access of terminally ill patients to palliative care with an additional four full-time physicians and nurse consult teams, 56 hospice beds at three different sites, and greater availability of home nursing care. Fees for family physician home and hospice visits were increased, and the palliative care team offered extensive patient education. On analysis, the RPCP significantly increased access to palliative care, increased family practice physician participation in palliative care, and reduced costs of care (Table 4).\[29\] Approximately 85% of patients discharged from the cancer center chose to continue care under the direction of their own family physician, with the RPCP available as needed. The authors estimated that the program saved the province a total of $2,500,000 as a result of decreased use of acute care facilities.\[29\] Our own group developed the Rural Cancer Outreach Program (RCOP) between rural hospitals and the Medical College of Virginia’s Massey Cancer Center to bring state-of-the-art cancer care to medically underserved rural patients. The key to the program is the coordination of all aspects of care by nurses at the rural centers and at Massey Cancer Center. State-of-the-art care, clinical trials, and palliative care have improved at the rural centers.\[30\] Pre- and post-RCOP financial data were collected on 1,745 cancer patients. The cost for each rural patient admitted to the Medical College of Virginia fell from $12,268 to $7,370 (-40%), compared to only a 2% decrease for all other cancer
patients—consistent with other coordinated programs.[31]

### Other Coordinated Care Approaches

The City of Hope changed the culture of pain management with enhanced institutional education programs, a highly visible and respected consultative team, and a pain resource center for nurses and families. This was associated with a decrease in admissions for pain control with marked cost savings (Table 5).[32] The study was not randomized and could not account for other significant changes such as the growth of managed care with restricted admission policies. However, a reasonable conclusion is that this program led to better pain management and probably saved money.

Coordinated ethics and intensive care unit planning for patients who are likely to die also matches resource use to care and save money. An ethicist in the surgical intensive care unit (SICU) taught the staff about issues of patient choices in dying and the ethics of futile care. For those who died, there was a decrease in length of SICU stay from 28 to 16 days and a decrease in SICU days from 2,028 to 1,003 days, far greater than was observed in other parts of the hospital; savings were estimated at $1.8 million.[33]

Similarly, Dowdy and colleagues conducted mandatory proactive ethics consultations for all patients who had been mechanically ventilated beyond 4 days. They found a reduced use of the intensive care unit due to either the discontinuation of futile care or the transfer of patients to lesser-intensity units and a decrease in costs.[34]

Coordinated care that uses a less expensive setting reduces costs. Despite higher costs for drug equipment and nursing, home narcotic infusions produced lower total costs due to fewer hospital costs.[35]

We recently started an inpatient palliative care program based on the following principles: Only expert specialized caregivers are used, care is standardized with algorithms, and a high-volume unit is employed. Preliminary analysis supports the premise that the quality of care can be maintained and that costs can be substantially reduced compared to conventional care (unpublished data, T.J. Smith et al).

### Symptom Management at End of Life

Remarkably few randomized trials of symptom control in end-of-life care have been conducted, with no large studies in the past 10 years. That said, we have enrolled 200 patients in a randomized clinical trial of comprehensive medical management vs similar management plus the use of an implantable drug delivery system (the Medtronic SynchroMed). Study patients must have unrelieved pain (analog pain scores > 5 on a 0-10 scale) despite management by a comprehensive pain management team.

As shown in Table 6, the main outcome measure is clinical success measured by ≥ 20% improvements in pain or toxicity. Secondary measures include pain control (change in analog scale), with secondary measures of quality of life (Brief Pain Inventory, SF-12 Health Survey), caregiver quality of life (Caregiver QOL Survey), and toxicity (National Cancer Institute Common Toxicity Criteria). Limited health resource utilization data are being collected to assess whether avoided hospitalizations for pain and decreased use of other resources balance the cost of the drug delivery system. At 200 patients, the study was powered to detect a 20% difference in pain control. We have already shown that (1) these patients still have scores of 7+, despite > 1,200 mg per day of morphine and three other drugs (unpublished data, T.J. Smith et al); (2) there are relatively minimal country-by-country differences in drug use (unpublished data, T.J. Smith et al); (3) patient and caregiver quality of life correlates highly with pain scores (unpublished data, G. Poole et al); and (4) even the most refractory of patients can get substantial pain relief from implantable narcotic delivery systems, with scores falling by 4/10 (unpublished data, T.J. Smith et al).

### Chemotherapy vs Best Supportive Care

Chemotherapy may be helpful for symptom relief or to prolong survival and may have acceptable cost-effectiveness ratios, but there have been substantial methodologic problems with most studies addressing the economic outcomes of such treatment in palliative care.[36,37] There are no examples of chemotherapy reducing the cost of care.

In a Canadian study,[38] chemotherapy for non-small-cell lung cancer did not increase disease management costs compared to best supportive care, because it prevented hospitalizations late in the disease course. The cost-effectiveness ratios ranged from -$8,000 (cost saving) to +$20,000 (Canadian dollars) for each additional year of life (Table 7).[37-47] Chemotherapy with cisplatin and
vinorelbine, compared to vinorelbine alone or cisplatin and vindesine, added substantial clinical benefits[39] at a reasonable cost-effectiveness of $15,000 to $17,000 per year of life.[40] Chemotherapy in combination with radiation and/or surgery for stage IIIA/IIIB non-small-cell lung cancer, in comparison to treatment without chemotherapy, would improve survival at a cost of $3,348 to $14,958 (Canadian dollars) per year of life saved.[41]

Fluorouracil chemotherapy for gastrointestinal cancer patients randomized to first-line chemotherapy vs best supportive care (that could include later chemotherapy) showed benefit at acceptable cost-effectiveness ratios.[42] For the whole group, chemotherapy enhanced survival by about 5 months at a cost of about $20,000 per year of life gained. Mitoxantrone added a small clinical benefit in terms of pain relief and symptom control in 23 of 80 patients with metastatic prostate cancer but did not alter survival when compared to prednisone alone.[43] Although initial drug costs were higher, total disease costs were lower in the group that received mitoxantrone,[44] so chemotherapy palliation could be accomplished at no additional cost. There have been no studies on the effectiveness or cost-effectiveness of chemotherapy for metastatic breast cancer compared to best supportive care. Pamidronate (Aredia) reduces the rate of skeletal complications, but the cost-effectiveness is far outside of the accepted range.[45] However, it is widely used due to fear of bone complications, patient demand, low rate of side effects, high reimbursement for the practice, and lack of incentives to not use.

Some areas that are ripe for study include such expensive interventions as trastuzumab (Herceptin), rituximab (Rituxan), erythropoietin (Epogen, Procrit), and other growth factors. All these agents have usefulness in cancer treatment and symptom control, but all have high prices—often $1,000 per week or more.

Reducing Costs in Palliative Care

There are concrete steps that could be taken to reduce costs while maintaining quality of palliative care. Coordination of palliative care produces major cost savings of about 40% but will require sharing of provider autonomy to a nurse or other trained manager. Advance directives produce major cost savings if prepared well before the terminal hospitalization, not in the last weeks of life (as is standard in the United States). Hospice care produces only minor cost savings as performed in the United States, where hospice referrals are made only when death is imminent. In addition, ethical interventions focused on futile care appear to produce significant cost savings by shifting the site of care from the intensive care unit to other areas. Chemotherapy for some cancers (non-small-cell lung cancer, prostate cancer, and gastrointestinal cancer) is reasonably effective and has acceptable cost-effectiveness ratios; this does not apply to any other expensive regimen that has not been formally evaluated.

Economic outcomes will become increasingly important for all types of health care, including palliative care. The practice of medicine now involves nonmedical issues such as cost control, oversight and audit, utilization review, decreasing liability risk, and so forth[48] considerations that are not inherently unethical. Medicine has always been charged with promoting health and relieving discomfort. Cost control through disease management may actually promote these goals if it makes more care available, or makes it more universally accessible.

There is no agreement on what to do with the limited cost-effectiveness data. Canadian guidelines for funding have been widely ignored in the United States but are at least starting points for discussion. These guidelines include the following recommendations: (1) Adopt treatments that work better and are less expensive, (2) accept treatments with cost-effectiveness ratios < $20,000 per additional year of life, with the recognition that their use will be accompanied by the added cost of other resources, (3) examine on a case-by-case basis treatments with cost-effectiveness ratios from $20,000 to $100,000 per additional year of life, and (4) reject treatments with cost-effectiveness ratios > $100,000 per year of life saved. These strategies may be valid in a system where all resources are shared but may not apply to other health-care systems.[50] If we followed these guidelines, such popular items as mammography for women under age 50, autologous blood transfusions, pamidronate therapy, and nearly all nth-line chemotherapy would not be allowed.

Conclusions

In summary, coordinated care of the dying patient has the potential to cut costs by 40%. Advance directives will save costs if and only if they are applied early in the disease course to allow patients to plan their end of life. Hospice care saves costs in the last month of life by avoiding hospitalization
but does not change total disease management costs much, if at all. Significant barriers to these models of coordinated care include delayed patient acceptance of death and reluctance on the part of the physician to lose control of management and to lose practice income if less expensive supportive care is used.

References:


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