



AN INTEGRATED PALLIATIVE APPROACH TO CARE • DES SOINS QUI INTÈGRENT L'APPROCHE PALLIATIVE



## COST-EFFECTIVENESS OF PALLIATIVE CARE: A REVIEW OF THE LITERATURE

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Canadian Hospice Palliative Care Association  
Association canadienne de soins palliatifs



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## ABBREVIATIONS

COPD	Chronic Obstructive Pulmonary Disease
CHPCA	Canadian Hospice Palliative Care Association
DNR	Do Not Resuscitate
ICU	Intensive Care Unit
IPM	Inpatient Palliative Medicine
LOS	Length of Stay
MS	Multiple Sclerosis
PCU	Palliative Care Unit
QALY	Quality-Adjusted Life-Years
RCT	Randomized Controlled Trial
U.K.	United Kingdom
U.S.	United States
VA	Veterans' Affairs





## EXECUTIVE SUMMARY

In the current environment of rising health care costs and concerns about the sustainability of publicly funded health care, policy makers are paying more attention to the costs associated with the last year of life.

### The cost of dying is high

The cost of dying in Canada ranges from as low as \$10,000 for a sudden death to between \$30,000 and \$40,000 for someone with a terminal disease such as cancer or chronic obstructive pulmonary disease. The cost of dying varies not only by cause but by where people die: on average it costs \$36,000 to die in a chronic care facility, compared to \$16,000 to die at home. The U.S. estimates that: the sickest 10% of Medicare beneficiaries account for close to 60% of program spending; and about 30% of all health care costs for those age 65 and over occur during the last year of life.

Most of these end-of-life costs are absorbed by the health care system, although families also experience substantive caregiving and out-of-pocket costs. Controlling or reducing the cost of dying could benefit the health care system, families and individuals. It could relieve pressure on health care resources and make it possible to re-allocate savings to other care.

### Hospice palliative care services can reduce the costs of dying and improve patient care

According to evidence from the U.S., the U.K., and Canada, hospice palliative care services can significantly reduce the health care costs of patients who are dying. They can reduce hospital admissions, length of hospital stays, re-admissions, visits to intensive care units (ICUs), and inappropriate diagnostics or interventions. Hospice palliative care also improves patient care: it is associated with improved patient and caregiver satisfaction, better symptom control and greater likelihood of the person dying in the setting he or she prefers.

Most research on the economics of hospice palliative care has focused on hospital-based programs. Despite some methodological limitations, it appears that, compared to usual acute care, hospital-based hospice palliative care may save the health care system approximately \$7,000 to \$8,000 per patient. According to an Ontario study, shifting 10% of patients who are nearing end of life from acute to hospice palliative care could save the health care system \$9 million. There is also evidence of the economic benefits of home-based hospice palliative care. One systematic review and several small studies of home-based hospice palliative care services showed

cost savings ranging from 33% to 68% of the cost of usual home care. In Spain, a combination of hospital- and home-based hospice palliative care services has been credited with saving the country's health care system several million Euros (€) each year.

Unfortunately, few studies published to date have measured informal caregiving or out-of-pocket costs; those that do suggest that, compared to usual care, hospice palliative care may have only limited impact on families' costs.

### **More information is needed to compare different models/settings for hospice palliative care**

Few studies have looked at the cost-effectiveness of other community-based hospice palliative care service delivery models – such as day care, care coordination by community nurses, early consultation and respite care – or of stand-alone hospice facilities.

There is also little evidence on which models or approaches to hospice palliative care (e.g., hospital, home, hospice or other community-based) are preferable, particularly in the Canadian setting. Although hospital-based hospice palliative care units are cost-effective, communities may need a certain number of deaths to ensure the economies of scale required to operate a dedicated hospital unit. This model may not be practical outside large urban centres.

### **An integrated palliative approach to care may be more appropriate for Canada**

A more cost-efficient strategy may be to integrate a palliative approach to care throughout the health care system. Such an approach would ensure that clinicians in all settings are able to: recognize when patients and families can benefit from hospice palliative interventions; provide appropriate services; and access support and advice from palliative care specialist physicians and/or nurses. This type of low-cost strategy could make it possible for the health care system to respond to patient and family needs in the home and local community, avoiding costly transfers to large urban hospitals and potentially unnecessary or unwanted curative interventions. This approach would mean not only “the right care at the right time” but also care in the settings that most patients prefer: in the home and community.

## I. MAKING THE ECONOMIC CASE FOR HOSPICE PALLIATIVE CARE

Concerned about escalating health care costs, health care systems across Canada are paying more attention to the amount spent on patients during the last months of life. In most western nations, people's health care costs increase dramatically in their last year. In the U.S., for example, Medicare spends 27% to 30% of its total budget on care for people in the last year of life. Medicare costs for people who die are almost three times as high (276% higher) than the cost of care for people of the same age who are alive. {Davis et al., 2005} In a Saskatchewan study, the average monthly per person cost to the health care system increased from \$1,373 12 months before death to \$7,030 for the last 30 days; when user fees were included, the average costs were \$1,641 and \$7,420 respectively. {Hollander, 2009}

One of the key cost drivers is the type of care that people receive at end of life. For example, up to 20% of all deaths in the U.S. occur during or shortly after a stay in resource-demanding Intensive Care Units (ICUs). {National Institutes of Health, 2010} A Canadian study found that the cost of care for patients with terminal illnesses increased from the fifth to last month of life, due largely to the cost of inpatient care. {Dumont et al., 2010}

Hospice palliative care is a “combination of active and compassionate therapies intended to comfort and support persons and families who are living with, or dying from, a progressive life-limiting illness, or are bereaved”.

Canadian Hospice Palliative Care Association

The aging of our population and the growing number of Canadians with chronic life-limiting health conditions such as heart failure, cancer, chronic obstructive pulmonary disease (COPD), neurological disorders and multiple sclerosis (MS) are putting pressure on our health care systems. Integrating a hospice palliative care

approach for critically ill patients – an approach that focuses on symptom management rather than curative interventions – could cut end-of-life health care costs by reducing the use of unnecessary or avoidable acute care services and interventions.

Reports submitted to the governments of Canada {Albrecht et al., 2011; Hollander & Chappell, 2002; The Ontario Association of Community Care Access Centres, 2010}, Australia {Palliative Care Australia, 2012; Victorian Government Department of Human Services, 2007}, the U.K. {Hatzianandreu et al., 2008; Hugodot, 2007} and the U.S. {Almgren, n.d.; Miller et al., 2002; National Priorities Partnership, 2008} call for increased funding for and access to hospice palliative care. Most reports stress the potential cost savings or cost avoidance for the health care system. However, in addition to the economic arguments for better access to hospice palliative care {Meier, 2011}, there is also a growing consumer demand for more appropriate care at end of life:

Armed with unprecedented access to medical information, a more knowledgeable and assertive patient population has emerged in the 21st century to institute its own standards of what constitutes quality health care. In terms of end of life care, this has meant recognition that the emotional needs of the dying have been largely underserved by the current American medical model. Patients and their families are no longer willing to accept the traditional medical perspective of death as failure and have numerous international

palliative care models that serve as benchmarks of success when it comes to quality of dying. {Falls, 2009}

According to a World Health Organization report, the issue is not the need for more research on palliative care practices but rather the ability to implement what is known to address large and growing unmet needs. {Davies, 2004} However, based on a special report by the Economist Intelligence Unit, even if hospice palliative care improves quality and offers efficiencies, improving access will be a challenge. Meeting the needs of the growing numbers of people who could benefit from a palliative approach could significantly increase the percentage of overall health care budgets spent on hospice palliative care. {Economist Intelligence Unit, 2010} Before making these investments, decision makers will likely want evidence that they will, in fact, be cost effective. Given the challenges of allocating limited health resources when both need and consumer demand are growing {Bruner, 1998; Haycox, 2009}, health systems need a robust evidence base, including methodologically strong economic analyses, to help guide decisions. {Bruner, 1998; Harding et al., 2009}

This paper summarizes the evidence on the cost-effectiveness and cost-efficiency of hospice palliative care.

## Methodology

The literature search focused on articles or reports of the cost-effectiveness of hospice palliative care, as expressed in costs avoided or monies saved. Articles that focused on the cost-effectiveness of specific treatments for specific conditions were examined but generally excluded as 1) treatment costs can vary over time, 2) cost is typically not the sole reason a treatment is utilized, and 3) treatment options change over time.

A literature search was conducted using six methods:

- 1) Searches of Medlines using keywords (palliative, cost-effectiveness, economic analysis, costs) and the MESH term "palliative care/economics." Searches were restricted to English language publications involving humans. The search using the MESH term initially produced a listing of 564 publications; restricting the search to meta-analyses, systematic reviews, reviews, comparative studies, randomized control trials (RCTs), evaluation studies, technical reports and validation studies reduced the number of publications to 124.
- 2) Where Pub Med produced a relevant report, clicking on the "similar" link to find other articles (some of which were not included in the original list of retrieved publications).
- 3) A search using the Web of Knowledge database using the keywords "palliative" and "cost-effectiveness."
- 4) Using Google and Google Scholar to search for non-journal reports and studies. This "grey literature" included government reports and reports by not-for-profit and advocacy groups.
- 5) Hand searching the references of key publications. {Fassbender et al., 2009; Gomez-Batiste et al., 2006; Meier, 2011; Morrison et al., 2008}
- 6) A search of the Cochrane Collaboration library of reviews.

Additional articles were suggested by reviewers of the first draft of the paper.



The primary objective of the review was to obtain sources that addressed the cost-effectiveness of palliative care and provided estimates of costs and benefits in monetary units. However, hand searching also recovered some articles that, although they did not provide cost or dollar estimates, reported key findings on resource utilization essential in economic modeling. Editorials and letters to the editor were also retrieved if they addressed the issue of the cost-effectiveness of palliative hospice care, although they represent a very low level of evidence as traditionally defined in evidence-based analyses. {McKibbin et al., 1999}

The search of the Cochrane Collaboration library found that, although a number of reviews have addressed palliative therapies or treatment options, only one looked at palliative care in the broader sense. This review looked at three studies (all from the U.S.) that examined outcome indicators. Although two of the studies found palliative care improved some aspects of delivery of palliative care in residential care, there was no economic analysis. {Hall et al., 2011}

**Literature retrieved**

Sixty-six citations were retrieved from the Medlines searches, of which ten were short editorials or letters to the editor. The search using Web of Knowledge produced an additional nine studies not identified through Medlines. Hand searching and the Google searches identified another 47 publications, of which 15 were grey literature reports and 32 journal articles. As noted, additional references were supplied by the reviewers. A table summarizing key points from all retrieved articles, in alphabetical order, is provided in the Appendix. Please note that not all articles retrieved are cited in the body of this report.

**Understanding the Limitations of Economic Analyses of Hospice Palliative Care**

A number of types of economic evaluations or analyses are used in health care, each with different characteristics (Figure 1). There are four types of full economic evaluations: cost-minimization, cost-effectiveness, cost-utility and cost-benefit analyses (see next page). {Drummond et al., 1987}

Is there a comparison of $\geq$ alternatives?	Are both consequences (outputs) and costs (inputs) examined?		
NO	NO: PARTIAL EVALUATIONS		YES
	<i>Outputs</i>	<i>Inputs</i>	
	Examines only consequences: outcomes description	Examines only costs: Cost description	PARTIAL EVALUATION: Cost-outcome description of a single treatment/program
YES	Efficacy or effectiveness evaluation of different treatments	Cost analysis (only captures the costs of alternative treatments)	FULL ECONOMIC EVALUATION (captures both costs & outcomes of alternative treatments/programs) <ul style="list-style-type: none"> <li>• Cost-minimization</li> <li>• Cost-effectiveness</li> <li>• Cost-utility</li> <li>• Cost-benefit</li> </ul>

Figure 1: Types of health care economic evaluations. Adapted from {Drummond et al., 1987}

### DEFINITIONS OF FULL ECONOMIC EVALUATIONS

**Cost-minimization:** a comparison to identify, for the same (one) outcome, the treatment that produces the same outcome at the lowest cost

**Cost-effectiveness:** comparison of the costs of alternative treatments relative to the amount of change in a single, common effect measured in naturally-occurring units (e.g., of year of life gained, change in pain score, change in number of hospital stays). Extra cost associated with per-unit gain may need to meet or exceed decision makers' willingness to pay in order to justify the treatment's use.

**Cost-benefit:** a measure of both the benefits of a treatment measured in dollars (e.g., value of days of hospitalization avoided) and treatment costs, measured in the same currency

**Cost-utility:** measurement of the costs of a treatment /program in dollars and the value or worth (utility) it produces, typically measured by number of healthy days or quality-adjusted life-years (QALY); utility can be measured from the perspective of society or the individual

Adapted from {Drummond et al, 1987} and {Hoch, 2009}

It can be challenging to identify and accurately measure all relevant costs and consequences of different services or programs. As Drummond et al. (1987) noted economic evaluations "do not usually incorporate the importance of the distribution of costs and consequences into the analysis" (p. 33). In the case of hospice palliative care, where the recipients are a vulnerable group, an economic evaluation may not capture the social desirability of the service or program.

True cost-effectiveness evaluations of hospice palliative care may be relatively rare, due in part to the complexities of estimating costs and benefits. {Boldy, 1989; Boni-Saenz et al., 2005} For example, a 2003 review of economic evaluations of specialist cancer and palliative nursing found most studies considered a wide range of outcomes but only a few types of costs; as a result they were largely incapable of estimating cost-effectiveness. {Douglas et al., 2003} Other issues in economic analyses of hospice palliative care include the difficulty in: linking the cost perspectives used (e.g., health care system or individual) to relevant decision-making levels; identifying all types of costs, including opportunity costs; and determining what type of evaluation may be appropriate in different situations. {Gomes et al., 2009} Cost-utility analysis can also be problematic, as the intent of hospice palliative care – improved quality of the death experience – may be incompatible with how QALY is estimated (i.e., maximization of healthy or quality-adjusted life-years). {Hughes, 2005; Yang & Mahon, Med Health Care Philos, 2011} As a result, alternative forms of economic evaluations, such as cost-benefit analyses or cost analyses {Pronovost & Angus, 2001} or the development of new QALY or outcome measures {Currow et al., 2011; Yang & Mahon, Journal of Palliative Medicine, 2011} may be needed. Nevertheless, economic analyses are essential in advocating for hospice palliative services, particularly with governments {Hughes-Hallett et al., 2011; Murray, 2009}, even though they may not be able to incorporate or reflect social desirability.

## TERMINOLOGY

The Canadian Hospice Palliative Care Association (CHPCA) defines hospice palliative care as a “combination of active and compassionate therapies intended to comfort and support persons and families who are living with, or dying from, a progressive life-limiting illness, or are bereaved”. {Canadian Hospice Palliative Care Association Nursing Standards Committee, 2009} The CHPCA definition of hospice palliative care is consistent with the World Health Organization’s definition of palliative care.

Although the CHPCA uses the term hospice palliative care, the understanding of what constitutes “hospice” or “palliative” may vary in different parts of Canada and in other parts of the world. In Europe and the U.K., there is considerable agreement on the meaning of palliative care but definitions of hospice care tend to be more diverse. However, it is generally accepted that the underlying philosophies of care, as well as definitions used in the literature, overlap to a large extent; as a result, the term “palliative” is often used to refer to both palliative and hospice care. {Radbruch & Payne, 2009}

In the U.S., due to the structure of Medicare Hospice Benefits, the distinction between “hospice” and “palliative” is more complex. The Medicare Hospice Benefits Act stipulates that hospice benefits are only available to patients with a life expectancy of no more than six months and excludes the delivery of any “curative” treatment. {Penrod et al, 2010} As a result, the term “hospice” is used to refer to palliative services for patients at end of life. Such care may be delivered in a number of different settings: the home, nursing home, specialty hospice facilities, or hospital units. {Villet-Lagomarsino, 2012; National Hospice and Palliative Care Organization, 2012} In contrast, the term “palliative” may be used to refer to programs or services with no restriction on the length of service. Palliative care teams in the U.S. tend to be located in hospitals, where the patient initially received treatment, although services may be delivered in the home or in extended care facilities or nursing homes associated with a palliative care team. {Villet-Lagomarsino, 2012} Whether referred to as “hospice” or “palliative,” however, services tend to be similar, with an emphasis on holistic medical care, symptom management, and emotional and spiritual support. {National Hospice and Palliative Care Organization, 2012}

## II. THE HIGH COST OF DYING

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### The cost of dying in Canada ranges from about \$10,000 to \$40,000

According to Fassbender's analysis of data from Alberta, the cost of dying ranges from \$10,223 for sudden death to \$36,652 for terminal illnesses including cancer and \$39,937 for organ failure. {Fassbender et al., 2009} Up to 70% of the costs for terminal illnesses are due to hospitalizations. {Fassbender et al., 2009} In Saskatchewan, the average monthly cost per person for the government-supported health care system increased dramatically during the last year of life, from \$1,373 (in 2003/04 Canadian dollars) during the 12th month before death to \$7,030 during the last 30 days. {Hollander, 2009} Average costs for the last year of life were \$28,649 for males and \$35,306 for females; the difference may reflect the longer average lifespan of women and the higher proportion of women who live in long-term care facilities. {Hollander, 2009}

Adults with cancer make up a large proportion of end-of-life patients. In a review of Ontario adult cancer patients who died between 2002 and 2003, the average per patient cost for end-of-life care was about \$25,000 and the annual total burden for the health care system reached \$544 million. {Walker et al., 2011} Costs varied by the type of cancer and location at time of death: they were highest for those who died in chronic care facilities (\$36,119) and lowest for those dying at home (\$15,866) or in emergency departments (\$13,586). {Walker et al., 2011}

According to U.S. analyses, medical care during the last year of life consumes ten per cent of the health care budget, rising to between 27% and 30% for those age 65 and over. {Shugarman et al., 2009} Approximately a quarter of all U.S. deaths occur in long-term care settings and this proportion is expected to increase to 40% by 2040. {National Institutes of Health, 2010} Up to 20% of all deaths in the U.S. occur during or shortly after treatment in an ICU {National Institutes of Health, 2010}, an extremely resource-intensive form of care. It has been estimated that the sickest 10% of Medicare beneficiaries account for about 57% of total program spending. {Meier, 2011} These "sickest of the sick" include the elderly, people with comorbidities, and people with terminal diseases. Across all causes of mortality, average spending during the last year of life in the U.S. was approximately \$28,000 {Shugarman et al., 2009} — similar to the amounts reported in Saskatchewan {Hollander, 2009} and Alberta. {Fassbender et al., 2009} U.S. data reported spending to be slightly lower for cardiovascular diseases (e.g., approximately \$24,000) but higher for cancer (\$33,000) and COPD (\$35,200). {Shugarman et al., 2009}

### Three-quarters of end-of-life costs are for acute care services

In the Ontario study, almost three-quarters (72%) of end-of-life health care costs were for acute care services excluding ICU stays. Of the \$25,000 average per patient cost, \$1,232 were non-hospital health insurance costs and from \$1,126 to \$2,654 were for prescription medications costs (depending on the type of cancer). {Walker et al., 2011} Studies in other jurisdictions also reported that hospitalizations account for the majority of palliative care costs. {Simoens et al., Journal of Pain and Symptom Management, 2010} In the U.S., end-of-life costs are strongly influenced by hospitalizations. One study found that 18% of Medicare beneficiaries admitted to hospital are readmitted within 30 days, and the rate increases when comorbidities are present.

{New Courtland Center for Transition and Health, 2008-9} This “churning” of patients is thought to be responsible for \$15 billion in health care spending every year. {New Courtland Center for Transition and Health, 2008-9}

## Families also face significant costs

Guerrier et al.’s 2010 study of ambulatory and home-based palliative care at one centre in Toronto reported a total mean monthly cost of about \$25,000. This high cost was due in large part to the detailed accounting of caregiver’s lost wages and leisure. These costs made up \$17,453 – or more than two-thirds — of the \$25,000 monthly total. Other costs included \$6,400 per month per patient in health care system costs, \$172 in third-party insurer costs, and \$698 in patient or family out-of-pocket expenses. {Guerrier et al., 2010} This was one of few studies detailing informal caregiving costs. Its findings suggest that families and caregivers may be assuming a large proportion of the burden associated with end-of-life care.

## High cost traditional care may not be optimal care

The cost of end-of-life care tends to be high, particularly for patients with progressive, terminal diseases. The high cost of care is not surprising: such patients are extremely ill and require a substantive level of care. Costs are even higher when these patients receive active, “curative” interventions. However, not all patients benefit from this type of treatment.

Traditional “active” models of health care often do not satisfy the needs of people who are dying and their families. They may not be good at ensuring optimal management of symptoms or meeting patients’ and families’ emotional and psychological needs. For some, an alternative paradigm of care – hospice palliative care – may be more appropriate. The 1997 landmark study by the Institute of Medicine (IOM), *Approaching Death: Improving Care at the End of Life* {Committee on Care at the End of Life, 1997} noted: “people – not diseases or technologies – are the central concern of health care and people are much more than their illnesses” (pg. 51). Attention needs to be paid to the prevention and relief of the physical, emotional and spiritual suffering of patients and those close to them. {Committee on Care at the End of Life, 1997} A subsequent IOM report on cancer care found that, despite advances in the development of palliative care models, considerable inadequacies and inequities remained in meeting patients’ and their families’ multi-faceted needs. {Foley & Gelband, 2001} The report concluded that multi-sectorial action was required to expand accessibility to, and the quality of, palliative care. {Foley & Gelband, 2001}

### III. THE COST EFFECTIVENESS OF HOSPICE PALLIATIVE CARE

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Hospice palliative care programs “have been shown to increase value by both improving quality and reducing costs of care for the sickest and most complex patients”. {Meier, 2011} Although the costs, cost savings and benefits of hospice palliative care have been studied, there have been few full economic evaluations. The following is a summary of the literature on the cost-effectiveness of hospice palliative care service provided in different settings.

#### Inpatient and Hospital-based Programs

**Studies comparing hospital palliative care with usual hospital care found that hospital-based palliative care units or teams reduced hospital costs by \$7,000 to \$8,000 per patient.**

Studies in different jurisdictions compared the cost of palliative care units (PCUs) or in-patient palliative care teams with usual care {Adler et al., 2009; Bendaly et al., 2008; Davis et al., 2005; Elsayem et al., 2004; Morrison et al., 2011; Simoens et al., Journal of Palliative Medicine, 2010; Smith & Cassell, 2009; Taylor, 2009} and only two failed to find reductions in the cost of end-of-life care. Some discussed benefits {Penrod et al., 2006; Penrod et al., 2010}, described program costs {Connor, 2009; Jennings et al., 2011; Ostgathe et al., 2008; Tibi-Levy et al., 2006}, projected program cost savings {Morrison, 2008; Stephens, 2008}, or described outcomes {Back et al., 2005; Brody et al., 2010; Hearn et al., 1998}. For example, Hearn and Higginson focused largely on outcomes. Their analysis showed that multiprofessional palliative care teams increased time spent at home, patient and caregiver satisfaction, symptom control and the likelihood of dying in one’s preferred location. {Hearn & Higginson, 1998} Although they concluded that multiprofessional teams reduce the number of inpatient hospital days and, as a result, overall health care costs, they did not use this information to estimate cost-effectiveness or cost-benefit. {Hearn & Higginson, 1998}

**Hospital-based palliative care reduces the cost of end-of-life care by 50% or more, primarily by reducing the number of ICU admissions, diagnostic testing, interventional procedures and overall hospital length of stay.**

A report by the Hospice Friendly Hospitals Programme {Hugodot, 2007}, focused on cost-effectiveness. A systematic review of 65 articles (mostly American), it found most studies looked primarily at the economic outcomes of hospice palliative care in general and few estimated the cost-effectiveness of hospital-based palliative care compared to traditional care. The most common metric for gauging outcomes was hospital length of stay (LOS), despite the fact that costs during the last day of a hospital stay may be only a small proportion of the total cost of care (e.g., reducing LOS by one day reduced total cost of care by only 3%). The majority (70%) of the cost-avoiding effect of hospice palliative care was due to its ability to reduce utilization of diagnostic testing and interventional procedures. Advanced directives and early Do Not Resuscitate (DNR) orders were also been shown to help reduce health care expenditures. Studies put the cost savings associated with inpatient palliative hospice care at about 50% (ranging from 40% to 70%). Savings “more than equaled the cost of running the service” but there was no calculation of cost per unit of benefit (e.g., of number of ICU stays or days of hospital care avoided). {Hugodot, 2007}

### Better communications leads to fewer unnecessary procedures and greater patient satisfaction

Much of the literature on the economics of hospital-based hospice palliative care has been generally positive. Adler et al. (2009) found that hospice palliative care reduces health care expenditures by up to 40% during the last month of life and up to 17% during the last six months, for an average of \$2,309 per patient. The decrease was attributed to the ability of inpatient palliative care consultations to decrease the number of procedures performed near the end of life, overall hospital LOS, ICU LOS, and other components such as pharmacy, imaging and patient care. {Adler et al., 2009} In a 2005 comparison of palliative and non-palliative patients in one U.S. hospital, consultation with a palliative care team reduced hospital care costs by approximately \$7,000 (\$35,824 vs. \$42,731,  $p < .001$ ), even though the hospice palliative care patients had slightly longer average length of stay. {Bendaly et al., 2008} The finding of a slightly longer LOS is not typical. Most studies found that palliative care team consultations reduce inpatient hospital days. {Hearn & Higginson, 1998} Length of stay may be an important factor in determining the economic impact of an inpatient hospice palliative care unit. A 2002 analysis of administrative data from the Cleveland Clinic palliative medicine unit in the late 1990s found that revenues exceeded direct costs as long as the mean length of stay was less than ten days. {Davis et al., 2002}

In a 2006 retrospective observational study of costs at two urban U.S. Veteran Affairs (VA) hospitals, dying patients who received hospice palliative care were 42% (95% CI 31-56%) less likely to be admitted to ICU and their total direct per day costs were \$239 (95% CI \$122-\$388) lower. {Penrod et al., 2006} Their patient and family outcomes were also better, due in part to improved communication about goals of care among patients, families and treating physicians; however, there was no attempt to quantify these benefits. A subsequent and larger study by the same team in five VA hospitals found no significant difference in average number of hospitalizations between palliative and non-palliative patients; in fact, palliative patients actually had a longer average hospital and ICU LOS. {Penrod et al., 2010} However, a statistically significant smaller proportion of palliative care patients entered ICUs. When adjusted for disease, demographics and treatment factors, total daily direct hospital costs for palliative care patients compared to non-palliative patients were \$464 lower (95% CI \$413-515), pharmacy costs were \$51 lower (95% CI \$43-60), nursing costs \$182 lower (96% CI \$164-201), laboratory costs \$49 lower (95% CI \$43-57) and radiology costs \$11 lower (95% CI \$3-19). {Penrod et al., 2010}

A 2003 study of a high-volume specialist palliative care unit (PCU) and team in one U.S. hospital reported that, compared to matched controls, the unit reduced overall daily charges by 66%. {Smith et al., 2003} Of those who died, PCU patients had 59% lower daily charges (approximately \$2,172 vs. \$5,304,  $p = .005$ ), 56% lower direct costs (\$632 vs. \$1,441,  $p = .004$ ), and 57% lower total costs (\$1,095 vs. \$2,538,  $p = .009$ ). The PCU care also reduced the use of unnecessary or unhelpful interventions, such as oxygen in the absence of dyspnea. The review focused solely on costs, and did not formally measure indicators of quality of care or patient and/or family satisfaction. {Smith et al., 2003}

A 2005 study of data collected at one American inpatient palliative care consultation service between 2000 and 2002 found that the median number of ancillary tests and ventilator charges among patients who had >1 ventilator charge was higher before than after consultation. {O'Mahony et al., 2005} Among those who were ventilated, palliative consultation reduced ventilator charges from \$5,451 (pre-consultation) to \$2,080 (post-consultation;  $p < .0001$ ). A matched case control study of 160 patients also reported a difference in diagnostic imaging charges between those receiving palliative consultation compared to controls (net difference of \$696.05 in favour of intervention,  $p = .054$ ) as well as in laboratory services (net difference in favour of consultation of \$2,005.56,  $p = .008$ ). {O'Mahony et al., 2005} In another American study of palliative care patients and matched cohorts from a single academic medical centre, the mean cost per admission was 19.2% lower and the mean daily cost was 14.5% lower (\$2,022 vs. \$2,315,  $p < .01$ ) for those receiving palliative care (\$20,751 vs. \$24,725,  $p < .0001$ ). {Ciemins et al., 2007} For this hospital, authors estimated the reduction in mean daily costs and LOS totaled \$2.2 million per year in avoided costs. {Ciemins et al., 2007}

Other analyses suggest that cost savings may depend on patient outcome. An analysis of Medicare spending at four New York State hospitals from 2004 to 2007 found that patients who received consultation from a palliative care team had hospital costs about \$6,900 less than a matched group of control patients given usual care. {Morrison et al., 2011} The size of the reduction varied: it was greater for patients who died in hospital (\$7,563) than those discharged alive (\$4,098). {Morrison et al., 2011}

### Hospice palliative care reduces ICU use and costs

According to research at eight U.S. hospitals between 2002 and 2004, palliative care consultations reduced direct costs (\$1,696 per admission,  $p = .004$ ), laboratory costs (\$424,  $p < .001$ ), and ICU costs (\$5,178,  $p < .001$ ). {Morrison et al., 2008} A subsequent study by the same team on the effect of palliative care during hospitalization on ICU utilization {Smith & Cassel, 2009} found that palliative care reduced ICU direct costs from \$6,974 (under usual care) to \$1,726 ( $p < .001$ ) for people discharged alive; and from \$15,531 to \$7,755 ( $p = .045$ ) for those who died in hospital. Patients who received a palliative care consultation were less likely to die in ICU (4%) than those who did not (18%). {Smith & Cassel, 2009} The cost per day to care for patients hospitalized in the last 20 days prior to death was significantly lower when they were treated in a PCU than in an ICU or other unit. {White et al., 2006} Even in a tertiary-care academic hospital, the cost of care for those admitted to the inpatient palliative medicine (IPM) unit was \$7,800 lower than those admitted to acute care units in similar hospitals, despite equivalent severity of illness and the longer length of stay and higher mortality of IPM patients. {Davis et al., 2005}

Although most research on palliative care has been conducted in the U.S., other jurisdictions have also documented benefits. In a South Korean study, terminally ill cancer patients in a PCU were more likely than cancer patients treated in other units to have DNR orders ( $p < .001$ ) and to receive palliative chemotherapy ( $p = .002$ ); they were also less likely to be admitted to ICU ( $p < .001$ ), put on a ventilator ( $p < .001$ ) or receive hemodialysis ( $p < .001$ ). {Jung et al., 2012} For the six month prior to death, total medical cost per patient was \$21,591 for PCU patients and \$29,577 for those not



treated in the PCU — a difference of \$7,986 ( $p < .001$ ). In general, medical care costs increase as time to death decreases. {Hollander, 2009} In the South Korean study, however, monthly costs increased less for PCU patients: from less than \$2,000 per patient six months before death to approximately \$9,000/month for PCU patients in the last month of life compared to \$13,400/month during the last month for non-PCU patients. {Jung et al., 2012}

### **Hospital-based palliative consultation increases referrals to hospice facilities**

In addition to reducing hospital expenditures, hospital-based palliative consultation may also increase referral to hospice facilities. In a study of patients admitted to one large U.S. non-profit multisite hospital between 2004 and 2007, patients who received a palliative care team consultation were 3.24 times more likely to be discharged to hospice ( $p < .001$ ), 1.52 times more likely to go to a nursing facility ( $p < .001$ ) and 1.59 times more likely to be discharged home with services ( $p < .001$ ) than those receiving usual care (after controlling for patient demographics and disease severity). {Brody et al., 2010} However, the study did not account for the cost savings associated with early hospice referral.

### **Hospice palliative care reduces symptoms as well as costs**

Part of the problem in capturing patient outcomes is that they may change over time. In a retrospective study of cancer patients, for example, symptoms such as pain, nausea, fatigue and dyspnea tended to be severe at the point of admission to a palliative care inpatient service. {Elsayem et al., 2004} Care in a palliative inpatient unit was associated not only with improvement in symptoms but also with a reduction in costs: the mean daily charge in the palliative care unit was 38% lower than the rest of the hospital. {Elsayem et al., 2004}

### **A few studies reported no clear economic benefit for inpatient palliative care:**

- A 1995 review had mixed results: some forms of palliative care reduced costs while others increased it. {Bailes, 1995}
- A 2003 review of specialist cancer and palliative nursing found that, because economic evaluations tend to consider a limited range of costs but a wide variety of outcomes, there was insufficient information to estimate cost-effectiveness ratios. {Douglas et al., 2003}
- A 2010 review reported that hospital-based palliative care tends to be less expensive than usual care {Simoens et al., Journal of Pain and Symptom Management, 2010}, but original research by the same author (a multicenter study in Belgium) found PCU care was actually more expensive than that provided in acute care wards. {Simoens et al., Journal of Palliative Medicine, 2010} The higher costs of care in the PCU were due to higher staffing levels. When the staffing issue was removed, the results were more positive: the same study found palliative care provided in an acute ward (i.e., without the higher staffing level) to be less expensive than usual care in the same ward. {Simoens et al., Journal of Palliative Medicine, 2010}
- In the U.K., one report found staffing costs tended to be higher in hospices than hospital-based, National Health Service (NHS) palliative care wards, due to higher staffing levels. {Roberts & Hurst, 2012}

### The setting may affect costs

According to a 2008 cost analysis, palliative hospice care was less expensive when delivered in a rehabilitation or extended care hospital than in acute care facilities (approximately €388 per day vs. €482). {Tibi-Levy et al., 2006} In other words, the characteristics of the setting – as well as those of the patients – may influence the cost of inpatient palliative care.

### Access to hospital-based hospice palliative care varies

In interpreting the data from U.S. studies, it's important to note that the regulations concerning Medicare coverage of palliative hospice care affect the number and type of patients accessing this form of care. As of 2009, even though over one million elderly Americans were using Medicare/Medicaid-funded palliative hospice services (a 13-fold increase over the previous 20 years), less than a third (31%) of U.S. hospitals provided some form of hospice palliative care. {Connor, 2009} Medicare hospice benefits are also limited to patients with an anticipated life expectancy of no more than six months and they exclude any “curative” treatment. Jennings and Morrissey (2011) have argued that the financing and organization of hospice palliative care services in the U.S. are not designed to meet the needs of patients, particularly the frail elderly, those with uncertain disease trajectories, or those who may want or need both palliative and disease-modifying therapies.

Ireland has specific recommendations that establish the number of inpatient hospice palliative care beds, nurses, and consultants per unit of population. {Murray, 2009} However, the geography of Canada may pose a challenge for hospital-based centres. Establishing and staffing inpatient hospice palliative units may not be cost-efficient outside of major urban centres; at the same time, sending patients out of their communities (i.e., to urban centres) for care may be neither appropriate nor acceptable.

**Although hospital-based hospice palliative care units have been the focus of most cost-effectiveness research, they may not be the most appropriate model of service delivery for Canada.**

## Home-based Programs

The home is a common setting for the delivery of hospice palliative care. In 2010, about two-thirds (69%) of hospice palliative care patients in the U.S. received care at home. {National Hospice and Palliative Care Organization, 2012} Unfortunately, due to the “patchwork” nature of hospice palliative care services in Canada, there is no accurate estimate of the number of people receiving end-of-life care in the home. However, as of 2000, 75% of deaths in Canada occur in hospitals and long-term care facilities. {Canadian Hospice Palliative Care Association, 2012}

### Home-based hospice palliative care is cost-effective and reduces the use of other health services

- According to a randomized controlled trial of 298 terminally-ill patients from two health maintenance organizations in two U.S. states, those who received in-home palliative care from an interdisciplinary team were more satisfied with care ( $p < .05$ ), more likely to die at home

( $p < .001$ ), less likely to visit emergency department (20% vs. 33%,  $p = .01$ ), and less likely to be admitted to hospital (38% vs. 59%,  $p < .001$ ). {Brumley et al., 2007} Compared with patients receiving usual care, those receiving palliative care had 33% lower health care costs ( $p = .03$ ): the average cost per day was \$95.40 for palliative care patients vs. \$212.80 for those receiving usual care ( $p = .02$ ). {Brumley et al., 2007}

- An Italian study reported fewer hospital readmissions for those who received in-home palliative care compared to those who received usual care (17% vs. 38%,  $p < .001$ ), as well as lower hospitalization costs. {Pace et al., 2012}
- In Catalonia, publicly-funded palliative care delivered primarily through home care saved the health care system €3 million in 1995 and €8 million in 2005. {Paz-Ruiz et al., 2009}
- In Spain, the cost of caring for patients who received usual care were 71% higher than the cost of caring for those who received visits in the home from a palliative home care team. {Serra-Prat et al., 2001}
- In Israel, the overall per-patient cost of care for patients with terminal metastatic cancer was \$4,761 for those receiving home hospice care (a figure that includes program operating costs) and \$12,434 for those receiving conventional health care services. {Shnoor et al., 2007}

However, the evidence is not unequivocal. Based on a review of studies in Italy, Spain, Israel and the U.K., home-based palliative care, such as consultations with a specialized multiprofessional palliative care team, can reduce health care costs, compared to usual care. {Simoens et al., Journal of Pain and Symptom Management, 2010} However, another review reported that only one of 22 randomized controlled trials showed a clear cost advantage. {Zimmermann et al., 2008}

In a Canadian study of hospice palliative care, the largest component of total costs was inpatient hospital stays (\$6,126, 95% CI \$4,600-7,650), followed by home care (\$3,456 95 CI \$2,075-4,838), and informal caregiving (\$3,251, 95% CI \$2,709-3,793). {Dumont et al., 2009} A project testing a “shared-care” model of providing home-based palliative hospice care in a rural setting (the Niagara West End-of-Life Shared-Care Project) found that the average costs per person varied by gender and disease but were approximately \$117.95 (2007 \$CDN) per patient day or a total of \$17,112.19 per patient. {Klinger et al., 2011} As there was no control group, it is not clear whether these costs represent a cost-savings or cost-avoidance for the health care system. The average cost was higher than previously reported for a cancer-only population in an urban Ontario setting and roughly equivalent to the government’s per diem for long-term care homes (\$124.55), but less than costs associated with alternative level of care bed (\$450.00) or palliative care hospital beds (\$1,097.03). {Klinger et al., 2011}

### Shifting 10% of patients at end of life from acute care to home care would save \$9 million

Another Canadian report estimated that it costs approximately \$4,700 per client to provide palliative care in the home – or about one-quarter of the \$19,000 for acute care. {The Ontario Association of Community Care Access Centres et al., 2010} Based on that cost differential, shifting just 10% of palliative care patients from acute care to home care would save \$9 million in health care costs. {The Ontario Association of Community Care Access Centres et al., 2010} However, when an interdisciplinary palliative home care service was piloted in Ontario, the cost was higher: the total cost was \$2.4 million or an average of \$5,586 per patient. {Johnson et al., 2009}

According to a short non-peer-reviewed report of palliative hospice home care in Italy, the cost averaged €35.5 per patient per day. In contrast, the general cost of in-hospital admission was approximately €310 per patient per day. {Di Cosimo et al., 2003} However, it may not be appropriate to compare the costs of a single-clinic program involving 256 patients with general population hospitalization costs.

In a cost-minimization analysis in Greece, the incremental cost of providing home palliative care for patients with terminal hematological cancers (over and above the cost of conventional community-based care) was €522 (95% CI 515-528). {Tzala et al., 2005} Hospice palliative home care was more expensive in part because of higher overhead costs and more frequent blood testing. However, better coordination between the home palliative care team and attending physicians could reduce both the frequency and types of tests conducted, reducing costs until they were comparable to conventional care. {Tzala et al., 2005}

### **\$1 spent on hospice palliative home care saves \$1 to \$2 in other health care spending**

One American report estimates that for each Medicare dollar spent on hospice home care, the health care system saves one to two dollars in other expenditures {Miller et al., 2002}, and these savings add up to \$3,192 per patient in the last month of life. {Miller et al., 2002}

Only one of the studies retrieved failed to report a positive effect for home-based palliative hospice care. That controlled trial of a U.S. outpatient palliative medicine consultation team in the early 2000s (50 intervention and 40 control patients) found a trend suggesting a benefit from home care but no statistically significant difference in total medical charges (means of \$43,448 [69,547] vs. \$47,221 [73,009],  $p=.80$ ). {Rabow et al., 2004} Although there were no significant cost savings associated with the program, there were clinical benefits, including a decrease in dyspnea and anxiety and improvements in sleep and spiritual well being. {Rabow et al., 2004}

### **Hospice palliative home care allows people to die at home**

According to public opinion polling, hospice palliative home care reflects the wishes of the majority of Americans who want to die at home, a desire that is reflected in the rapid growth of hospice providers since the 1980s. {Miller et al., 2002}

## **Other Community-based Programs**

### **Evidence on the effectiveness of other community-based programs is limited**

Palliative care can be delivered in a number of other community-based settings, such as day care, early palliative consultation services, community nursing and respite programs. However, evidence on the cost-effectiveness of these programs was limited to one study on each type of program.

### **Palliative day care is relatively inexpensive and may enhance access to palliative care services**

In a U.K. study of 120 clients and 53 control patients from five palliative day care centres in southern England {Douglas et al., 2003}, palliative day care cost approximately £54 per person per day in formal costs; £75 per day including unpaid resources. A full economic evaluation could not

be undertaken due to the dearth of evidence on the effectiveness of the program. Although participating patients and families valued and were satisfied with the service, there were no measured changes in symptom management or quality of life. {Douglas et al., 2003} Evidence that the day care program reduced the need for other services (e.g., home nursing or primary care) was inconclusive; however, palliative day care seemed to increase access to hospice palliative services that control patients did not access through other means or programs (i.e., they apparently went without many hospice palliative services).

### **Early palliative consultation can reduce costs and use of other health services**

Higginson et al. (2009; 2011) looked at early (“fast track”) consultation by a multiprofessional palliative care team for patients with severe MS in multiple settings, including the home, outpatient clinic, nursing home or hospital. At 12 weeks, service costs for the “fast-track” patients, including inpatient care and informal care, were £1,789 lower per patient (bootstrapped 95% CI - £5,224 to £1,902) compared to usual care (later stage palliative consultation) patients. {Higginson et al., 2011} “Fast-track” patients also made less use of other resources: usual care patients were more likely to consult with their general practitioner, receive help from family or friends, and to be admitted to or seen at hospital. {Higginson et al., 2009}

### **Visits from community nurses reduce costs and inpatient days**

Another U.K. study compared the cost of care for palliative patients randomized to receive care coordination through visits by district nurses with the cost of usual care. {Raftery et al., 1996} The cost per patient for those who received nursing visits was 68% lower than usual care (£4,774 for those receiving nurse visits and coordination vs. £8,034 for usual care patients,  $p=.006$ ) – due to significantly fewer inpatient hospital days (mean of 24 vs. 30 days,  $p=.002$ ) and nursing home visits (mean 14.5 vs. 37.5 visits,  $p=.01$ ). The ratio of potential cost savings to cost of the coordination services was between 4:1 and 8:1. {Raftery et al., 1996}

### **Respite care reduces hospitalizations and improves caregiver satisfaction**

Another community-based means of delivering hospice palliative services is palliative respite care. A 2009 mixed methods study in Australia found that, after adjusting for matching variables (age, gender and condition), patients receiving respite care were 80% less likely to be hospitalized than historical controls ( $p<.001$ ). {Barrett et al., 2009} Based on the number of hospital bed days avoided, the respite program saved the Australian health care system \$34,375AUS over 25 weeks. {Barrett et al., 2009} Total cost savings were estimated at \$47,684 per patient per year. Qualitative research showed the program increased caregiver satisfaction, although utilization appeared to be influenced by family support systems, caregiver anxiety or depression, and caregiver perceptions. {Barrett et al., 2009}

### **Alternative forms of community-based hospice palliative care may be beneficial and help to reduce health care costs.**

## Hospice-based Programs

### Information on cost effectiveness of hospices is limited

Taylor (2009) argues that hospice is a “rare example” of a multiprofessional intervention that improves patient quality of life and reduces third-party health care expenses. However, he defines hospice as a type of care and does not differentiate among the settings where it is delivered. In fact, no studies focused exclusively on the cost of care in free-standing hospice facilities, as opposed to hospital-based programs. For example, in the U.S., 21.9% of hospice patients receive care in what is classified as an “inpatient facility” {National Hospice and Palliative Care Association, 2012}, which includes hospices and units associated with or in hospitals.

### Hospice care reduces costs for the health care system but not informal caregivers

According to an analysis of Medicare beneficiaries age 65 and over who died between 1998 and 2001, pre-hospice care costs were higher for those who used hospice than for matched controls (\$25,409 vs. \$23,210,  $p=.005$ ) – although the cost difference may be due to a selection bias in who chooses hospice-based care. However, subsequent (post-hospice) costs were significantly lower for those who received hospice care, compared to the controls (\$7,319 vs. \$9,627,  $p<.001$ ). Overall, there was a non-significant difference in total costs in favour of hospice care (\$32,727 vs. \$32,837,  $p=.09$ ). The effect was greatest for Medicare expenditures. After controlling for selection bias, hospice-based care saved Medicare an average of about \$2,300 per person; it did not, however, reduce out-of-pocket or informal costs. During the last 30 days of the person’s life, families’ out-of-pocket expenses were \$255 for usual care compared to \$540 for those who used hospice continuously until death and \$857 for those who moved in and out of hospice ( $p=.01$ ). {Taylor, 2009}

### Hospice staffing models may be more costly but provide better quality care

In England, an evaluation of staffing levels in seven palliative care wards and 16 hospices found that hospices (many of which were independent, voluntary or charitable facilities) were more expensive to run than hospital-based, National Health Service-supported palliative care units because of higher staffing levels. {Roberts & Hurst, 2012} At the same time, the analysis reported that the hospice facilities delivered a higher quality of care despite workloads that were, on average, greater than those of hospital-based palliative units. {Roberts & Hurst, 2012} However, the study was not constructed to compare potential or actual cost savings for the health care system or for patients.

## IV. COMPARING HOSPICE PALLIATIVE CARE APPROACHES

Even when palliative care is funded by the government it can be delivered in a number of ways or in different settings. {Finlay, 2009} Are some approaches more cost-efficient or less expensive than others? A number of literature reviews have tried to address this issue, but the evidence is limited and findings have been mixed.

**While hospice palliative care appears to be less costly than usual care in most settings, cost differences between different palliative care models are less clear.**

A 1999 review of studies assessing different models of palliative hospice care delivery, found only one that provided adequate information on costs. {Critchley et al., 1999} In this single study, traditional home care services during the last 24 weeks of cancer care was 30% more costly for Medicare than either hospice palliative care delivered in the home or conventional oncology care. {Critchley et al., 1999}

A 2008 review of 22 randomized controlled trials found that only one, a U.S. study comparing in-home palliative care to usual care in two health maintenance organizations in two states, showed a cost advantage for home-based services. {Zimmermann et al., 2008} However, a 2009 review of systematic reviews concluded that while specialized palliative care is less expensive than conventional care, there was no difference in costs or cost-effectiveness of different hospice palliative care approaches or programs. {Garcia-Perez et al., 2009}

A 2010 review reported home-based hospice palliative care is less expensive than usual care but did not compare the cost of home-based to in-patient palliative services. {Simoens et al., Journal of Pain and Symptom Management, 2010} In contrast, a 2011 study in South Africa found that the cost per hospital outreach visit was US\$50 less than the average cost of a patient-day equivalent in a district hospital. {Hongoro & Dinat, 2011} The authors of that study concluded that for an over-burdened service in a low-resource setting, moving services out into the community may be cost beneficial. It is unclear whether their findings can be generalized to a high-resource setting such as Canada.

**Comparisons should look beyond cost to patient satisfaction**

A study in Perth, Australia, in the 1980s found the cost of hospice services delivered through general practitioners to be similar to hospitalization costs (i.e., there was no difference between community-based and hospital-based services). However, the community-based model was associated with additional benefits, such as increased patient and family satisfaction and choice. {Boldy, 1989} This suggests that cost alone may not be a sufficient factor upon which to compare service delivery models.

## V. PERCEPTIONS OF THE BENEFITS OF HOSPICE PALLIATIVE CARE

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Over the past 20 years in the U.S., there has been a 13-fold increase in the number of people receiving Medicare palliative benefits. {Connor, 2009} However, experts believe the financing and organization of hospice palliative care in the U.S. are not adequate to meet either current or future needs of the frail elderly and those who may want or need both palliative and disease-modifying therapies. {Jennings & Morrisey, 2011}

The case for expanding hospice palliative care services is frequently based on evidence these services reduce the demand for inappropriate treatment. {Adler et al., 2009; Bruera & Yennurajalam, 2012; Jennings & Morrisey, 2011; Meier, 2011} Cost efficiencies associated with hospice palliative care include: proactive pain and symptom control, appropriate discontinuation of active treatment, rationalization of non-essential medications, facilitation of planned and rapid discharge for end-of-life care, and fewer re-hospitalizations. {Mula & Raftery, 2011} More hospice palliative care is required to address the critical economic issues central to health care reform. {Sherman & Cheon, 2012}

### Communications, goal setting and interdisciplinary care key to effectiveness

Using data from Morrison's analysis of Medicaid charges {Morrison et al., 2011}, Meier & Beresford argue that palliative care can save hospitals \$250 or more in direct costs per patient per day, particularly if it focuses on the processes of communications and goals clarification, and is delivered by interdisciplinary teams. {Meier & Beresford, 2009} For example, by giving patients and families a realistic understanding of their options, better communication may be key in reducing ICU admissions as well as other interventions that are unlikely to save the person or improve his or her health status. {Morgan et al., 2011} Hospice palliative care also has the potential to prevent some of the detrimental effects of aggressive medical care, such as procedural complications, hospital-acquired infections, medical errors, unnecessary "defensive care" (interventions to avoid lawsuits) or "desperation care" (care given to dying patients because families cannot accept the irreversible nature of the illness). {Neuberg, 2009}

In an editorial on bending the cost curve in cancer care, Smith and Hilner (2011) argue that health care costs are increased "as a result of what we fail to do: engage in discussions about the possibility of death, end-of-life choices, and ways patients make the transition to the prospect of dying". Although early studies of programs to implement advanced directives in acute care settings did not show evidence of cost savings, once advanced directives and end-of-life planning were moved into the community and introduced earlier in the disease process, they were found to significantly reduce total health care costs. {Wholihan & Pace, 2012}

Honest end-of-life discussions can not only prevent inappropriate health care utilization and costs but may help to reduce the demand on families and informal caregivers. For chronic, life-limiting diseases such as Parkinson's disease or MS, informal caregiving costs may be higher than formal care costs, especially as the severity of the disease increases. {McCrone, 2009}



## Earlier promotion of advanced directives and better care coordination could increase savings

Some critics have argued that the actual amount of health care costs that can be avoided by providing hospice palliative care is relatively small (e.g., three percent of total care costs). {Payne et al., 2002} However, savings can be increased by promoting advanced directives early in the disease process and coordinating care. {Payne et al., 2002} Furthermore, saved monies are as important to hospitals as the same amount generated from new revenue. {Meier & Beresford, 2009}

There is also some evidence that hospice palliative care can reduce more than just medical costs. In Norway, palliative care was effective in reducing time spent in nursing homes (i.e., long term care or complex, continuing care facilities) in the last month of life. In this study, palliative care was not associated with significant differences in hospital use but reduced nursing home utilization: only 7.2% of patients receiving palliative care required nursing home care compared to 14.6% of those receiving usual care ( $p < .01$ ). {Jordhoy et al., 2000} Given the growing crisis in long-term care in Canada, such reductions could be beneficial.

## When hospice palliative care is a priority, its impact increases

Palliative care has been a government priority in Spain since the early 1990s, and the country has seen a significant shift from conventional to palliative care beds, which have a lower per unit cost. Hospice palliative care has been credited with reducing hospital stays (from 25.5 to 19.2 days,  $p = .002$ ) and decreasing use of hospital emergency departments (from 52% to 30.6%,  $p = .001$ ). It has also increased the proportion of people choosing to die at home (from 31% to 42%) and the number receiving coordinated hospice palliative care. {Gomez-Batiste et al., 2006} In Spain, palliative care services are associated with an estimated 61% savings in hospital costs and with similar, albeit less dramatic, savings in home-based care. {Gomez-Batiste et al., 2006} In Catalonia, overall health care savings from hospice palliative care were estimated to be €8 million {Paz-Ruiz et al., 2009} in 2005.

## More rigorous economic research is required

The level of evidence concerning the cost-savings associated with palliative care has been sufficient to support advocacy efforts in countries around the world, including Australia {Allen et al., 2008; Gordon et al., 2009; Palliative Care Australia, 2012; Victorian Government Department of Human Services, 2007}, Canada {Albrecht et al., 2011; Hollander & Chappell, 2002; The Ontario Association of Community Care Access Centres et al., 2010}, Ireland {Murray, 2009}, the U.S. {Almgren, n.d.; Committee on Care at the End of Life, 1997; Miller et al., 2002; National Priorities Partnership, 2008}, the U.K. {Finlay, 2009; Hatzidandreu et al., 2008; Ward et al., 2004} and Europe {Davies, 2004}. Such reports draw heavily on the literature showing the cost savings and increased efficiencies associated with palliative care. For example, U.K. modeling data suggest that reducing terminal cancer patients' reliance on acute care by providing hospice palliative care could free up between £16 million and £171 million for the health care system. {McBride et al., 2011}

Despite these claims, there are calls for more methodologically rigorous economic evaluations of hospice palliative care to strengthen the evidence base. {Boni-Saenz et al., 2005; Bruner, 1998; Costantini & Beccaro, 2009; Gomes et al., 2009; Harding et al., 2009; Haycox, 2009; Higginson, 1999; Hoch, 2009}

## VI. POLICY IMPLICATIONS OF THE EVIDENCE ON COST EFFECTIVENESS

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The cost of caring for people during the last months of life consumes a disproportionate share of health care resources. Much of this cost is due to medical needs; however, for people with chronic life-limiting conditions, a substantive amount may be associated with inappropriate or unnecessary curative interventions.

For many people nearing end of life, traditional “active care” is less than optimal because it may not effectively manage their symptoms or address their and their family’s psychological or spiritual needs.

Hospice palliative care – a holistic approach that uses a combination of active and compassionate therapies to comfort and support the patient and his/her family – may provide an effective way to reduce costs and improve care.

Compared to usual care, hospice palliative care is better at meeting the needs of terminal patients and their families, including their psychological and spiritual needs. It is associated with better management of symptoms such as pain and fatigue and more referrals to hospice programs. It can also reduce the length of hospital stays, the utilization of high-resource interventions such as ICUs, and unnecessary curative treatments.

Currently only 16% to 30% of Canadians have access to or receive hospice palliative and end-of-life care. {Canadian Hospice Palliative Care Association, 2012} Three-quarters of deaths still occur in hospitals and long-term care facilities, rather than – as most Canadians would prefer – at home. {Canadian Hospice Palliative Care Association, 2012} Improved and more equitable access to hospice palliative care could not only save the Canadian health care system millions of dollars each year but enhance care and quality of life for patients and families.

To date, few studies have been conducted that are comprehensive, quantify both costs and benefits, or compare different models or approaches to delivering hospice palliative care. Hospital-based hospice palliative units or teams are the model that has received the most study. Such programs result in cost savings of about \$7,000 to 8,000 (U.S.) per patient. Their widespread application could reduce health care expenditures substantially.

In Spain, a comprehensive system of hospital- and community-based hospice palliative services has been credited with saving the health care system several million Euros each year. One study from Norway suggests that hospice palliative care may also have the potential to reduce the burden on long-term care (“nursing homes”).

In Canada, the proportion of the population aged 85 years and older is growing rapidly; in many provinces, such as Ontario, there is an emerging crisis concerning the number of long-term care beds available for existing and future clients. The ability of palliative hospice care to reduce the strain on long-term care resources could be substantive and deserves notice.

Despite effective use of economic arguments to advocate for hospice palliative care, there are still important gaps in the research literature. More and better economic evaluations of hospice

palliative care are required, including comparisons of different delivery models (i.e., hospital units or teams, specialist hospice facilities, home care services, and other community-based services).

Policy makers currently do not have enough evidence to determine which model or combination of models would be best suited to the Canadian setting or preferred by Canadian patients and families. For example, it is unclear whether hospital-based models should be the preferred method of service delivery in Canada, given Canada's geography. It may be more efficient for hospice palliative care to be integrated into all health care settings, rather than restricted to specialized units in major urban centres.

An integrated hospice palliative care approach could be a relatively low-cost strategy to ensure that health care providers: recognize those who can benefit from hospice palliative services earlier in the course of a life-limiting illness; have the skills to provide those services; and have timely access to specialists to support patients and families across settings (i.e., whether in the community, care facilities or hospitals).

Patients and families should be able to access hospice palliative care services in the setting they prefer; there should be "no wrong door" to receiving the right care at the right time.

## REFERENCES

- Adler E, Goldfinger J, Kalman J, et al. *Palliative care in the treatment of advanced heart failure*. *Circulation*. 2009;120:2597-606.
- Albrecht H, Comartin J, Valeroiete F, et al. *Not to be forgotten, care of vulnerable Canadians*. Parliamentary Committee of Palliative and Compassionate Care, November 2011. . Ottawa: 2011.
- Allen S, O'Connor M, Chapman Y, et al. *Funding regimes and the implications for delivering quality palliative care nursing within residential aged care units in Australia*. *Rural Remote Health*. 2008;8(3):903.
- Almgren G. *Palliative Care with Older Adults. Section 3: Policy Issues Related to Aging and Palliative Care*. n.d.
- Back A, Li H & Sales A. *Impact of palliative care case management on resource use by patients dying of cancer at a Veterans Affairs medical center*. *Journal of Palliative Medicine*. 2005;8(1):26-35.
- Bailes J. *Cost aspects of palliative cancer care*. *Semin Oncol*. 1995;22(2 Suppl 3):64-6.
- Barrett M, Wheatland B, Haselby P, et al. *Palliative respite services using nursing staff reduces hospitalization of patients and improves acceptance among carers*. *International Journal of Palliative Nursing*. 2009;15(8):389-95.
- Bendaly E, Groves J, Juliar B, et al. *Financial impact of palliative care consultation in a public hospital*. *Journal of Palliative Medicine*. 2008;11(10):1304-8.
- Boldy D. *Economic appraisal in health care with particular reference to hospice and palliative care*. *Austral Health Review*. 1989;12(2):72-6.
- Boni-Saenz A, Dranove D, Emanuel L, et al. *The price of palliative care: toward a complete accounting of costs and benefits*. *Clin Geriatr Med*. 2005;21(1):147-63.
- Brody A, Ciemins E, Newman J, et al. *The effects of an inpatient palliative care team on discharge disposition*. *Journal of Palliative Medicine*. 2010;13(5):541-8.
- Bruera E & Yennurajalingam S. *Palliative care in advanced cancer patients: how and when?* *Oncologist*. 2012;17(2):267-73.
- Brumley R, Enguidanos S, Jamison P, et al. *Increased satisfaction with care and lower costs: results of a randomized trial of in-home palliative care*. *J Am Geriatr Soc*. 2007;55(7):993-100.
- Bruner D. *Cost-effectiveness and palliative care*. *Semin Oncol Nurs*. 1998;14(2):164-7.
- Canadian Hospice Palliative Care Association. *CHPCA Fact Sheet - Hospice Palliative Care in Canada*. Ottawa: 2012 May 2012.
- Canadian Hospice Palliative Care Association. *The Canadian Hospice Palliative Care Association — A History*. Ottawa: Canadian Hospice Palliative Care Association.; 2012; Available from: <http://www.chpca.net/about-us/history.aspx>.
- Canadian Hospice Palliative Care Association Nursing Standards Committee. *Canadian Hospice Palliative Care Nursing Standards of Practice*. Ottawa: Canadian Hospice Palliative Care Association 2009.
- Ciemins EL, Blum L, Nunley M, et al. *The economic and clinical impact of an inpatient palliative care consultation service: a multifaceted approach*. *Journal of Palliative Medicine*. 2007;10(6):1347-88.
- Committee on Care at the End of Life. *Approaching Death: Improving Care at the End of Life*. Washington, DC: Institute of Medicine, 1997
- Connor S. *U.S. hospice benefits*. *Journal of Pain and Symptom Management*. 2009;38(1):105-9.
- Costantini M & Beccaro M. *Health services research on end-of-life care*. *Curr Opin Support Palliat Care*. 2009;3(3):190-4.
- Critchley P, Jadad AR, Taniguchi A, et al. *Are some palliative care delivery systems more effective and efficient than others: a systematic review of comparative studies*. *Journal of Palliative Care*. 1999;15(4):40-7.
- Currow DC, Abernethy AP, Bausewein C, et al. *Measuring the net benefits of hospice and palliative care: a composite measure for multiple audiences - palliative net benefit*. *Journal of Palliative Medicine*. 2011;14(3):264-5.
- Davies E. *What are the palliative care needs of older people and how might they be met?* Copenhagen: WHO Regional Office for Europe (Health Evidence Network report), 2004.

- Davis M, Walsh D, LeGrand S, et al. *The financial benefits of acute inpatient palliative medicine, an inter-institutional comparative analysis by All Patient Refined-Diagnosis Related Group and Case Mix Index*. *Journal of Support Oncol*. 2005;3:313-6.
- Davis M, Walsh D, Nelson KA, et al. *The business of palliative medicine - Part 2: The economics of acute inpatient palliative medicine*. *American Journal of Hospice and Palliative Care*. 2002;19(2):89-95.
- Di Cosimo S, Pistillucci G, Leggio M, et al. *Palliative home care and cost savings: encouraging results from Italy*. *New Zealand Medical Journal*. 2003;116(1170):1-4.
- Douglas H, Halliday D, Normand C, et al. *Economic evaluation of specialist cancer and palliative nursing: a literature review*. *International Journal of Palliative Nursing*. 2003;9(10):424-8.
- Douglas H, Normand C, Higginson I, et al. *Palliative day care: what does it cost to run a centre and does attendance affect use of other services?* *Palliative Medicine*. 2003;17(7):628-37.
- Drummond M, Stoddart G & Torrance G. *Methods for the Economic Evaluation of Health Care Programmes*. Oxford: Oxford Medical Publications; 1987.
- Dumont S, Jacobs P, Fassbender K, et al. *Costs associated with resource utilization during the palliative phase of care: A Canadian perspective*. *Palliative Medicine*. 2009;23(8):708-17.
- Dumont S, Jacobs P, Turcotte V, et al. *The trajectory of palliative care costs over the last 5 months of life: a Canadian longitudinal study*. *Palliative Medicine*. 2010;24:630-40.
- Economist Intelligence Unit *The Quality of Death, Ranking end-of-life care across the world*. A report commissioned by the LIEN Foundation. London: 2010.
- Elsayem A, Swint K, Fisch M, et al. *Palliative care inpatient service in a comprehensive cancer center: clinical and financial outcomes*. *Journal of Clinical Oncology*. 2004;22(10):2008-14.
- Falls C. *Palliative health care: cost reduction and quality enhancement using end-of-life survey methodology*. *J Gerontol Soc Work*. 2008;51(1-2):53-76.
- Fassbender K, Fainsinger R, Carson M, et al. *Cost trajectories at the end of life: the Canadian experience*. *Journal of Pain and Symptom Management*. 2009;38(1):75-80.
- Finlay I. *Developing a template to plan palliative care services: the Welsh experience*. *Journal of Pain and Symptom Management*. 2009;38(1):81-6.
- Foley KM & Gelband H (eds). *Improving Palliative Care for Cancer: Summary and Recommendations*. The National Academy Press, Washington DC; 2001.
- Garcia-Perez L, Linetova R, Martin-Olivera R, et al. *A systematic review of specialized palliative care for terminal patients: which model is better?* *Palliative Medicine*. 2009;23(1):17-22.
- Gomes B, Harding R, Foley K, et al. *Optimal approaches to the health economics of palliative care: report of an international think-tank*. *Journal of Pain and Symptom Management*. 2009;38(1):4-10.
- Gomez-Batiste X, Tuca A, Corrales E, et al. *Resource consumption and costs of palliative care services in Spain: a multicenter prospective study*. *Journal of Pain and Symptom Management*. 2006;31(6):522-32.
- Gordon R, Eagar K, Currow D, et al. *Current funding and financing issues in the Australian hospice and palliative care sector*. *Journal of Pain and Symptom Management*. 2009;38(1):68-74.
- Guerrier D, Zagorski B, Masucci L, et al. *Cost variations in ambulatory and home-based palliative care*. *Palliative Medicine*. 2010;24(5):523-32.
- Hall S, Kolliakou A, Petkova H, et al. *Interventions for improving palliative care for older people living in nursing care homes*. *Cochrane Database of Systematic Reviews*. 2011;3:Art. No.: CD007132. DOI: 10.1002/14651858.CD007132.pub2.
- Harding R, Gomes B, Foley K, et al. *Research priorities in health economics and funding for palliative care: views of an international think tank*. *Journal of Pain and Symptom Management*. 2009;38(1):11-4.
- Hatziandreu E, Archontakis F, Daly A. *The Potential Cost Savings of Greater Use of Home- and Hospice-based end of life care in England*. RAND Technical Report; TR-642-NAO. 2008 Jan.

- Haycox A. *Optimizing decision making and resource allocation in palliative care*. Journal of Pain and Symptom Management. 2009;38(1):45-53.
- Hearn J & Higginson I. *Do specialist palliative care teams improve outcomes for cancer patients? A systematic literature review*. Palliative Medicine. 1998;12(5):317-32.
- Higginson I. *Evidence based palliative. There is some evidence - and there needs to be more*. BMJ. 1999;319(7208):462-3.
- Higginson I, Costantini M, Silber E, et al. *Evaluation of a new model of short-term palliative care for people severely affected with multiple sclerosis: a randomised fast-track trial to test timing of referral and how long the effect is maintained*. Postgrad Med J. 2011;87:769-75.
- Higginson I, McCrone P, Hart S, et al. *Is short-term palliative care cost-effective in multiple sclerosis? A randomized phase II trial*. Journal of Pain and Symptom Management. 2009;38(6):816-26.
- Hoch J. *Improving efficiency and value in palliative care with net benefit regression: an introduction to a simple method for cost-effectiveness analysis with person-level data*. Journal of Pain and Symptom Management. 2009 38(1):54-61.
- Hollander M. *Costs of end-of-life care: findings from the province of Saskatchewan*. Health care Quarterly. 2009;12(3):50-8.
- Hollander M & Chappell N. *Synthesis Report. Final Report of the National Evaluation of the Cost-Effectiveness of Home Care, A Report Prepared for the Health Transition Fund, Health Canada, August 2002*. Victoria, BC: 2002.
- Hongoro C & Dinat N. *A cost analysis of a hospital-based palliative care outreach program: implications for expanding public sector palliative care in South Africa*. Journal of Pain and Symptom Management. 2011;41(6):1015-24.
- Hughes J. *Palliative care and the QALY problem*. Health Care Anal. 2005 13(4):289-301.
- Hughes-Hallett T, Craft A & Davies C. *Funding the Right Care and Support for Every. Creating a Fair and Transparent Funding System; the Final Report of the Palliative Care Funding Review*. London: Palliative Care Funding Review, 2011.
- Hugodot A. *Cost-effectiveness of palliative care in hospital: a review of the literature (Part 3)*. Hospice Friendly Hospitals Programme. Dublin: 2007.
- Jennings B & Morrissey M. *Health care costs in end-of-life and palliative care: the quest for ethical reform*. J Soc Work End Life Palliat Care. 2011;7(4):300-17.
- Johnson A, Abernathy T, Howell D, et al. *Resource utilization and costs of palliative cancer care in an interdisciplinary health care model*. Palliative Medicine. 2009;23(5):448-59.
- Jordhøy M, Favers P, Saltnes T, et al. *A palliative-care intervention and death at home: a cluster randomised trial*. Lancet. 2000;356(9233):888-93.
- Jung H, Kim J, Heo D, et al. *Health economics of a palliative care unit for terminal cancer patients: a retrospective cohort study*. Support Care Cancer. 2012;20(1):29-37.
- Klinger CA, Howell D, Marshall D, et al. *Resource utilization and cost analyses of home-based palliative care service provision: The Niagara West End-of-Life Shared-Care Project*. Palliative Medicine. 2011;2012 Jan 15 Epub ahead of print.
- McBride T, Morton A, Nichols A, et al. *Comparing the costs of alternative models of end-of-life care*. Journal of Palliative Care 2011;27(2):126-33.
- McCrone P. *Capturing the costs of end-of-life care: comparison of multiple sclerosis, Parkinson's disease, and dementia*. Journal of Pain and Symptom Management. 2009;38(1):62-7.
- McKibbin A, Eady A & Marks S. *PDQ Evidence-based Principles and Practice*. Hamilton: BC Decker; 1999.
- Meier D. *Increased access to palliative care and hospice services: opportunities to improve value in health care*. Millbank Quarterly. 2011;89(3):343-80.
- Meier D & Beresford L. *Palliative care cost research can help other palliative care programs make their case*. Journal of Palliative Medicine. 2009;12(1):15-20.
- Miller G, Williams JJ, English D & Keyserling J. *Delivering Quality Care and Cost-Effectiveness at the End of Life. Building on the 20-Year Success of the Medicare Hospice Benefit*. Alexandria, Virginia: 2002.
- Morgan L, Howe L, Whitcomb J, et al. *Improving communication and cost-effectiveness in the intensive care unit through palliative care: a review of literature*. Dimensions of Critical Care Nursing. 2011;30(3):133-8.

- Morrison R, Dietrich J, Ladwig S, et al. *Palliative care consultation teams cut hospital costs for Medicaid beneficiaries*. Health Affairs (Millwood). 2011;30(3):454-63.
- Morrison R, Penrod J, Cassel B, et al. *Cost savings associated with U.S. hospital palliative consultation programs*. Archives of Internal Medicine. 2008;168(16):1783-90.
- Mula C & Raftery A. *Evidencing cost efficiencies in specialist palliative care*. International Journal of Palliative Nursing. 2011;17(12):575.
- Murray E. *How advocates use health economic data and projections: the Irish experience*. Journal of Pain and Symptom Management. 2009;38(1):97-104.
- National Hospice and Palliative Care Organization. *NHPCO Facts and Figures: Hospice Care in America*. Alexandria, VA; 2012.
- National Institutes of Health. *Fact Sheet: End-of-Life*. Bethesda: 2010.
- National Priorities Partnership. *National Priorities and Goals: Aligning Our Efforts to Transform America's Healthcare*. Washington, DC: 2008.
- Neuberg G. *The cost of end-of-life care: a new efficiency measure falls short of AHA/ACC standards*. Circ Cardiovasc Qual Outcomes. 2009;2(2):127-33.
- New Courtland Center for Transition and Health. *Transitional Care Model*. University of Pennsylvania School of Nursing; 2008-2009 [cited 2012 2012/09/21]; Available from: <http://www.transitionalcare.info/index.html>
- O'Mahony S, Blank AE, Zallman L, et al. *The benefits of a hospital-based inpatient palliative care consultation service: preliminary outcome data*. Journal of Palliative Medicine. 2005;8(5):1033-9.
- The Ontario Association of Community Care Access Centres (OACCAC), The Ontario Federation of Community Mental Health and Addiction Programs (OFCMHAP) & The Ontario Hospital Association (OHA). *Ideas and Opportunities for Bending the Health Care Cost Curve. Advice for the Government of Ontario, April 2010*. 2010
- Ostgathe C, Walshe R, Wolf J, et al. *A cost calculation model for specialist palliative care for patients with non-small cell lung cancer in a tertiary centre*. Support Care Cancer. 2008;16(5):501-6.
- Pace A, Di Lorenzo C, Capon A, et al. *Quality of care and rehospitalization rate in the last stage of disease in brain tumor patients assisted at home: a cost effectiveness study*. Journal of Palliative Medicine. 2012;15(2):225-7.
- Palliative Care Australia. *Submission to the Treasurer on Priorities for the 2012 Federal Budget on behalf of Palliative Care Australia*. Deaking West, ACT: 2012.
- Payne S, Coyne P & Smith T. *The health economics of palliative care*. Oncology (Willston Park). 2002;16(6):801-8.
- Paz-Ruiz S, Gomez-Batiste X, Espinosa J, et al. *The costs and savings of a regional public palliative care program: the Catalan experience at 18 years*. Journal of Pain and Symptom Management. 2009;38(1):87-96.
- Penrod J, Deb P, Dellenbaugh C, et al. *Hospital-based palliative care consultation: effects on hospital cost*. Journal of Palliative Medicine. 2010;13(8):973-9.
- Penrod J, Deb P, Luhrs C, et al. *Cost and utilization outcomes of patients receiving hospital-based palliative care consultation*. Journal of Palliative Medicine. 2006;9(4):855-60.
- Pronovost P & Angus D. *Economics of end-of-life care in the intensive care unit*. Critical Care Med. 2001;29(2, Suppl S):N46-N51.
- Rabow MW, Dibble SL, Pantilat SZ, et al. *The comprehensive care team, a controlled trial of outpatient palliative medicine consultation*. Archives of Internal Medicine. 2004;164:83-91.
- Radbruch L & Payne S. *White Paper on standards and norms for hospice and palliative care in Europe: part 1. Recommendations from the European Association for Palliative Care*. European Journal of Palliative Care. 2009;16(6):278-89.
- Raftery J, Addington-Hall J, MacDonald L, et al. *A randomized controlled trial of the cost-effectiveness of a district co-ordinating service for terminally ill cancer patients*. Palliative Medicine. 1996;19(2):151-61.
- Roberts D & Hurst K. *Evaluating palliative care ward staffing using bed occupancy, patient dependency, staff activity, service quality and cost data*. Palliative Medicine. 2012;2012 Jun 11 Epub ahead of print.



- Serra-Prat M, Gallo P & Picaza J. *Home palliative care as a cost-saving alternative: evidence from Catalonia*. *Palliative Medicine*. 2001;15:271-8.
- Sherman D & Cheon J. *Palliative care: a paradigm of care responsive to the demands for health care reform in America*. *Nursing Economics*. 2012;30(3):163-62.
- Shnoor Y, Szlaifer M, Aoberman A, et al. *The cost of home hospice care for terminal patients in Israel*. *American Journal of Hospice and Palliative Care*. 2007;24:284-90.
- Shugarman L, Decker S & Bercovitz A. *Demographics and social characteristics and spending at the end of life*. *Journal of Pain and Symptom Management*. 2009;38(1):15-26.
- Simoens S, Kutten B, Keirse E, et al. *Costs of terminal patients who receive palliative care or usual care in different hospital wards*. *Journal of Palliative Medicine*. 2010;13(11):1365-9.
- Simoens S, Kutten B, Keirse E, et al. *The costs of treating terminal patients*. *Journal of Pain and Symptom Management*. 2010;40(3):436-48.
- Smith T & Cassel J. *Cost and non-clinical outcomes of palliative care*. *Journal of Pain and Symptom Management*. 2009;38(1):32-44.
- Smith T, Coyne P, Cassel B, et al. *A high-volume specialist palliative care unit and team and reduce in-hospital end-of-life care costs*. *Journal of Palliative Medicine*. 2003;6(5):699-705.
- Smith T & Hillner B. *Bending the cost curve in cancer care*. *NEJM*. 2011;364(21):2060-5.
- Stephens S. *Hospital-based palliative care: cost effective-care for patients with advanced disease*. *Journal of Nursing Administration*. 2008;38(3):143-5.
- Taylor D. *The effect of hospice on Medicare and informal care costs: the U.S. experience*. *Journal of Pain and Symptom Management*. 2009;38(1):110-4.
- Tibi-Levy Y, Lee V & de Pouvourville G. *Determinants of resource utilization in four palliative care units*. *Palliative Medicine*. 2006;20:95-106.
- Tzala S, Lord J, Ziras N, et al. *Cost of home palliative care compared with conventional hospital care for patients with haematological cancers in Greece*. *European Journal of Health Economics*. 2005;6(2):102-6.
- Victorian Government Department of Human Services. *Review of hospital-based palliative care consultancy teams, June 2007*. Melbourne: 2007.
- Villet-Lagomarison A. *Hospice vs. Palliative Care*. Richmond, VA: National Caregivers Library; 2012 [10/10/2012]; Available from: <http://www.caregiverslibrary.org/caregivers-resources/grp-end-of-life-issues/hsgpr-hospice/hospice-vs-palliative-care-article.aspx>.
- Walker H, Anderson M, Farahati F, et al. *Resource use and costs of end-of-life/palliative care: Ontario adult cancer patients dying during 2002 and 2003*. *Journal of Palliative Care*. 2011 27(2):79-88.
- Ward S, Salzano S, Sampson F, et al. *Guidance on Cancer Services, Improving Supportive and Palliative Care for Adults with Cancer*. Economic Review. London, 2004.
- White K, Stover K, Cassel J, et al. *Nonclinical outcomes of hospital-based palliative care*. *Journal of Health care Management*. 2006;51(4):260-73.
- Wholihan D & Pace J. *Community discussions: a vision for cutting the costs of end-of-life care*. *Nursing Economics*. 2012;30(3):170-8.
- Yang Y & Mahon M. *Considerations of quality-adjusted life-year in palliative care for the terminally ill*. *Journal of Palliative Medicine*. 2011;14(11):1197.
- Yang Y & Mahon M. *Palliative care for the terminally ill in America: the consideration of QALYs, costs, and ethical issues*. *Med Health Care Philos*. 2011:Epub Nov 10.
- Zimmermann C, Riechelmann R, Krzyzanowska M, et al. *Effectiveness of specialized palliative care: a systematic review*. *JAMA*. 2008;299(14):1698-709.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Adler ED, Goldfinger JZ, Kalman J, Park ME, Meier DE. Palliative care in the treatment of advanced heart failure. <i>Circulation</i> 2009;120:2597-2606	U.S.	Review	Cites evidence that inpatient palliative care consultations decrease number of procedure performed near the end of life, hospital length of stay, length of stay in ICU, hospital direct costs including pharmacy and imaging, and overall cost of care. Hospice has also been shown to reduce costs: can save up to 40% of health care costs during the last month of life and up to 17% during the last 6 months of life, by an average of \$2,309 per hospice user.	Discusses factors that predict an increased likelihood of death and how to open communication with patients and family members.
Albrecht H, Comartin J, Valeroiete F, Block K, Scarpaleggia F. <i>Not to be forgotten, care of vulnerable Canadians. Parliamentary Committee on Palliative and Compassionate Care, November 2011. Ottawa: Parliamentary Committee on Palliative and Compassionate Care, 2011.</i>	Canada	Review by Parliamentary Committee	Canada still falls short of providing equitable access to quality end-of-life care, with only 16-30% of those who need it receiving care. Even where palliative care is available (e.g., GTA) there are variations in availability and types of services. Need a national palliative care strategy, including a strengthened home care program for rural and First Nation communities that is respectful of cultural beliefs, traditions, practices and preferred language.	Review of literature shows that integrated continual care is cost-effective. Denmark reduced its nursing home beds during the mid-1980s to end of 1990s by 30% by increasing the proportion of people being cared for in the home. Need multiple but integrated models of delivering palliative care that include home-based delivered by regular home care staff supported by palliative care specialist teams; small community hospices to allow people to stay close to home; palliative care delivery within LTC home delivered by house and visiting specialist staff; and palliative care within ICU settings.
GREY LITERATURE				
Allen S, O'Connor M, Chapman Y, Francis K. Funding regimes and the implications for delivering quality palliative care nursing within residential aged care units in Australia. <i>Rural Remote Health</i> 2008;8(3):903	Australia	Discussion of how funding of residential aged care units affects type of care provided to Australian seniors in care facilities.	Rural acute hospitals, which the government believed were not sustainable, have signed Multi-purpose Services agreements to meet identified health needs of local and outlying communities, and this includes residential aged care for frail older people no longer able to live independently within the community. MPSs funding is provided on an agreed bed allocation that does not alter, irrespective of resident health status changes. This inflexibility creates a tension for MPSs who must meet the nursing care needs of deteriorating residents without additional fiscal resources. However they are also expected by government to adopt practices to support end-of-life and palliative care using an advocated contemporary approach. Supporting nursing staff to develop the skills necessary for compliance with the recommended guidelines is restricted by this funding inconsistency.	

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Almgren GR. <i>Palliative Care with Older Adults. Section 3: Policy Issues Related to Aging and Palliative Care.</i> Council on Social Work Education. National Center for Gerontological Social Work Education.	U.S.	Review	Evidence from mid-1990s once Medicare hospice benefits became widely utilized concluded that cost-savings was 25-40% during last month of life but only 10-17% during last 6 months. Subsequent research has brought mixed results, with some suggesting significant cost savings and others increased expenditures, depending on factors such as age and diagnosis. Taylor et al. 2007 study found significant cost savings; in 70% of cases, earlier introduction of hospice would have resulted in increased savings. Research on cost-effectiveness of palliative care outside of hospice model is not as well developed; Zimmermann et al. (2008) shows evidence for models other than hospice mixed. "In sum, although the evidence pertaining to the cost-effectiveness of palliative care is as yet scant, the clinically based arguments for a move away from the more restrictive "hospice vs. curative treatment" are compelling." [p 6]	Discusses factors that predict an increased likelihood of death and how to open communication with patients and family members.
GREY LITERATURE				
Anon. The debate in hospice care. <i>Journal of Oncology Practice</i> 2008;4(3):153-7	Editorial	Review of literature and data	Since 1974, tremendous growth in number of hospice programs in the U.S.; since 2000 number of for-profit hospice has increased until they account for 46% of programs. Despite growth, hospice has been underutilized and may be used ineffectively. Only 36% of people who died in 2006 were enrolled in a hospice program and physicians and patients tend to defer hospice until death is imminent.	Due to funding requirements for hospice care in Medicare, patients may have to choose between curative treatment and palliative care. Increased use of aggressive treatment within last weeks of life "demonstrates the decision-making challenges inherent in an oncology world distinguished by research advances: neither patients nor physicians want to "give up." [p 154]
Back AL, Li HR, Sales AE. Impact of palliative care case management on resource use by patients dying of cancer at a Veterans Affairs medical center. <i>J Palliat Med</i> 2005;8(1):26-35	U.S.	Retrospective non-randomized comparison of resource use using administrative data from one tertiary care VA medical center. All patients who died of cancer between Oct 1, 2001 – October 31, 2002; n=265.	Of 265 patients dying, 82 received palliative care services and 183 did not. Palliative care patients received case management for average of 79 days, tended to be younger, have more comorbid conditions and more likely to have chemotherapy in last 60 days of life. Variables associated with more acute care bed days in last 60 days of life included chemotherapy in last 60 days and length of stay on palliative care services < 60 days. Factors associated with fewer acute care bed days within last 60 days were being married and PCS LOS >60 days. Concludes that PCS for 60 or more days prior to death was associated with decreased use of acute care hospital resources.	Dollar values not cited.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Bailes JS. Cost aspects of palliative cancer care. <i>Semin Oncol.</i> 1995;22(2 Suppl 3):64-6.	U.S.	Review	Data on the cost-effectiveness of palliative cancer care mixed (article published in 1995). Some types of palliative care may increase costs while others may reduce overall cost of treatment. Pain management is an area that may have significant opportunity for cost savings if oral medications are used instead of high-technology methods.	
Barrett M, Wheatland B, Haselby P, Larson A, Kristjanson L, Whyatt D. Palliative respite services using nursing staff reduces hospitalization of patients and improves acceptance among carers. <i>Int J Palliat Nurs.</i> 2009;15(8): 389-95	Australia	Qualitative and quantitative study of using enrolled nurses to provide in-home respite for caregivers of palliative patients. Study patients compared to historical controls; appears that for 39 experimental patients (no controls could be found for 2 and they were excluded from comparisons), there were 1-4 matched control patients; exact number not given.	Caregiver concern over the quality of respite care providers has been found to be a common barrier to utilization. After adjusting for matching variables (age, sex and condition), patients receiving respite care were 80% less likely to be hospitalized than historical control ( $p < .001$ , $OR = 0.20$ , 95% CI 0.122-0.33). Of the patients who received respite all but one died at home and this patient preferred hospital; all historical controls died in hospital. Compared to hospital bed days among controls, respite program saved AUS\$34,375 over 25 weeks. Even after subtracting program costs, total savings would be AUS\$13,900. Cost of running the program in the region would be ~\$23,816 but would reduce cost of hospital bed days by \$71,500; total cost savings to health service would be \$47,684 per year. Qualitative research found higher caregiver satisfaction with the program and quality of care. Need for respite appears to be influenced by caregiver's family support systems; evidence that caregiver's anxiety, depression, reactions and perceptions have a greater effect on outcome and quality of life of patient than patient's condition.	Review of literature found little evidence that providing respite for palliative caregivers benefits patients or delays entry to residential or inpatient care. Studies have shown caregiver burden: anxiety, depression, guilt, insufficient rest and decreased personal time for leisure. In Australia, enrolled nurses work with registered nurses to provide basic nursing care; referred to in U.S. as "associate nurses," in U.K. as "auxiliary nurses," "health care assistants," "clinical support workers" or "nursing assistants." In Canada, this may be Licensed Practical Nurses or Registered Practical Nurse
Bendaly EA, Groves J, Juliar B, Gramelspacher GP. Financial impact of palliative care consultation in a public hospital. <i>J Palliat Med.</i> 2008;11(10):1304-8	U.S.	Charges, diagnosis-related groups (DRGs), DRG weight and demographics of 116 patients aged >50 who died in hospital, of whom 61 received a palliative care consultation; 55 did not. Patients in one U.S. hospital in 2005; 83% were Medicare or Medicaid.	Average length of stay was not significantly different for patients who received palliative care consultation vs. those who did not (14.4 vs. 12.2 days, $p = 0.57$ ). No significant variation of DRG weights within the same DRG; DRG weight significantly and positively correlated with charges. Both palliative care consultation and DRG weight were significant predictors of charges, explaining 36% of variability in charges. Median charges for palliative care consultation patients were \$35,824 vs \$42,731 for those who did not ( $p < .001$ ); approx. \$7,000 reduction in hospital charges. No difference in median DRG weights between groups. Concludes that palliative care consultation significantly reduced charges in adult patients who died during last hospitalization despite slightly longer average length of stay.	Cites sources that claim 46% of patients with life expectancy <6 month receive mechanical ventilation within 3 days of death; 50% of family members report relative experienced moderate to severe pain during last 3 days of hospitalization.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Boldy D. Economic appraisal in health care with particular reference to hospice and palliative care. <i>Aust Health Rev.</i> 1989;12(2):72-6	Australia	Descriptive	Explanation of difference between "cost-saving" and "economic efficiency" discussed: economic efficiency is concerned with making choices which maximize net benefit to society from available resources. Describes 3 steps in assessing costs and benefits of health care alternatives: 1) enumeration, 2) measurement, and 3) explicit valuation. Describe study in Perth in 1980s that found cost of an extensive GP-based hospice program is same as hospitalization but there were additional benefits such as increased choice for patient and family.	Published in 1989, so may not be relevant. Full article not available online.
Boni-Saenz AA, Dranove D, Emanuel LL, Lo Sasso AT. The price of palliative care: toward a complete accounting of costs and benefits. <i>Clin Geriatr Med.</i> 2005;21(1):147-63	N.A. (U.S.)	Literature Review	Description of methods for performing comprehensive cost-benefit analyses of palliative care and collecting information/data.	
Brody AA, Ciemins E, Newman J, Harrington C. The effects of an inpatient palliative care team on discharge disposition. <i>J Palliat Med</i> 2010;13(5):541-8	U.S.	Prospective study of patients admitted to large U.S. nonprofit multisite hospital June 2004-Dec 2007 seen by palliative care team or matched patient; n=361 matched pairs.	Controlling for patient demographics and disease severity, compared to usual care patients, those receiving palliative care team consultation were 3.24 times more likely to be discharged to hospice ( $p < .0001$ ), 1.52 times more likely to a nursing facility, and 1.59 times more likely to be discharged home with services ( $p < .001$ ). Patients receiving consultation were also more likely to be referred to hospice earlier in disease trajectory rather than in last few weeks of life.	Does not provide economic analysis but focuses upon likelihood of discharge destination.
Bruera E, Neumann C, Gagnon B, Brenneis C, Quan H, Hanson J. The impact of a regional palliative care program on the cost of palliative care delivery. <i>J Palliat Med</i> 2000;3:181-6	Canada		Implementation of a Regional Palliative Care Program for terminally ill patients reduced deaths in acute care facilities from 84% to 55%, number of dying patients receiving palliative care increased from 23% to 71%, and cost savings were estimated at CDN\$1,700,000.	
Bruera E, Suarez-Almazor M. Cost effectiveness in palliative care. <i>Palliat Med.</i> 1998;12(5):315-6.	Letter to the editor		Letter to the editor supporting palliative care on basis of being cost-effective.	
Bruera E, Yennurajalingam S. Palliative care in advanced cancer patients: how and when? <i>Oncologist</i> 2012;17(2):267-73	N/A	Review and case presentation as part of CME.	Summary of evidence regarding ability of palliative care to improve symptom control and quality of life and possibly extend survival, as well as to reduce cost of care. Use a case presentation to discuss impact of early palliative care access	

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Brumley R, Enguidanos S, Jamison P, Seitz R, Morgenstern N, Saito S, McIlwane J, Hilllary K, Gonzalez J. Increased satisfaction with care and lower costs: results of a randomized trial of in-home palliative care. <i>J Am Geriatr Soc</i> 2007;55(7):993-100	U.S.	RCT involved homebound, terminally ill patients (n=298) from 2 HMOs in 2 states with prognosis of approximately 1 year or less to live plus one or more hospital or ED visit in previous 12 months; randomized to usual care or in-home palliative care delivered by interdisciplinary team	Patients randomized to in-home palliative care were more satisfied with care at 30 and 90 days after enrollment ( $p < .05$ ) and were more likely to die at home ( $p < .001$ ). Palliative care subjects less likely to visit emergency department (20% vs. 33%, Cramer's $V = .15$ $p = .01$ ) or admitted to hospital (36% vs. 59%, Cramer's $V = .23$ $p < .001$ ) than usual care, resulting in significantly lower costs of care (33% lower, $p = .03$ , 95% CI $-\$12,411$ , $-\$780$ , $r^2 = 0.16$ ). After adjusting for survival, age and severity of illness, linear regression showed that enrollment in in-home palliative care reduced hospital days by 4.36 ( $p < .001$ , $r^2 = 0.14$ ) and ED visits by 0.35 ( $p = .02$ , $r^2 = 0.04$ ). Average cost per day $\$95.40$ for palliative care patients vs. $\$212.80$ for usual care ( $p = .02$ ).	Providing an interdisciplinary palliative care team within the home had a positive effect on patient satisfaction with medical care and reduced costs of care. Studies suggest end-of-life care programs should not be limited to last 6 months of survival as costs accrue over the last 2 years of life. In this study, there was a strong trend toward shorter survival for those in the palliative care group: may reflect who chooses pain and symptom relief and comfort care over aggressive treatment to extend life. Retrospective chart review of a sample of 90 study participants found palliative patients had fewer 911 calls and life-sustaining interventions conducted in the emergency department or ICU.
Bruner DW. Cost-effectiveness and palliative care. <i>Semin Oncol Nurs</i> . 1998;14(2):164-7. Review.	N/A (U.S.)	Review of literature (articles, book chapters and research studies) with a focus on palliative care and palliative chemotherapy for cancer	Descriptive review of the four types of economic studies, giving examples from cancer/palliative cancer care analyses. Examples focus on cost of chemotherapy treatments. Notes that no cost benefit studies have been conducted at point of this publication (1998); such an analysis would look at both costs and outcomes using the same measures.	Makes the point that allocating limited health care resources is becoming increasingly difficult and cost-utility analyses may provide a more objective means of decision making.
Ciemins EL, Blum L, Nunley M, Lasher A, Newman JM. The economic and clinical impact of an inpatient palliative care consultation service: a multifaceted approach. <i>Journal of Palliative Medicine</i> 2007;10(6): 1347-1355	U.S.	Multifaceted study: 1) time series analysis of pre/post palliative care costs for 128 palliative care (PC) patients; 2) matched cohort analysis comparing 27 PC to 127 usual care patients; and 3) analysis of symptom control after palliative consultation in 48 patients. Conducted in one large, private academic medical centre in San Francisco, 2004-2006.	In time series analysis of 128 PC patients, there was a 33% ( $\$892$ ) reduction in average total cost per day after PC consultation; variation in costs was also reduced significantly. After consultation, there were significantly fewer charges for ICU or CCU ( $p < .001$ ); shift to more charges attributed to pharmacy and physical and occupational therapies. In matched cohort analysis, mean daily costs for PC patients vs. usual care were 14.5% lower ( $\$2,022$ vs. $\$2,315$ , $p < .01$ ); total costs per admission were 19.2% lower ( $\$20,751$ vs. $\$24,725$ , $p < .001$ ). No difference in average length of stay (9 vs. 10 days). In third study on clinical outcomes ( $n = 48$ ), declines in pain and dyspnea scores were observed (no cost benefit conducted).	Time series analysis is not adjusted to account for fact that costs typically decline over the course of a hospital admission (trends in costs over time). If average reduction in cost was applied to this centre's annual population of terminal patients, cost savings of $\$2.2$ million/year estimated.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Connor SR. U.S. hospice benefits. <i>J Pain Symptom Manage.</i> 2009;38(1):105-9	U.S.	Review of U.S. usage data and funding policies.	n the U.S., as of 2009 over 1 million elderly Americans annually make use of hospice Medicare/Medicaid benefits; 13-fold increase over past 20 years. Access to these benefits include a prognosis of terminal illness with a life expectancy of 6 months or less as certified by two physicians; hospices are required to recertify <6 month prognosis at two 90-day intervals and thereafter every 60 days. National average length of service has increased over the years to more than 2 months but median has declined to 20 days; more long- and short-term periods of service. 95.6% of U.S. hospice care is delivered in home as routine home care. There is a cap on total hospice payments that can limit service. As of publication date (2009), 31% of all U.S. hospital provided some form of palliative care; proportion of hospices providing broader palliative services increased from 26% in 2002 to 55% in 2006.	People receiving hospice benefits under Medicare are not eligible to receive "curative" treatments. Hospice bills for each day care at one of 4 levels of care: 1) short-term inpatient (\$623/day), 2) inpatient respite (\$145/day), 3) continuous home care (\$817/day or \$34/hour for up to 24 hours), or 4) routine home care (\$140/day). Rates for wages adjusted to region (e.g., higher in urban centres).
Costantini M, Beccaro M. Health services research on end-of-life care. <i>Curr Opin Support Palliat Care.</i> 2009;3(3):190-4.	N/A	Literature review of research to evaluate palliative care services	Medical Research Council (U.K.) Framework for the evaluation of complex interventions is modeled after research used for drug development but uses a wider range of study methods. This approach has been used in some research on palliative care and has proved useful. Some experimental studies have looked at feasibility, effectiveness and cost of end-of-life care programs	Discussion of research methodologies and not necessarily cost-effectiveness outcomes. Argues there are 3 main approaches to analyses: 1) corporate (stakeholder point of view), 2) comparative, and 3) epidemiologic.
Coy P, Schaafsma J, Schofield JA. The cost-effectiveness and cost-utility of high-dose palliative radiotherapy for advanced non-small-cell lung cancer. <i>Int J Radiation Oncology Biology Physics</i> 2000;38(4):1025-33	Canada	Systematic review of studies comparing the effectiveness of different models of palliative care delivery: home care, care in inpatient hospices, or conventional oncology care. To be included, study had to compare at least two delivery methods.	Concludes that cost-effectiveness of high-dose palliative radiotherapy for advanced non-small-cell lung cancer compares favourably with other forms of treatment and which many other commonly-used medical interventions; as well, lies within U.S. \$50,000/QALY benchmark often used to define cost effective care. Baseline cost-effectiveness/cost-utility ratio for treatment \$9,245CDN per life year and \$12,837 per quality-adjusted life year (QALY) from the clinic perspective; from the societal perspectives costs were, \$12,263 per life year and \$17,012 per QALY. .	Cost-effectiveness of palliative radiotherapy – specific treatment for specific cancer (non-small-cell lung).

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Critchley P, Jadad AR, Taniguchi A, Woods A, Stevens R, Reyno L, Whelan TJ. Are some palliative care delivery systems more effective and efficient than others: a systematic review of comparative studies. <i>Journal of Palliative Care</i> 1999;15(4):40-47	N/A Canada	Systematic review of studies comparing the effectiveness of different models of palliative care delivery: home care, care in in-patient hospices, or conventional oncology care. To be included, study had to compare at least two delivery methods.	41 studies met the inclusion criteria but only 4 met a priori effectiveness criteria required to guide clinical or policy decision-making. All four were non-randomized comparative studies, 2 with contemporary and 2 with historical controls. Only one study reported on costs. It reported that traditional home care services were about 30% more costly to Medicare programs during the last 24 weeks of cancer illness than hospice home care or conventional oncology care (p<.001).	Narrative summary of results and there was no assessment for publication bias or estimation of between- or within-study variation.
Currow DC, Abernethy AP, Bausewein C, Johnson M, Harding R, Higginson I. Measuring the net benefits of hospice and palliative care: a composite measure for multiple audiences – palliative net benefit. <i>Journal of Palliative Medicine</i> 2011;14(3):264-5	Editorial	Letter to the editor on hospice and palliative care research.	The authors argue that there is need for integration of data from all four stakeholders (patients, caregivers, health professionals, and the health system) into a single composite outcome profile. This sort of measure is needed for process, outcome and costs data that can be used to advocate for current and future funding of hospice and palliative care.	Points out that single indicator should reflect the most frequently ignored cost of hospice/palliative care: informal caregiving.
Davies E. <i>What are the palliative care needs of older people and how might they be met?</i> Copenhagen; 2004; WHO Regional Office for Europe (Health Evidence Network report). <a href="http://www.euro.who.int/Document/E83747.pdf">http://www.euro.who.int/Document/E83747.pdf</a> Accessed 21/09/2012.	International	Systematic literature review	“Although further research is important, the more pressing issue is to implement existing knowledge and sustain improvements in palliative care practice throughout health care systems.” [p 4] States there is large unmet need for palliative services and reviews evidence of clinical and psychosocial benefits for patients and families.	Notes that Dutch health policy on palliative care may be the most advanced in Europe.  Does not provide evidence on economic benefits.

## GREY LITERATURE

Davis MP, Walsh D, LeGrand SB, Lagman RL, Harrison B, Rybicki L. The financial benefits of acute inpatient palliative medicine, an inter-institutional comparative analysis by All Patient Refined-Diagnosis Related Group and Case Mix Index. <i>J Support Oncol</i> 2005; 3:313-6	U.S.	Comparison of Cleveland Clinic's Inpatient Palliative Medicine (IPM) acute care unit's case mix index (CMI) and All Patient Refined-Diagnosis Related Group (APR-DRG) with national and 11 peer	Total mean charges per IPM unit admission were \$7,800 lower than at other peer institutions despite equivalent severity of illness, longer length of stay and higher mortality in the IPM unit. Lower charges were due primarily to lower laboratory and pharmaceutical charges. Mean charges at peer institutions varied greatly, from low of \$15,500 to high of \$57,100; mean for CCIMP was \$20,600, which was 27% less than the total mean. Compared to national average, CCIMP unit was 9% more expensive (\$20,600 vs. \$18,900) due to higher radiology charge (\$2,600 vs. \$2,000),	In the U.S., “Medicare payments for the last year of life range from 27% to 30% of the total Medicare budget. 1,2 Payments made during the last 60 days of life (at which time many patients would be hospice appropriate) account for 52% of total payments incurred in the last year of life. 1,2 Costs in the last year of life are 276% higher than they are
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REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
		institutional data (e.g. institutions such as Baylor University Medical Center, etc.).	medical/surgical supplies (\$1,900 vs. \$1,800) and longer length of stay (8.7 vs. 7.1 days); however, CCIPM had lower laboratory (\$1,600 vs. \$2,400) and pharmacy (\$3,000 vs. \$4,500) charges. Considers difference "remarkable in that our unit is located within a busy tertiary-care academic hospital, and the national APR-DRG is generated from predominantly primary- and secondary-level medical centers." [p.315]	for survivors of a similar age. 1 Between 13% and 18% of hospital admissions involve patients with advanced, incurable illnesses who are appropriate for palliative care service. 3,4 However, only 17%–18% of hospitals have palliative care consultative services, and only 6%–19% have an inpatient palliative medicine unit. 5,6 " [p 313]
Davis MP, Walsh D, Nelson KA, Konrad D, LeGrand SB, Rybicki L. The business of palliative medicine – Part 2: the economics of acute inpatient palliative medicine. <i>American Journal of Hospice &amp; Palliative Care</i> 2002;19(2):89-95	U.S.	Financial metrics from the Cleveland Clinic inpatient palliative medicine unit, ranging from 1997 to 1999.	Mean length of stay (LOS) was 7.2 days in 1997, 8.1 days in 1998 and 8.01 days in 1999. LOS was major determinant of financial viability; costs exceed revenues after day 10. Proportion discharged home with either palliative medicine outpatient clinic follow-up or home health care visits plus outpatient follow up was 74% in 1997 and 60% in 1998 and 1999. 27% discharged to hospice home care or long-term hospice inpatient units. Net revenues of unit have consistently exceeded direct costs. Major direct cost of care account for 55% of total cost: nursing care and pharmacy account for 75% of direct costs, with others including radiography, lab tests and radiation therapy.	The development of an international Case Mix Index (CMI) or All Patient Refined Diagnosis Related Group (APR-DRG) could make it possible to compare resource utilization, disease severity and outcome measures between different palliative inpatient units in different jurisdictions.
Di Cosimo S, Pistillucci G, Leggio M, Silvestria N, Moro C, et al. Palliative home care and cost savings: encouraging results from Italy. <i>New Zealand Medical Journal</i> 2003;116(1170):1-4	Italy	Letter to the editor describing cost description study conducted in Italy with 256 terminal cancer patients treated by one hospital-based palliative care unit delivering care in the home.	Authors estimate that program had an average cost of €35.5 per patient per day, which covered palliative care team, drug, supplies, nursing care, medical examination, specialist consultations and general practice fees. Compared to Italian Ministry of Public Health report that the cost of each in-hospital admission is approximately €310 per patient per day.	It is not clear whether it is justified to compare costs associated with select palliative care patients participating in program to general in-hospital daily cost.
Douglas HR, Halliday D, Normand C, Corner J, Bath P, Beech N, Clark D, Hughes P, Marples R, Seymour J, Skilbeck J, Webb T. Economic evaluation of specialist cancer and palliative nursing: Macmillan evaluation study findings. <i>Int J Palliat Nurs</i> . 2003;9(10):429-38	U.K.	Discussion from study of Macmillan specialist cancer nursing in U.K.; 76 cases studies of patients referred to 12 specialist cancer and palliative home- and hospital-based nursing teams	Patients who reported better nursing outcomes had higher proportion of specialist nursing interventions than those reporting poor nursing outcomes (45% vs. 25%). Overall pattern of health care use differed in patients reporting positive nursing outcomes. Data is used to support hypothesis that specialist nurses can influence cost-effectiveness of care. However, there was no control group so true comparisons cannot be made.	Argument for specialist palliative care nurses but as there was no control, results are not definitive. Outcomes were nursing related rather than economic or patient-related (e.g., not costs or patient quality of life). Concerns specific type of nurses – Macmillan nurses are nurses trained in specialist palliative care services.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Douglas HR, Halliday D, Normand C, Corner J, Bath P, Beech N, Clark D, Hughes P, Marples R, Seymour J, Skilbeck J, Webb T Economic evaluation of specialist cancer and palliative nursing: a literature review. <i>Int J Palliat Nurs.</i> 2003;9(10): 424-8.	N/A U.K.	Literature review; 17 studies met inclusion criteria. All but one study focused on direct patient care rather than other clinical nurse specialist roles and were undertaken as part of effectiveness studies. Studies were of poor quality.	Economic evaluations considered only a few types of costs but a wide range of outcomes. None of the studies reported cost-effectiveness ratios. Interventions by clinical nurse specialists were reported to be less costly and more effective than alternative forms of care.	There is insufficient economic evidence to justify the use of specialist cancer and palliative nurses specialists, although there is poor quality evidence suggesting it may be helpful.
Douglas HR, Normand CE, Higginson IJ, Goodwin DM, Myers K.. Palliative day care: what does it cost to run a centre and does attendance affect use of other services? <i>Palliat Med</i> 2003;17(7):628-37	U.K.	Cost and resource use data, both paid and unpaid, from 5 palliative day care centres in southern England. PDC group consecutive new referrals well enough to be interviewed; comparison group recruited from home care teams. Data collected at baseline, 6-8 weeks and 12-15 weeks.	Palliative day care cost ~£54/person/day in 1999, rising to £75 if included unpaid resources. PDC patients accessed few services other than those offered through the PDC program. Comparison patients did not access similar services elsewhere (i.e., went without services). Suggestion that PDC might substitute home nursing and GP care at least three months before death (i.e., does not duplicate services) but data is inconclusive. Inpatient care negligible for both groups. A full economic evaluation could not be conducted without robust evidence of effectiveness of PDC. PDC centres reduced costs by sharing resources with inpatient units and making use of unpaid resources. Gives information on number of visits/events but does not present monetary/cost values.	"Like other forms of palliative care, day care presents a challenge for economic evaluation as it does not conform to many of the criteria needed to perform standard economic evaluations." [p. 628] Depending upon patient needs can involve multiple services across disciplines; aims are different than most health interventions; there is no single measure of outcome for calculating cost-effectiveness ratio. As well, large clinical trials of PDC have not been conducted so there is little or no information for economic evaluations, such as effectiveness. In this study, PDC patients valued the service and were satisfied but there were no associated changes in quality of symptom management or quality of life.
Dumont S, Jacobs P, Turcotte V, Anderson D, Harel F. The trajectory of palliative care costs over the last 5 months of life: a Canadian longitudinal study. <i>Palliat Med</i> 2010;24:630-40	Canada: 160 patients from 5 urban settings	In-person and follow up telephone interviews with 160 terminally ill patients and their main informal caregivers. Prospective,	Overall cost of care increased from fifth to last month of patients' life, with a large proportion due to inpatient care which are assumed by provincial health care system. Among outpatient costs, largest increase was for home care; informal care costs were particularly high over last 3 months. 46% of patients were hospitalized during the study, with an average of 1.4 (1.1) admissions; 12% of patients had long-term care stays. Mean	Most studies have focused on societal or family costs and have been limited to one type of expenditures such as hospitalization, home care or hospice care. This study tried to capture provincial health insurance costs as well as those paid by the

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REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
		multi-centred, longitudinal, observational	inpatient hospital care costs increased from \$580 (sd=3014) or 23.7% of total costs 5 months prior to death to \$4,152 (7959) or 53.5% of total costs in month prior to death. Outpatient care increased from \$1,344 (1946) to \$2,285 (3,403) but proportion of total costs dropped from 55.0% in month 5 to 29.4% in month prior to death. Value of informal caregiving time increased from \$521 (915) to \$915 (1,363) but decreased from 21.3% to 11.8% of total. Total costs were \$2,445 (4,322) in month 5 and \$7,765 (8,538) in month prior to death.	family, not-for-profit organizations and other organizations; costs included not just services and goods but transportation, out-of-pocket costs and informal caregiving.
Dumont S, Jacobs P, Fassbender K, Anderson D, Turcotte V, Harel F. Costs associated with resource utilization during the palliative phase of care: A Canadian perspective. <i>Palliat Med</i> 2009;23(8):708-717	Canada	Cohort of 248 patients registered in community-based palliative care programs and their main informal caregivers from 5 programs in urban centres across Canada. Prospective research with interviews at 2-week intervals until patient death or maximum of 6 months.	Public health care system paid for 71.3% of palliative care costs, the family 26.6% (17.0% out-of-pocket, 6.7% for home medical equipment or aids, and 4.4% home care) and not-for-profit organizations 1.6%. Largest cost component was inpatient hospital stays (33.2%; \$6,125 95% CI \$4,600-7,650), followed by home care (18.7%, \$3,456 95% CI \$2,075-4,838), and ambulatory care (7.9%, \$1,466 95% CI \$1,218-1,714). For public health system, main cost was inpatient hospital care (46.6%), followed by home care (24.5%) and ambulatory care (10.8%). Other total costs were: long-term care (3.8%), transportation (1.6%), prescription medication (6.5%), medical equipment and aids (6.0%), out-of-pocket costs (4.6%) and caregiving time costs (17.6%). Total costs were \$18,446 (95% CI \$16,048-20,844). Mean daily cost per patient also reported. For public health system, mean was \$144.8/day (95% CI 112.3-188.3), for family \$53.9 (95% CI 42.8-65.1), not-for-profits \$3.3 (95% CI 2.0-4.6), and for other \$1.1 (95% CI 0.5-1.7). Total mean daily cost/patient was \$203.2 (95% CI 163.0-243.4). Public health system covered 100% of inpatient care costs and almost all of ambulatory care and long-term care costs as well as 94% of prescription medication costs. Care received in home almost equally shared between public health system and family (48.1% and 51.7%). Out-of-pocket costs 99% covered by family; costs related to home medical equipment/aids shared between public health system (36.2%), family (29.5%) and not-for-profits (26.8%).	Results similar to Penrod et al. study published in 2001, in that in both studies >40% of costs covered by public health system due to hospital stays. States there is growing body of literature suggestion programs largely based on home care, including palliative programs, are cost saving for public health system but may be shifting costs to patients and their families. Provides cost estimation of resources (e.g., inpatient hospital care=\$1,044/day, ambulatory care=\$313/visit, primary care \$98/visit, etc.). Mean daily cost per patient \$144 (95% CI 112.3-177.3) for public health system, \$53.9 (42.8-65.1) for family, 3.3 (2.0-4.6) for not-for-profits, and 1.1 (0.5-1.7) for others, for a total of \$203 (95% CI 163.0-243.4). Largest mean cost per day per patient was inpatient hospital care (67.6 95% CI 46.8-88.3), followed by home care (38.0, 22.0-54.1), caregiving time costs (35.8, 28.0-43.6), ambulatory care (16.1, 13.1-19.2), prescription medications (13.2, 10.3-15.9), medical equipment/aids (12.3, 9.5-15.0), out-of-pocket costs (9.3, 6.2-12.4), long-term care (7.8, 3.2-12.3) and transportation (3.2, 2.3-4.1).

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Elsayem A, Swint K, Fisch MJ, Palmer JL, Reddy S, Walker P, Zhukovsky D, Knight P, Bruera E. Palliative care inpatient service in a comprehensive cancer center: clinical and financial outcomes. <i>J Clin Oncol</i> 2004;22 (10):2008-2014	U.S.	Retrospective analysis of computerized database for clinical and demographic information, LOS and hospital billing during the first year of operation of a Palliative Care Inpatient Services (PCIS) at a comprehensive cancer center.	320 cancer patients admitted during the study period; median age 57 years. Main referral symptoms pain (44%), nausea (41%), fatigue (39%) and dyspnea (38%). Median length of stay 7 days (1-58 days). 49 patients died in PCIS; overall hospital mortality rate similar to that in year before the PCIS was established (3.58% vs. 3.59%). Mean reimbursement rate for all palliative care changes 57% and mean daily charge in PCIS 38% lower than rest of the hospital. Symptom intensity data showed severe distress on admission and significant improvement in main target symptom(s). Most patients were discharged to a hospital. Concludes that PCIS showed both clinical utility and financial viability.	Under Medicare reimbursement requirements, those receiving hospice benefits cannot receive cancer therapy; moreover level of medical care and access to laboratory and diagnostic imaging services required would make it unsafe to administer most cancer therapies to patients within existing hospice system. Thus, an inpatient palliative service may be useful to address this gap and was considered acceptable by most oncologist clinicians. At the same time, need for specialty, dedicated unit away from treatment wards; nurses in particular felt overwhelmed by care and emotional needs of palliative patients and families and wanted to focus on cure and highly technical tasks in administrating chemotherapy. Need clinicians (e.g., nurses) that understand and want to work in palliative model. Reimbursement issues with insurance companies, as reviewers equated palliative care with hospice and so didn't want to pay for acute inpatient care/chemotherapy.
Falls CE. Palliative health care: cost reduction and quality enhancement using end-of-life survey methodology. <i>J Gerontol Soc Work.</i> 2008;51(1-2):53-76	U.S.	Narrative review/ editorial	"Armed with unprecedented access to medical information, a more knowledgeable and assertive patient population has emerged in the 21st century to institute its own standards of what constitutes quality health care. In terms of end of life care, this has meant recognition that the emotional needs of the dying have been largely underserved by the current American medical model. Patients and their families are no longer willing to accept the traditional medical perspective of death as failure and have numerous international palliative care models that serve as benchmarks of success when it comes to quality of dying. When cure is a possibility, Americans will pursue it at all costs, but when it is not a possibility, they want honest communication and the opportunity to say good-bye to their loved ones. In the context of these emergent needs, life review is offered as a solution."	Discussion of utilization of an end-of-life survey. Starts with good review of existing literature.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Fassbender K, Fainsinger RL, Carson M, Finegan BA. Cost trajectories at the end of life: the Canadian experience. <i>J Pain Symptom Manage.</i> 2009;38(1):75-80	Administrative data from Alberta Canada 1999-2002.	Analysis of 2 years of mortality and health care utilization and costs data from administrative databases for 3 annual cohorts of permanent residents. Study focuses on societal health care costs and does not include informal caregiving or costs paid by other parties.	Death in Alberta classified as due to organ failure (30.5%), frailty (30.2%), terminal illness (29.8%), includes cancer, end-stage renal diseases, ALS, AIDS), sudden death (7.1%) and other causes (2.3%). Inpatient care was the primary cost driver in all trajectories but trajectories of costs were significantly different. For 2002, costs were highest for organ failure (\$39,947), followed by terminal illness (36,652), frailty (\$31,881) and lowest for sudden death (\$10,223). Costs increased for all categories over the 3-year period. For terminal illness, up to 70% of costs due to inpatient care whereas up to 30% of costs due to long-term care for organ failure and frailty groups. Physician and ambulatory costs greater for the sudden death group. UP to 90% of terminally ill patients are hospitalized in last year of life and 33% in second-last year of life. Drug costs are not significant in these trajectories, although they are increasing.	Points out that in Canada, end-of-life care policies are based on average six-month decline in functional status and thus potential costs savings from reducing unnecessary treatments for cancer patients. However, noncancer patients with different "trajectories of dying" can benefit from end-of-life care. Although it is recognized that health care costs escalate rapidly for cancer patients in the last 6 months of life, there are also significant increases in costs for patients dying of organ failure and frailty. End-of-life costs for combined organ failure and frailty patients during last two years of life combined are much higher than that of cancer patients. Need to be aware of the importance of these populations for health care services even though their disease trajectories are less predictable than that of cancer patients (tend to be chronic diseases with intermittent acute episodes). Argues it is reasonable to focus efforts on finding efficiencies such as reducing inpatient hospital costs by increasing hospice and home care services and treating frail patients in long term care.
Finlay IG. Developing a template to plan palliative care services: the Welsh experience. <i>J Pain Symptom Manage.</i> 2009;38(1):81-6	Wales	Description of palliative care service funding and plan for Wales under National Health Services.	In Wales, palliative care is funded by the government but services are provided by the voluntary sector. A plan was developed to ensure access across the population (e.g., urban/rural). Where hospice inpatient beds exist, a reimbursement funding formula was developed for basic care costs. Where there are no beds, hospice-at-home services may provide an alternative model of care, with funding adjusted pro rata. To quality for specialist team funding, teams must meet specialist education standards, act as a resource to generalist teams, and use a core clinical data set to support comparable audits against agreed all-Wales standards. Issues in trying to calculate area of specialist service need include: rural vs. urban setting (and associated transportation issues); economic deprivation status, population age, socially isolated vs. established and integrated communities, ability of population to articulate their needs vs. social exclusions, variations in standardized mortality rates and disease prevalence,	"To establish equity, there needs to be a formula of funding for services. The formula needs to be equitable in terms of palliative care needs, must recognize regional differences, and take into account the different levels of statutory funding that providers have obtained historically. For planning, the term hospice service has been taken to mean a specialist palliative care service, however it is funded or provided." [p. 82] Makes the point that when young people are terminally ill, they often have more complex problems and issues, including having young children. Estimates of regional needs have been estimated by looking at

continues on next page

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
			variation in provision of community nursing and after-hours primary care services, proximity to major specialist disease centres, and competencies of generalist staff and the effects of rapid staff turnover. Estimates derived suggest that you need one consultant for every 300,000 population/20 hospice beds/40 cancer centre beds/850 general hospital beds. Need one clinical nurse specialist for every 50,000 population/7.5 hospice beds/30 cancer beds/ 300 general hospital beds. Number of associated health care professionals not calculated. Need one bed per 15,000 population.	epidemiologic data (including mortality data), demographic data such as deprivation indices and distribution of patient beds (e.g., English model of cost-effective palliative units as consisting of 10-bed inpatient units is not feasible in smaller Welsh hospital system).
Garcia-Perez L, Linetova R, Martin-Olivera R, Serrano-Aquilar P, Benitez-Rosario MA. A systematic review of specialized palliative care for terminal patients: which model is better? <i>Palliat Med</i> 2009;23(1):17-22	N/A (Canary Islands)	Systematic literature review; 6 systematic reviews, three studies on effectiveness (in 4 publications), and 1 cost study retrieved. Studies excluded children, chronic or disabled but non-terminal patients, patients with dementia or Parkinson disease, and patients with neuromuscular diseases. Studies had to compare at least 2 different specialized palliative care programs.	All three systematic reviews concluded that specialized palliative care is more cost-effective than conventional care. Methodological limitations and heterogeneity of programs did not make it possible to draw conclusions about the relative cost-effectiveness of specific models.	Several systematic review have reported higher effectiveness of specialized palliative care but have been based on few and not high-quality studies. Current review included five articles based on 4 original studies comparing 2 or more specialized palliative care programs: in total 7 models of care studied. No studies found any one program was more effective or cost-effective than the other (e.g., no differences between hospital- and home-based hospice). Ethical concerns may be a limitation to conducting more research in this area.
Gomes B, Harding R, Foley KM, Higginson IJ. Optimal approaches to the health economics of palliative care: report of an international think tank. <i>J Pain Symptom Manage.</i> 2009;38(1):4-10	N/A (U.K. & U.S.)	Editorial/report of international think tank on studying health economics of palliative care hosted by Cicely Saunders International, King's College London Department of Palliative Care, Policy and Rehabilitation, and the Open Society Institute.	Report of discussions between 40 international researchers, health economists, policy makers and advocates on experiences, concerns and recommendations in palliative care economic research. Available services do not reach all who could benefit and aging populations pose tougher challenges in sustainability. Canada, like U.S., U.K., Australia, etc., rated as having highest level of palliative care development as it is approaching integration. Costs of institutional, community and informal palliative care have yet to be broken down, leaving questions for funding, costing, evaluating and modeling. Countries vary in terms of who is entitled to palliative care, when it is offered and what is included in care package. It is important that economic evaluation show impact of palliative care on families, which requires improvements in measurement of informal care costs.	Methodologic issues in economic analyses: 1) linking cost perspective (e.g., health care system, societal, families) to relevant level of decision-making; 2) identify variety and types of costs, including opportunity costs; 3) determining most appropriate type of economic evaluation .

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Gomez-Batiste X, Tuca A, Corrales E, Porta-Sales J, Amor M, Espinosa J, Borrás JM, de la Mata I, Castellsague X on behalf of Grup de Evaluacion-SECPAL. Resource consumption and costs of palliative care services in Spain: a multicenter prospective study. <i>J Pain Sympt Manage</i> 2006;31(6):522-532	Terminal-stage patients receiving palliative care services in Spain	395 cancer palliative patients were recruited from 171 participating palliative care units. Resource consumption and costs evaluated for 16 weeks of follow up and compared to 1992 study to assess change over time. Prospective, multi-centred, longitudinal, observational. Non-cancer patients excluded.	Most frequent health care interventions were home care visits, hospital admissions and patient-consultant phone calls. The palliative care units provided 67% of all services and consultation interventions for 91% of patients. Compared to 1992, there was a significant shift from convention hospital beds towards palliative care beds, reduced hospital stay (from 25.5 to 19.2 days, $p=.002$ ), increase in death-at-home option (from 31% to 42%), lower use of hospital emergency departments (from 52% to 30.6%, $p-.001$ ), and increase in programmed care. Compared to resource consumption in 1992, palliative care services were associated with a cost saving of 61% with no compromising of patient care. Median survival time from first PCS visit was 6 weeks and 42% of patients died at home, 41% in conventional hospital ward and 17% in palliative in-patient centre. Main reasons for visiting emergency departments were symptom control (69%) and terminal stage disease (13%); 98% of patients used the telephone to report condition or get information or support. Median length of hospital stay was 19.2 days for those in acute hospital, 10.7 days for palliative care units in acute hospitals, and 29.8 days for palliative care units in health care centres. Compared to historical study, there were significantly fewer hospital admissions (72% vs. 58%, $p<.001$ ) and mean hospital stay decreased (from 25.5 days to 19.9 days, $p=.002$ ). There was also reduction in use of emergency departments from 52% to 30.6% ( $p<.001$ ). Total cost per patient was €1,963 in current study, vs. 5,068 in historical study; this implies an estimated saving for the hospital of €3,105 per patient (NB: there appears to be an error in text; figures taken from table).	Palliative care has been a government priority in Spain since early 1990s; there is only one recognized independent hospice in Spain. Cost and cost-effectiveness studies have reported palliative care is highly efficient compared to conventional care in reducing inappropriate use of acute hospital beds and emergency departments; hospital palliative care beds have lower unit cost compared with conventional medical beds. Hospitals with active outpatient clinics tended to recruit patients earlier in the disease process, while those having only an inpatient unit or whose work was focused in the community tended to be called in the later stages of the disease. Introducing more outpatient clinics or day-care hospitals could result in earlier intervention and more flexible approaches in care of patients. Findings regarding homecare team similar to other published studies and reflect difficulties in modifying health care procedures and practices in isolated teams working exclusively in the community. Overall, evidence that palliative services in Spain are still focused too much on later stages of the disease. Main reason for patient referral to specialized palliative care team for hospital-based services is usually symptom control.
Goodwin PJ, Shepherd FA. Economic issues in lung cancer: a review. <i>J Clin Oncol</i> 1998;16(12):3900-12	N/A Canada	Review of economic literature	Per-patient cost to treat lung cancer is substantial with the major cost being hospitalization. Palliative or terminal treatment is associated with significant costs. Savings can be obtained through judicious diagnostic and staging. Combined modality treatment approaches and the palliative use of combination chemotherapy appear to be associated with acceptable cost-effectiveness compared with commonly used therapies for other diseases.	

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Gordon R, Eagar K, Currow D, Green J. Current funding and financing issues in the Australian hospice and palliative care sector. <i>J Pain Symptom Manage.</i> 2009;38(1):68-74.	Australia	Description of National Palliative Care Strategy of Australia (national and state joint strategy).	Like Canada, inpatient and community services are a state/territorial responsibility so there is no national model. Funding arrangements developed in Australia are described. Authors argue that it is critical for flexible funding and financing models to be developed, as well as means of identifying, classifying and costing palliative care patients. Casemix classification such as Australian National Subacute and Nonacute Patient (AN-SNAP) system is starting point but further work is required. National Palliative Care Strategy (~AU\$245 million) funded research, development of resource materials, community access to subsidized medication, respite care, and projects to improve understanding of palliative care in the community. In Australia, two types of casemix costing are routine: cost modeling (cost estimates produced at casemix class level) and clinical or patient costing (cost of each patient episode of care is individually estimated). Clinical costing systems are more expensive as they require IT investment and data collection.	Acute care if treatment-driven by patient's medical diagnosis and classified by diagnosis-related groups (DRGs). Subacute care is defined as treatment driven primarily by patient's functional status and quality of life, rather than underlying medical diagnosis; all palliative care is classified as subacute. Palliative care is a state/territorial responsibility but most have developed strategic plans or frameworks, even though services may be delivered through a mix of public, non-government and private sectors. Different states use different formula for funding community-based palliative care services (e.g., New South Wales formula adjusts for age, sex, premature cancer rates and availability of private sector services).																																																																											
Guerrier DN, Zagorski B, K, Masucci L, Librach L, Coyte PC. Cost variations in ambulatory and home-based palliative care. <i>Palliat Med</i> 2010;24(5):523-532	Canada	Assessment of societal cost of home-based palliative care and patient characteristics explaining variation. 136 family caregivers interviewed every 2 weeks from time of palliative referral until death and information on out-of-pocket and informal caregiver expenses documented.	Mean monthly cost per patient was CDN\$24,549 (2008 dollars). Family caregivers' time costs comprised 70% of costs. Multivariable linear regression found costs were greater for patients who had lower physical functioning (p<.001), lived with someone (p=.007) and when approaching death (p=0.021). Total cost of care increases as time to death declines. Table provides breakdown of costs. Total for public health care system \$6,396/month/patient. Total private costs (out-of-pocket, 3rd-party insurers and caregiver time loss) \$17,465/month/patient reporting; slightly lower \$17,452/month/patient for entire sample.	<table border="1"> <thead> <tr> <th>Funding source and service</th> <th>Mean \$ for those reporting</th> <th>Mean \$ for total sample</th> </tr> </thead> <tbody> <tr> <td>Public health</td> <td></td> <td></td> </tr> <tr> <td>Home-based appts</td> <td>5,086</td> <td>5,086</td> </tr> <tr> <td>Ambulatory appts</td> <td>406</td> <td>296</td> </tr> <tr> <td>Hospitalizations</td> <td>3,986</td> <td>630</td> </tr> <tr> <td>Medications</td> <td>280</td> <td>237</td> </tr> <tr> <td>Supplies &amp; equip</td> <td>207</td> <td>45</td> </tr> <tr> <td>Total Public:</td> <td>6,396</td> <td>6,396</td> </tr> <tr> <td>Private/out-of-pocket</td> <td></td> <td></td> </tr> <tr> <td>Home-based appts</td> <td>1,813</td> <td>427</td> </tr> <tr> <td>Ambulatory appts</td> <td>98</td> <td>6</td> </tr> <tr> <td>Paid household work</td> <td>695</td> <td>66</td> </tr> <tr> <td>Medications</td> <td>94</td> <td>87</td> </tr> <tr> <td>Supplies &amp; equip</td> <td>127</td> <td>73</td> </tr> <tr> <td>Travel</td> <td>39</td> <td>28</td> </tr> <tr> <td>Total Private:</td> <td>698</td> <td>688</td> </tr> <tr> <td>3<sup>rd</sup> party insurers</td> <td></td> <td></td> </tr> <tr> <td>Home-based appts</td> <td>193</td> <td>6</td> </tr> <tr> <td>Medications</td> <td>158</td> <td>7</td> </tr> <tr> <td>Total 3<sup>rd</sup> party:</td> <td>172</td> <td>13</td> </tr> <tr> <td>Caregiver lost time</td> <td></td> <td></td> </tr> <tr> <td>Labour market</td> <td>2,210</td> <td>686</td> </tr> <tr> <td>Leisure</td> <td>16,721</td> <td>16,721</td> </tr> <tr> <td>Employed time loss</td> <td>2,220</td> <td>65</td> </tr> <tr> <td>Total time</td> <td>17,452</td> <td>17,452</td> </tr> </tbody> </table>	Funding source and service	Mean \$ for those reporting	Mean \$ for total sample	Public health			Home-based appts	5,086	5,086	Ambulatory appts	406	296	Hospitalizations	3,986	630	Medications	280	237	Supplies & equip	207	45	Total Public:	6,396	6,396	Private/out-of-pocket			Home-based appts	1,813	427	Ambulatory appts	98	6	Paid household work	695	66	Medications	94	87	Supplies & equip	127	73	Travel	39	28	Total Private:	698	688	3 <sup>rd</sup> party insurers			Home-based appts	193	6	Medications	158	7	Total 3 <sup>rd</sup> party:	172	13	Caregiver lost time			Labour market	2,210	686	Leisure	16,721	16,721	Employed time loss	2,220	65	Total time	17,452	17,452
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Guest JF, Ruiz RJ, Greener MJ, Trotman IF. Palliative care treatment patterns and associated costs of health care resource use for specific advanced cancer patients in the U.K. <i>Europ J Cancer Care</i> 2006; 15(1):65-73	U.K.	Analysis from perspective of U.K.'s NHS. Dataset of 547 patients with malignant neoplasm, following treatment & costs from time they started strong opioid treatment until death. Unit costs at 2000/2001 prices.	Mean duration from cancer diagnosis to start of strong opioid treatment ranged from 0.7 years for lung cancer to 5.4 years for breast cancer. Length of palliative care ranged from 180 (lung) to 372 (breast) days. Statistically significant differences in resource use between patients with different cancer type but reflected in part varying duration of palliative care, as well as monthly number of primary care visits. No apparent relationship between length and corresponding cost of palliative care: ranged from £1,816 for colon cancer to £4,789 for ovarian cancer. On average, a third of all patients received 4-hourly morphine as part of initial strong opioid treatment.	Primary cost drive of palliative care was hospitalization, accounting for 35%-77% of total costs. GP visits accounted for 6-15% and district nurse visits 7-17%. Strong opioids accounted for 6-13% of total cost. Total non-drug resource use per patient (£): 1,750 for breast, 1,537 for colon, 2,247 for lung, 1,821 for uterine, 4,236 for ovarian, 2,678 for prostate, and 3,177 for stomach/esophageal. Total drug cost per patient: 732 for breast, 278 for colon, 375 for lung, 872 for uterine, 553 for ovarian, 1,088 for prostate, and 316 for stomach/esophageal. Mean cost per patient (£): 2,482 for breast cancer, 1,816 for colon, 2,522 for lung, 2,693 for uterine, 3,789 for ovarian, 3,765 for prostate, and 3,494 for stomach/esophageal. Higher palliative care costs for ovarian cancer may be explained by the fact that it is often not detected until advanced stages.
Harding R, Gomes B, Foley KM, Higginson IJ. Research priorities in health economics and funding for palliative care: views of an international think tank. <i>J Pain Symptom Manage</i> . 2009;38(1):11-4	N/A (U.K. & U.S.)	Editorial/description of research priorities from an international think tank	Recommendations for research in health economics of palliative care include international comparative research into the components of care and settings, evaluative studies, methodologic development and strategies to initiate studies, and making better use of administrative data.	"As palliative care expands in response to the inadequate levels of provision (in both resource-rich and resource-poor settings), high-quality, robust research evidence is needed to identify any cost benefit of palliative care in terms of outcomes for patients and families, and to inform appropriate allocation of scarce resources." [p. 11]
Hatziandreu E, Archontakis F, Daly A in conjunction with the National Audit Office. <i>The Potential Cost Savings of Greater Use of Home- and Hospice-based end of life care in England</i> . Cambridge; RAND Corporation; 2008.	U.K.	Review of the literature and economic modeling	Literature review found "consistent and robust evidence" palliative care reduces symptom burden and improves satisfaction and quality of life of patients and caregivers; almost all studies looking at cost find economic benefits. Evidence of economic benefit clearer for cancer patients and largely from U.S.. Savings result from fewer hospitalizations and reduce use of ICU resources. [p xiv] Modeling of reduction in unplanned emergency admissions and days spent in hospital that could be achieved by provision of palliative care. When different reductions in admission (5-20%) and LOS (1-5 days) were modeled, it was estimated that expenditures could be reduced between £42-171 million per year. Results are consistent with evidence from the literature.	Palliative care has the potential to release substantial amount of health care resources, which as a result could be used to better meet patients' wishes as they approach end of life. There is room for improvement in providing palliative care services to patients suffering from conditions other than cancer, such as organ failure. Reinforces the need for expanding patient-centred forms of care.
GREY LITERATURE				

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Haycox A. Optimizing decision making and resource allocation in palliative care. <i>J Pain Symptom Manage.</i> 2009;38(1):45-53	U.K.	Narrative/ editorial review focusing upon issues facing U.K. National Health Service.	Optimizing resource allocation in palliative requires two types of health economic analysis: 1) determine efficiency of allocating scarce health resources to palliative care; 2) ensuring optimum efficiency of funds allocated so there is greatest possible patient benefit (allocation and technical efficiency). Clinical and cost-effectiveness of different interventions depend on a range of factors such as local leadership, teamwork, training, strategic and operational environments; each must be analyzed in detail before conclusions can be drawn about their generalizability to different circumstances and settings. Assessing generalizability requires the development of an impact model to identify those elements which are locally dependent (e.g., a charismatic project leader) and those that are transferable between locations (e.g., improved organizational structures and methods).	Demand for palliative care largely determined by age, social deprivation and ethnicity of local population; level and nature of resources will depend on current structure and quality of existing services. "Need" to invest additional resources exists when patients meet eligibility criteria but are unable to access services or not provided with preferred type of high-quality care. Comparing individual elements of local palliative care such as number of inpatient beds to national standards makes little sense because of the interdependence of local services. Although physical and psychological well-being can be quantified as outputs, it is difficult to measure social and spiritual dimensions of care (including bereavement support for families) that contribute significantly to overall quality of life.
Heap K. Cost effectiveness in specialist palliative care. <i>Int J Palliat Nurs</i> 2012;18(1): 48	Letter to the editor regarding Mula et al. article		Agreeing with Mula and Raftery editorial	
Hearn J, Higginson IJ. Do specialist palliative care teams improve outcomes for cancer patients? A systematic literature review. <i>Palliat Med.</i> 1998;12(5):317-32.	N/A U.K.	Systematic literature review of 18 studies, including 5 RCTs. Studies looked at symptom control, patient/family or caregiver satisfaction, health care utilization and cost, place of death, psychosocial indices, and quality of life.	Studies showed specialist care from multiprofessional palliative care team improved outcomes in amount of time spent at home by patients, satisfaction by patients and their caregivers, symptom control and patients' likelihood of dying where they wish. Palliative care team also associated with reduction in number of inpatient hospital days and overall costs.	

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Higginson IJ, Costantini M, Silber E, Burman R, Edmonds P. Evaluation of a new model of short-term palliative care for people severely affected with multiple sclerosis: a randomised fast-track trial to test timing of referral and how long the effect is maintained. <i>Postgrad Med J</i> 2011;87:769-775	U.K.	Recruitment of 52 palliative patients with severe multiple sclerosis; randomized into immediate (fast-track) palliative care or PC after 12 weeks (control group). All patients had high level of disability. Study measured symptom management and caregiver burden (Zarit Burden Interview). Secondary analysis of a phase II RCT.	Palliative care delivered on average of three visits by a multiprofessional team; all care completed by six weeks. Receiving PC earlier had a similar effect on reducing symptoms than receiving it later; however, earlier PC reduced caregiver burden. Study lacked power to detect small differences. Effect of early palliative care is maintained for 6 weeks after withdrawal and then appears to fade. In the primary study (of which this is secondary analysis), group that received PC at 12 weeks had lower costs compared to control group (£1,789, bootstrapped 95% CI -£5,224 to £1,902).	Concludes that short-term palliative care is beneficial regardless of whether patient is referred earlier or later. Benefits include symptom management and relieve of caregiver burden. Effects wane after palliative care is withdrawn although exact timeframe is unclear.
Higginson IJ, Finlay IG, Goodwin DM, Hood K, Edwards AGK, Cook A, Douglas H, Normand CE. Is there evidence that palliative care teams alter end-of-life experiences of patients and their caregivers? <i>J Pain Sympt Manag</i> 2003;25(2):150-68	N/A U.K.	Systematic literature review (44 studies), meta-regression (26 studies) and meta-analysis (19 studies). Quality of studies mostly Grade II or III (good to fair). Slight publication bias detected.	Meta-regression showed small positive effect for palliative care on patient outcomes, independent of team composition, patient diagnosis, country or study design. Meta-analysis demonstrated small benefit on patients' pain (OR=0.38, 95% CI 0.23, 0.64), other symptoms (OR=0.51, 95% CI 0.30, 0.88), and a non-significant trend for satisfaction and for fewer therapeutic interventions. 14 studies contained some economic analysis but only one provided full economic cost-benefit evaluation.	13 of the 14 studies with economic information could be described as cost-minimization studies as they only provided information on cost/resource use. Three conducted from societal perspective and 2 looked at costs to patients and families. Results were heterogeneous and lack methodological detail. Some evidence to suggest substitution effects between hospital and home care, reducing number of inpatient days and associated health care costs. Differences in length of hospitalization explained most of the variance in cost. Three studies failed to find savings that were anticipated.
Higginson IJ, McCrone P, Hart SR, Burman R, Silber E, Edmonds PM. Is short-term palliative care cost-effective in multiple sclerosis? A randomized phase II trial. <i>J Pain Symptom Manage</i> 2009;38(6):816-26	U.K.	Fast-track Phase II RCT of severe MS patients (n=52) referred by clinicians; randomly allocated to either multi-professional palliative care team immediately (fast track. N=25) or control group who continued standard care for 3 months and then offered palliative care (n=21). Data collected at baseline, 6, 12, 18 and 26 weeks on use of services, symptoms, other outcomes and caregiver burden.	At 12 weeks, caregiver burden was 4.47 points lower (95% CI 1.05, 7.89) in fast track compared to control group. Mean service costs, including inpatient care and informal care, up to 12 weeks was £1,789 lower for fast-track group. Trend toward lower community costs in fast-track group and no difference in informal caregiver costs.	Compared to palliative group, control patients more likely to consult with general practitioner, to receive help from family/friends and to be admitted to or seen in hospital. Excluding inpatient care and informal care, mean service costs were £1,195 lower for PC group (bootstrapped 95% CI 2,915, 178). Analysis suggests PC was cost saving with equivalent outcomes for symptom control and improved outcomes for caregivers.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Higginson IJ. Evidence based palliative. There is some evidence – and there needs to be more. <i>BMJ</i> . 1999; 319(7208):462-3.	Editorial published in 1999.		Editorial on evidence to date on palliative care and its benefits and need for more study.	
Hill LT Jr. Cost-effectiveness of home/hospice palliative and support care. <i>J Natl Cancer Inst</i> . 1994;86(1):63-4.	Letter to the editor		Letter to the editor citing cost-effectiveness of care.	
Hoch JS. Improving efficiency and value in palliative care with net benefit regression: an introduction to a simple method for cost-effectiveness analysis with person-level data. <i>J Pain Symptom Manage</i> . 2009;38(1):54-61	Canada but not actual Canadian data and discussion section is American -focused	Cost-effectiveness analysis using net-benefit regression on a hypothetical data set with person-level data. Regression coefficient estimates difference in value between extra benefits of treatment and extra costs.	Discusses formulae to use and not actual outcomes. Makes the point that economic decisions are based in large part upon decision makers' willingness to pay (e.g., how much willing to pay for extra pain-free days). Resource limitations in health care means that decisions must be made as to how they are allocated and examining both extra costs and benefits of treatments compared to "usual care" can help estimate "value for money." Argues that palliative care researchers have the opportunity to lead economic analyses concerning efficiency and value in health care.	Goal of cost-effectiveness analysis (CEA) is to analyze relative efficiency of a treatment by focusing on a single outcome (gives example of pain-free days); trade-off between resources invested and outcomes gained. Typically, extra cost associated with extra gain (at per-unit level) needs to meet or exceed decision makers willingness to pay (WTP). In contrast, cost-benefit analysis looks at many outcomes and measures all of them in dollars. Cost-utility analysis measures outcomes in quality-adjusted life years (QALY) which represents number of life years remaining weighted by factor reflecting quality of life. Cost-minimization analysis looks only at costs and assumes patient outcomes are identical.
Hollander M, Chappell N. Synthesis Report. Final Report of the National Evaluation of the Cost-Effectiveness of Home Care, A Report Prepared for the Health Transition Fund, Health Canada, August 2002 2002; Victoria: National Evaluation of the Cost-Effectiveness of Home Care, Centre on Aging.	Canada	Report on all home care, not just palliative care	Key findings from substudies: home care costs 40-75% less than residential care, with stable clients costing the least. Transitions account for about 70% of the cost for facility clients. Home care for those who die is not cost-effectiveness as they require hospital services. The cost of home care services themselves may not be the major cost driver of home care but rather costs for other health services such as hospitals, doctors and drugs. Home support services appear to be substituting for acute care services.	

## GREY LITERATURE

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Hollander MJ. Costs of end-of-life care: findings from the province of Saskatchewan. <i>Health care Quarterly</i> 2009;12(3):50-58	Saskatchewan 2003/2004 fiscal year	Health care costs derived from administrative databases, including government costs and user fees; however, exclude out-of-pocket expenses paid by individuals or families and informal caregiving.	Average cost per person for government increases from \$1,373 for 12 months prior to death to \$7,030 for 30-days prior to death. When user fees are added, average per-person costs are \$1,641 and \$7,420. Costs are initially lower for those with no facility care (for government \$569 12 months prior, and \$613 in total) but during last 30 days increases to \$8,039 (government care)/\$8,087 (total costs). Those in residential/facility care for >80% of time have highest initial costs (\$3,582/\$4,543) but increase is much lower (for last 30 days \$3,579/\$4,570). Except for 30-day prior to death prior, average total costs for females were higher than those for males but this may be an artifact related to higher proportion of females in long-term care. For all time periods, highest cost was for people who started the time period in the hospital. For example, during last 30 days, those who started period in the hospital accrued average costs of \$18,181, compared to \$6,932 who started the period in the community with home care, \$5,746 who started in the community without home care, and \$5,412 who started the period in a facility. For all types of causes of death (Lunney/Fassbender groupings of sudden death, terminal illness, organ failure, frailty, and other) for 30 days prior to death primary cost was hospital care, followed by residential long-term care and physician services. Of 2,250 palliative care patients identified (out of close to 9,000 cases), average total cost per client was less, although the difference decreased in proportion to the length of the period prior to death. There was a relatively lower total cost for palliative clients across all time periods: for example, during 30 days prior to death \$5,082 vs. \$8,336; for 90 days \$8,103 vs. \$15,288; for 180 days \$10,847 vs. \$20,250; for 365 days \$14,996 vs. \$26,404. Difference were due primarily to lower hospital costs for palliative patients: for 30 days \$4,338 vs. \$7,062; for 90 days \$6,549 vs. \$12,410; for 180 days \$8,237 vs. \$15,821; and for 365 days \$10,421 vs. \$19,729,	Summary of study prepared for CIHI and Saskatchewan Health. Notes that this article focuses on aggregate end-of-life care costs regardless of type of care and does not analyze palliative care services. However, patient identified as part of Saskatchewan's palliative drug program and all clients with palliative care indicator for hospital stay characterized as palliative care clients. Study shows the influence of long-term residential care on costs of end-of-life care. If total costs were extrapolated to Canada, costs in 2003/04 dollars would be \$1.7 billion for 30 days prior to death and up to \$6.8 billion for the one-year period prior to death. Comparable figures for fiscal year 2009/2010 would be \$2.8 billion and \$11 billion.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Hongoro C, Dinat N.A cost analysis of a hospital-based palliative care outreach program: implications for expanding public sector palliative care in South Africa. <i>J Pain Symptom Manage.</i> 2011;41(6):1015-24..	South Africa	Estimate of costs and cost drivers for a hospital outreach palliative care services in a low-resource setting (South Africa). Use of administrative data and surveys of a cohort of 72 consecutive, consenting patients enrolled in a palliative care service over a two-month period. Large proportion of patients were diagnosed with HIV/AIDS.	481 patients registered for outreach visits and 4,493 visits were conducted. 1,902 patients registered for in-hospital visits and 3,412 visits held. Cost per hospital outreach visit was US\$71 and for in-hospital visits was US\$80. Cost per outreach visits 50\$ less than average cost for a patient day equivalent for district hospitals (\$142). Some of the palliative outcome scores of the cohort subsample (n=72) showed statistically significant improvements. Concludes that hospital outreach services may reduce hospital admissions for overburdened services in low-resource settings and improve quality of life of patients in their home environment. Family worry fell by 56%, symptom scores by 56% and pain scores by 51%; other quality of life indicators (e.g., ability to share, finding life worthwhile, family information) also improved.	Main driver of costs were personnel costs, particularly for in-hospital visits. Personnel costs account for 14% of total costs for outreach visits and 20% for in-hospital visits. Difference is explained by nurse vacancies for home visits during the early part of project and relatively high remuneration for doctors who conducted in-hospital visits. Costs would decline with increased use of nurses. Inclusion of utility costs unlikely to significantly change costs.
Hughes J. Palliative care and the QALY problem. <i>Health Care Anal.</i> 2005;13(4):289-301	N/A	Narrative on the issue of using QALY to evaluate palliative care; review of the literature.	Palliative care can be difficult to justify through cost-effectiveness studies when QALYs are used to evaluate benefits (QALY maximization), as procedure which prevent premature death or improve quality of life for those with longer life expectancy will produce larger QALY values. Argues that to justify resources for palliative care advocates must abandon "atomistic" view of value of life embedded in QALY in favour of a "holistic" or "narrative" definition. In narrative approach, value of a life residents in its narrative wholeness or integrity; a bad death (i.e., a death incongruent with what the individual priorities or values) can destroy the value of a life. By managing symptoms, palliative care can enable people to spend their last days "in a manner befitting the values which had shaped their life and can provide a benefit that goes beyond the differences that it makes to the patient's experiences during those last days, bringing the life as a whole to a more satisfactory conclusion and making it a better, more successful life than it would otherwise have been." [ p 299]	QALY has atomistic conception of value of life: value of life is the "sum of all the separate values of its component temporal parts." Holistic or narrative view: "what happens during salient periods in a life can affect our evaluation not only of that period but of the life as a whole." [p 298]
Hughes-Hallett T, Craft A, Davies C. Funding the Right Care and Support for Everyone. <i>Creating a Fair and Transparent Funding System; the Final Report of the Palliative Care Funding Review</i> , July 2011. 2011;London: Palliative Care Funding Review.	U.K.	Review commissioned by Secretary of State for Health on dedicated palliative care for adults and children in England.	Creating incentives for palliative care provision leads to better outcomes for patients, supports choice, and is the most cost-effective way of using NHS resources. That author found a lack of good data on costs of palliative care in England.	Discussion is specific to the NHS funding system in England.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Hugodot A. <i>Cost-effectiveness of palliative care in hospital: a review of the literature (Part 3), Hospice Friendly Hospitals Programme</i> . 2007; Dublin: Centre for Health Policy and Management.	Systematic literature review of hospital-based palliative care	65 articles retrieved; most American and cost analyses; few economic studies.	Costs of end-of-life patients often spread throughout different hospital units and can be difficult to track. Financial evaluations of palliative care have looked primarily on economic effect of hospice care in general and few with cost-effectiveness of hospital-based PC compared to conventional hospital care. PC associated with significantly lower diagnostic services, treatments, tests and interventionist procedures, accounting for about 70% of total cost savings. In one study, PC patients were 42% less likely to be admitted to ICU and in another there were 50% fewer therapeutic interventions. One study reported professional charges decrease when focus of care shifts from curative to palliative. In one study, hospital palliative units cost 57% less for a cancer patient than elsewhere in the hospital, due to fewer tests and treatments. A few studies have demonstrated that increased use of hospice and advanced directives and lower use of high technology interventions can produce significant cost savings; there is also some evidence that early DNR orders may decrease number of ICU admissions. Studies have put cost savings associated with inpatient PC programs at about 50%, in one study ranging from 40% to 70%. Savings more than equaled cost of running the service. Several small studies have found PC reduces number of ED visits and hospitalizations because of improved efficacy and comprehensiveness of care coordination. A 2004 study of outpatient PC found no significant differences in costs but improved patient outcomes; a 2005 study found less consumption of acute care. 2006 reports in last 20 days prior to death, cost per day was significantly less in inpatient palliative care unit than non-PCUs and ICUs; estimates cost savings of nearly \$1 million by third year of operation.	Most common metric for gauging cost containment is reduction in hospital length of stay (LOS). However, costs during last day of a hospital stay are a small proportion of total cost of care: reducing LOS by 1 day reduces total cost of care only 3% or less. Weakness of review is fact that studies tend to be small, observational and do not use appropriate comparison groups or multivariate modeling to adjust for confounding variables or reduce bias. Nevertheless, they suggest hospice care does not cost more and provides a means for patients to "exercise their autonomy over EOL decision." There are also indicators of better patient and family outcomes, suggesting both cost and quality advantages. Palliative care increases quality of care because it reduces pain and manages symptoms more efficiently; is associated with helping patients and families to make more informed decisions about difficult EOL issues such as advanced directives and DNR orders. Contributes to continuity and coordination of care.
GREY LITERATURE				
<i>Ideas and Opportunities for Bending the Health Care Cost Curve. Advice for the Government of Ontario, April 2010</i> . 2010; Toronto: Ontario Association of Community Care Access Centres, Ontario Hospital Association, Ontario Federation of Community Mental Health and Addiction Programs.	Canada	Policy paper that includes review of literature	Argues for home-based palliative care. States that one evaluation of a Hamilton-area program operated by HNHB CCAC enabled more palliative care clients to die at home and cost half of comparable care in hospital setting. Preliminary data from the Integrated Client Care Project suggest large cost-saving potential of implementing palliative care initiative. Cost of providing palliative care in the home approximately \$4,700/client (including other non-palliative services) compared to \$19,000/client in an acute care setting. Total cost differential \$15,200 per client. Every 10% shift of palliative care patients from an acute care setting to a home care setting would result in savings of \$9 million. 25% shift would result in \$23 million savings and 50% shift \$46 million.	Ontario-based calculations; emphasis solely on home-based palliative care.
GREY LITERATURE				

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Jennings B, Morrissey MB. Health care costs in end-of-life and palliative care: the quest for ethical reform. <i>J Soc Work End Life Palliat Care</i> . 2011;7(4):300-17	Review of ethical issues of health care cost control in EOL and palliative care	Narrative/editorial review; based on assumption that palliative care is cost-effective	It has been estimated that in U.S. EOL care spending accounts for 10%-12% of total health care spending and 25-30% of Medicare spending. It is ethically important to protect vulnerable dying patients from both inappropriate over-treatment and under-treatment. Cost containment is an ethical issue, as resources allocated to health have opportunity costs in that they cannot be spent on other social programs. So although there is an ethical imperative to control medical costs and use resources justly and effectively, it must be done in a patient/family-centered way. Hospice in U.S. as it is presently financed and organized is not designed for needs of patients who want/need both disease-modifying and palliative therapies. Growth in hospital-based palliative care is needed to improve access, especially for frail elderly who may be receiving acute services during last year of life. Decisions about resource allocation are made at different levels: 1) large-scale, system level (health care insurance and financing policies; civic debate); 2) hospital or institutional level governance and management; 3) facility policies (e.g., admission criteria, which can be sensitive and controversial); 4) dynamics of individual patient care planning and decision-making (immediate and tangible decisions involving patient, family, health care providers).	Much of the discussion is specific to U.S. setting and limitations imposed by Medicare Hospice Benefit Act of 1982. States there is growing body of evidence that hospice and palliative care services are cost effective when delivered in health care settings including hospitals and nursing homes. Argues that development of a national palliative care model is needed through legal reform, education and research to contain cost of EOL care. Recommendations include expansion of palliative care through hospitals and nursing homes.
Johnson AP, Abernathy T, Howell D, Brazil K, Scott S. Resource utilization and costs of palliative cancer care in an interdisciplinary health care model. <i>Palliat Med</i> 2009;23(5):448-459	Canada	Narrative/editorial review; based on assumption that palliative care is cost-effective Pilot study of resource utilization for an interdisciplinary palliative home care service in Ontario, Canada; subsequent publication Guerrier et al. (2010) with different data set.	Total costs for the 434 patients was CDN\$2.4 million and cost/patient CDN\$5,586 with average length of stay slightly more than 2 months (64 days). 25% (54/235) palliative care patients died at home vs. 15% (26/199) conventional care patients, $p < .05$ . Time spent at home was not significantly increased, although intervention patients spent less time in nursing home in last month of life (7.2% vs. 14.6%, $p < .01$ ). Hospital use was similar in the two groups.	



REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Jung HM, Kim J, Heo DS, Baek SK. Health economics of a palliative care unit for terminal cancer patients: a retrospective cohort study. <i>Support Care Cancer</i> 2012; 20(1):29-37	South Korea	Retrospective analysis of hospital bills and medical costs of 656 patients who died of cancer January-December 2007 at one university hospital in Seoul. 126 of the patients died in the palliative care unit; comparison of PCU vs. non-PCU patients. Costs converted to U.S. dollar at 2007 rate.	PCU patients more likely than non-PCU to have DNR orders ( $p<.001$ ), visit the emergency room ( $p=.045$ ), and receive palliative chemotherapy ( $p=.002$ ). Non-PCU patients more likely to be admitted to ICU ( $p<.001$ ), be put on a ventilator ( $p<.001$ ) and receive hemodialysis ( $p<.001$ ). Total medical cost per patient within 6 months of death average \$27,863 (\$24,799 in hospital charges and \$3,063 in ER charges). Total medical cost within 6 months of death significantly lower for PCU group than non-PCU (\$21,591 vs. \$29,577, difference = \$7,986, $p<.001$ ): difference due to higher hospital charges for non-PCU group in spite of lower outpatient and ER costs. Significant difference between PCU and non-PCU patients in medical costs starting at 2 months before death: costs for PCU patients 32.8% lower 1 month before death (\$8,987 vs. \$13,368, difference = \$4,381, $p<.001$ ) and 33.0% lower 2 months before death (\$4,046 vs. \$6,069, difference = \$2,023, $p<.001$ ). Patients using PCU services, those with solid cancers, and those with less than a high school education paid lower medical expenses ( $p<.05$ ). Concludes that study verifies cost savings of PCU.	Women ( $p<.001$ ) and younger patients ( $p=.002$ ) more likely to use PCU. Medical costs per month during the 6 months prior to death dramatically increased as patient reach the terminal stage: from <\$2,000 six months before death to ~\$9,000 for PCU patients in month before death vs. ~\$13,400 for non-PCU patients. Discussion of cultural barriers to palliative care in Korea.
Klinger CA, Howell D, Marshall D, Zakus D, Brazil K, Deber RB. Resource utilization and cost analyses of home-based palliative care service provision: The Niagara West End-of-Life Shared-Care Project. <i>Palliative Medicine</i> 2012; Jan 16 Epub ahead of print.	Canada	Cost description study of shared-care approach to providing enhanced EOL care of 95 study participants (average age 71) years, 83 with cancer and 12 with other diagnoses. Study conducted in rural setting.	Total cost for all patient-related services (in 2007 \$CDN) were \$1.6 million or \$17,112 per patient or \$117.95 per patient day. Expenditures were higher than those previously reported for cancer-only population in an urban Ontario setting but similar to long-term care per diem (\$124.55) and lower than alternative level of care and hospital costs.	States that, compared to other studies, a higher proportion of costs were for home-based care services (CCAC 49% + Enhanced Palliative Care Team 14% = 63%) and less for hospital costs (31%). Exact figures for this comparison not given. Three references are given for this comparison. 1) Dumont 2009: inpatient hospital stays accounted for 33% of mean total cost per patient, home care 19% and informal caregiving time 18%. Wister 2005: unable to find this sort of cost breakdown. Rand report, Lynn 2005: does not provide any cost information or breakdown by type.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Kunkler I. Cure, palliation, and cost in cancer care. <i>Lancet Oncoogy.</i> 2004;5(12):709.	Editorial		Editorial focusing on cancer treatment costs. No info on palliative care costs.	
Lawton S, Denholm M, Macaulay L, Grant E, Davie A. Timely symptom management at end of life using 'just in case' boxes. <i>Br. J Community Nurs</i> 2012;17(4):182-3 188 passim	U.K.	Evaluation of a pilot program; 89% response rate to survey to 65 primary care practices.	65 primary care bases were surveyed to gauge awareness and use of "just in case" anticipatory prescribing boxes. Most respondents had heard about and used the tool.	
Macklis RM, Cornelli H, Lasher J. Brief courses of palliative radiotherapy for metastatic bone pain – a pilot cost-minimization comparison with narcotic analgesics. <i>Am J Clin Oncology-Cancer Clinical Trials</i> 1998;21(6):617-622	U.S.	Data from pilot study comparing effectiveness and estimated costs for radiotherapy and narcotic analgesics in patients with cancer.	Estimated cost per patient ranged from \$1,200 to \$2,500 for radiotherapy, compared with \$9,000 to \$36,000 for 9 months of narcotics. Brief course of radiotherapy significantly reduced pain and appeared to be cost-effective compared with narcotics.	
McBride T, Morton A, Nichols A, van Stolk C. Comparing the costs of end-of-life care. <i>J Palliat Care</i> 2011;27(2):126-33.	U.K.	Markov model based on cost and utilization data for cancer and organ failure patients in last year of life; simulate reduced acute care utilization due to palliative care	Societal cost of 127,000 cancer patients dying in 2006 calculated to be £1.8 billion. Equivalent cost for 30,000 people dying from organ failure was £553 million. Reducing reliance on acute care could avoid costs of £16-171 million. In 2006, there were 1.2 emergency admissions, 17 days in hospital and 3.5 days in hospice for each U.K. cancer patient.	Cites Carers U.K. estimate that in 2007 replacing all informal care with professional services would cost £71 billion but this includes all care and not just palliative care. Cites National Audit Office calculation of cost of care for cancer patients over last year of life (per diem cost +10%) as: home/community care £25.22-30.82; hospital care 199.82-244.22; and hospice care 119.23-145.72.
McCaffrey N, Currow DC, Eckermann S. Measuring impacts of value to patients is crucial when evaluating palliative care. <i>J Pain Symptom Manage.</i> 2009;37(6):e7-9.	Letter to the editor.		Letter to the editor concerning article on eliciting individual preferences about end-of-life preferences. Notes that in U.S. and Canada, having "financial affairs in order" is rated as "important" or "very important" by 80%-90% of people with advanced chronic illness. Zimmermann et al.'s study of effectiveness of specialized palliative care teams included only one study using a quality of life measurement tool specific for a palliative care population and it did not explicitly include preparation for death.	

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
McCrone P. Capturing the costs of end-of-life care: comparison of multiple sclerosis, Parkinson's disease, and dementia. <i>J Pain Sympt Manage</i> 2009;38(1):62-67	U.K.	Estimation of costs from reviews of existing studies.	Six-month cost of MS varies by disease type: highest for primary progressive (PP), followed by secondary progressive (SP) and relapsing-remitting (RR). Costs (£) include: Formal service: 2095 for PP, 2,390 for SP and 2,322 for RR. Informal care: 7,456 for PP, 6,979 for SP, and 3,327 for RR. Total for both services: 9,482 for PP, 9,407 for SP and 5,561 for RR. Costs of Parkinson's disease also varied by disease stages. For formal services ranges from 1,967-6,224; for informal care 8,496-13772; for total of 10,453 – 19,256. Dementia difficult to cost.	Main point may be that cost of informal caregiving is often greater than that of formal services. Costs increase as severity of disease increases.
Meier DE, Beresford L. Billing for palliative care: an essential cost of doing business., <i>J Palliat Med</i> 2006;9(2): 250-257	U.S.	Description of billing procedures for Medicaid, Medicare and U.S. health insurance plans.	Billing income is essential for survival of palliative care programs. Third-part billing by physicians and advanced practice nurses for palliative care consultations can help to recoup majority of salary and overhead costs. Biggest barrier to palliative care billing is reluctance to aggressively seek reimbursement/inexperience in billing practices or under-valuation of contribution to health care.	Discussion of billing options in U.S. health care system.
Meier DE, Beresford L. Palliative care cost research can help other palliative care programs make their case. <i>J Palliat Med</i> . 2009;12(1):15-20.	U.S.	Editorial on Morrison (2008) article.	Cites results from Morrison showing that hospitals can save \$250 or more in direct costs per patient per day by providing palliative care to appropriate patients, with numbers consistent across settings and institutions. Family meetings and goals clarification typically (but not always) lead to more conservative treatment choices by patients/families, leading to more efficient use of hospital beds; effectiveness due to systems thinking and expert communication skills to help complex patients navigate complex health care system. To achieve cost saving, palliative care must not focus on a single factor such as pain management but on large process of communication and goals clarification and be delivered by an interdisciplinary team.	Quotes one expert as saying, "A dollar generated from new revenues and a dollar saved in avoided expenditures are both worth a dollar to the hospital." [p 16] By freeing up acute care beds, palliative makes beds available to other patients in need. To be effective, need to follow Palliative Care Leadership Centers guidelines of other palliative care practice guidelines to ensure interdisciplinary care and enhanced communication with patients and families.
Meier DE. Increased access to palliative care and hospice services: opportunities to improve value in health care. <i>Milbank Quarterly</i> 2011;89(3):343-80.	U.S.	Review of literature and data	Evidence that palliative care and hospice improve patient-centered outcomes such as pain, depression and other symptoms, patient and family satisfaction and proportion of patients receiving care where they choose. Some evidence that, compared with usual care, palliative care prolongs life and helps to avoid emergency department and hospital stays. By shifting locus of care to the home or community, palliative/hospice care can help reduce health care spending on sickest and most costly patient population.	Good review of the literature with emphasis upon American studies.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Miller GW, Williams JR Jr, English DJ, Keyserling J. <i>Delivering Quality Care and Cost-Effectiveness at the End of Life. Building on the 20-Year Success of the Medicare Hospice Benefit.</i> 2002; Alexandria, VA: National Hospice and Palliative Care Organization, February 2002	U.S. report	Economic data derived from Medicare spending	A third of all Medicare dollars are spent on patients who are dying. A 1995 study found that for each dollar Medicare spent on hospice home care it saved \$1,52 in Part A and \$1 in Part B expenditures, with per-patient savings in last month of life totaling \$3,192. Other studies suggest use of hospice and advance directives can save up to 10% in last year of life, 10-17% during last 6 months, and 25-40% in last month. Cost-effectiveness of hospice has made it attractive to managed care plans: as of 1994 82% offer hospice services and 44 states plus DC cover hospice care under Medicaid. 1998 study found 83% of employers offer explicit hospice benefits.	European model defines hospice as a place for the terminally ill but American model defines it as a process and emphasizes home-based care. Hospice care in U.S. reflect wishes of majority of Americans (as document in public opinion surveys) to die at home. Number of hospice providers in the U.S. has grown rapidly since 1980s and is now providing more intense and sophisticated palliative care services for a broader array of terminal diseases.
GREY LITERATURE				
Morgan L, Howe L, Whitcomb J, Smith K. <i>Improving communication and cost-effectiveness in the intensive care unit through palliative care: a review of literature. Dimensions of Critical Care Nursing</i> 2011;30(3):133-8	N/A (U.S.)	Narrative literature review	States approximately 20% of U.S. deaths occur in ICU. Cites National Priorities Partnership 2008 statement that palliative care can reduce hospital costs of palliative patients by 45%; also cites Morrison et al. study. Discussion about care in ICU, including EOL care discussions, as not only meeting ethics for medical care but helping to reduce EOL care costs.	"The literature shows that patients with a thorough and complete knowledge of medical interventions that are not likely to save them or improve their health conditions are likely to decline them. Therefore, patients with adequate and realistic knowledge about their health care are able to make better informed decisions about which interventions they will receive." [p. 136]
Morrison RS, Dietrich JD, Ladwig S, Quill T, Sacco J, Tangerman J, Meier DE. <i>Palliative care consultation teams cut hospital costs for Medicaid beneficiaries. Health Aff (Millwood)</i> 2011;30(3):454-63	8 U.S. hospitals	Administrative data from 8 hospitals with established palliative care programs 2002-2004. Of 2,966 palliative care patients who were discharged alive, 2,630 palliative patients (89%) were matched to 18,427 usual care patients; of 2,388 palliative care patients who died, 2,278 (95%) were matched to 2,124 usual care patients. Direct costs include	Palliative care patients discharged alive had an adjusted net savings of \$1,696 in direct costs per admission (p=.004) and \$279 in direct costs per day (p<.001); included significant reductions in laboratory and ICU costs compared to usual care patients (\$424 per admission<.001 for laboratory costs and \$5,178 per ICU admission, p<.001). Even when outlier patients were included (those with LOS <7 days and >30 days) resulted in reductions in direct costs/day of \$275 and \$246 in favour of palliative care. Palliative care patients who died had adjusted net savings of \$4,098 in direct costs per admission (p=.003) and \$374 in direct costs per day (p<.001); as well as reduction in laboratory and ICU costs (respectively, \$926 per admission, p<.001) and \$6,613 per ICU admission, p<.001) there were significant reductions in pharmacy costs compared to usual care (\$1,544 per admission, p=.04). Including outlier patients resulted in reductions in direct costs per day of \$559 (LOS < 7 days) and \$370 (>30 days) in favour of palliative care. No statistically significant differences in LOS between palliative and usual care patients for either those discharged alive (13.1 vs. 12.4 days,	In U.S. there has been a dramatic increase in number of hospitals reporting palliative care programs (96% increase between 2000 and 2005). Cites literature showing that hospital palliative care programs can improve physical and psychological symptom management, caregiver well-being and family satisfaction; current study was to increase information on effect on hospital costs. Patients were well matched and were enrolled from 8 diverse hospitals serving low-, medium-, and high-cost markets so generalizability of results should be good. Unlikely that cost savings were due to care plans made by patients and physicians prior to involvement of palliative care team, especially given confirmatory analysis that showed that costs decrease within 1-2 days of palliative consultation. SUPPORT

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REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
		medications, procedures or services, based on hospitals' cost accounting system (all hospitals used same system).	p=.12) or died in hospital (14.1 vs. 13.9 days, p=.40). Two confirmatory analyses were conducted that support findings. Estimates that a 400-bed hospital with an interdisciplinary palliative care team seeing 500 patients a year (300 live discharges and 200 hospital deaths) could saving \$1.3 million per year even after accounting for physician revenues (\$240,000) and subtracting personnel costs (\$418,000).	study suggests that patient preferences and physicians' knowledge of patients' preferences and prognoses do not have measurable effect on treatments and hospital costs in usual care settings. Results suggest that palliative care consultation is effective in fundamentally shifting the course of hospital care from its usual curative approach and establishing treatment goals that include discontinuing treatments or tests that do not meet these goals; in doing so, costs are significantly reduced. Data confirms and extends previously published small, single-site studies; provides strong fiscal incentive for the development or expansion of palliative care programs. Given growing proportion of older and medically complex chronic patients, cost savings could be substantive and help to sustain public health insurance (in U.S., Medicare).
Mula C, Raftery AM. Evidencing cost efficiencies in specialist palliative care. <i>Int J Palliat Nurs.</i> 2011;17(12): 575	U.K.	Editorial	Editorial on specialist palliative care. Claims – but no evidence – that cost efficiencies can be demonstrated in proactive complex pain and symptom control, appropriate discontinuation of active treatment, rationalization of non-essential medication in last weeks of life, facilitation of planned and rapid discharge for end-of-life care thus reducing hospital bed days, avoidance of inappropriate admissions through better community-based care and communication.	
Murray E. How advocates use health economic data and projections: the Irish experience. <i>J Pain Symptom Manage.</i> 2009;38(1):97-104.	Ireland	Description of advocacy for palliative health care funding in Ireland	In 2006, Irish Hospice Foundation joined with Irish Cancer Society and Irish Association for Palliative Care to advocate with government to address regional service inequities. Economic downturn in 2008 threatened implementation of five-year plan for comprehensive national palliative care services. New services can be developed only if there is strong evidence of cost-effectiveness. Description of how joint advocacy group has used economic evidence to advocate for services; campaign facilitated by good data and an agreed evidence-based policy on what constitutes comprehensive services. Progress could not be made until a detailed audit of services was conducted to document gaps and inequities between health regions. Hospice/palliative care was initially provided	Irish recommendations: 1) 10 inpatient hospice beds per 100,000 population with at least one inpatient hospice unit per regional health administrative area with one nurse, 0.5 care attendants per bed; also one PT, one OT and one social worker per 10 beds; 2 spiritual care chaplains per hospice and one pharmacist per hospice 2) at least one palliative medicine consultant per 160,000 population with at least two in each health board area; 3) >3 non-consultant doctors per

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REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
			by voluntary services but is now 80% state-funded. In many cases, voluntary agencies provide services and fundraise for innovation, education, research and additional services (night nursing, transport, appliances, assistance in personal hardship cases). Summary of economic studies from U.S., U.K., Spain, Ireland, Israel and Canada on cost benefits of palliative care. Reports saving through hospice care are greatest for: 1) cancer patients, 2) short-term hospice (i.e., <6 weeks), 3) home care, and 4) patients in large-scale hospice facilities. Hospitals that offer palliative care also report reduced costs through lower use of acute care beds, aggressive therapies and ICU stays.	palliative medicine consultant; 4) consultant-led multidisciplinary team in each acute hospital with >150 beds (to include nursing and social work as well as non-consultant doctors) 5) a minimum of one specialist palliative care nurse in the community per 25,000 population, 6) at least one PT, one OT and one social worker in the community per 125,000 population.
National Institutes of Health. <i>Fact Sheet: End-of-Life</i> . Bethesda: 2010.	U.S.	Fact sheet	Approximately 25% of all U.S. death occurs in long-term care setting and it is projected to rise to 40% by 2040. Up to 20% of all deaths in the U.S. occur in or shortly after an ICU stay.	
GREY LITERATURE				
National Priorities Partnership. <i>National Priorities and Goals: Aligning Our Efforts to Transform America's Health care</i> . Washington, DC: National Quality Forum; 2008.	U.S.	Report written by experts based on review of literature.	Sets series of targets for primarily hospital reform of services. Sets goal that all patients with life-limiting illness should receive high-quality palliative care and hospice services, including symptom relief and patient/family help with psychological, social and spiritual needs.	Goal is to reduce wasteful and inappropriate care by 50% in 9 targeted areas. To reduce "inappropriate nonpalliative services at end of life" makes recommendations concerning chemotherapy in last 14 days of life, inappropriate interventional procedures and more than one ED visit in last 30 days of life. Cannot find 45% figure cited by Morgan et al. as originating in this document.
GREY LITERATURE				
Neuberg GW The cost of end-of-life care: a new efficiency measure falls short of AHA/ACC standards. <i>Circ Cardiovasc Qual Outcomes</i> . 2009;2(2):127-33.	U.S.	Analysis/narrative review of measure of efficiency of end-of-life care in U.S. given in 2008 Dartmouth Atlas and posted on Consumer Reports website	Spending on EOL care would be straightforward indicator of provider performance is diseases presented and progressed in a uniform fashion but this does not occur in reality. As well, the ability to stabilize chronic, acute and critical illnesses can make it difficult to tell when EOL stage has been reached. Unnecessary hospital days can occur for many reasons: social care (medical problems would be manageable at home but there is no family or follow up support), "delay" days (post-discharge facility not available), "defensive care" (interventions to avoid lawsuits), and "desperation care" (care given to dying patients because families cannot accept that illness is irreversible). Barriers to compassionate EOL care include unrealistic expectations of cure, family psychodynamics, distrust of the system, cultural or religious factors, poor planning and communication.	One study of U.S. care found patients from highest spending regions received about 60% more care than those from lowest-spending regions but quality scores and outcomes were slightly worse. Suggests that more aggressive hospital care can worsen outcomes by increasing risk of procedural complications, hospital-acquired infections, and medical errors. Discusses AHA/ACC standards for reporting of resource allocations: measures should 1) integrate quality and costs, 2) be a valid cost measurement and analysis, 3) not be an incentive to providing poor-quality care, and 4) there is proper attribution of the measure. EOL care measures in Dartmouth Atlas so not meet these criteria.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
News from "the real world": cost-effectiveness in palliative care. [No authors listed] <i>Support Care Cancer</i> . 1994;2(4):211-2.	Short news item		Short summary.	
Nicosia N, Reardon E, Lorenz K, Lynn J, Buntin MB. The Medicare Hospice Payment system: a consideration of potential refinements. <i>Health Care Financing Review</i> 2009;30(4):47-59	U.S.	Examination of variation in resource utilization in Medicare's per diem payment system for hospice; visit-level resource utilization data linked to patient-level diagnosis and demographics for 68,000 Medicare patients in 2002-2003.	Analyses suggest case mix adjustment based on diagnosis and demographics does not improve understanding in variation in resource utilization across stays. Number of days of each type billed for a patient explains most of the variation in number of visits and labour costs at the patient level. However, there are substantive variations in resource utilization within stays that may not be captured in the existing per diem payment system – these may be related to variation in intensity of care during a stay. Patients receive a greater number of visits and incur greater visit labour costs at the beginning and end of stays; as a result, if all else is equal, longer-stay patients have lower average cost.	Article focuses exclusively on the appropriateness of per diem charge reimbursement system.
Normand C. Economics and evaluation of palliative care. <i>Palliat Med</i> . 1996;10(1):3-4.	Letter to the editor		Letter to the editor.	
O'Mahony S, McHenry J, Snow D, Cassin C, Schumacher D, Swelwyn PA. A review of barriers to utilization of the medicare hospice benefits in urban populations and strategies for enhanced access. <i>J Urban Health</i> 2008; 85(2):281-90	U.S.	Review	In many U.S. urban low-income communities, less than 5% of deceased patients received hospice care during last 6 months of life. Minorities more likely to die in hospitals and also have higher out-of-pocket expenditures than whites. Medicare beneficiaries residing in zip codes with lower-than-average income and higher rates of poverty have higher end-of-life expenditures and increased likelihood of dying in the hospital and lower rates of hospice utilization. Evidence that minority patients may be more likely to want aggressive, life-sustaining treatment. Distrust of health care system and lack of ethnic diversity among hospice providers may be barriers to hospice care. Time required to apply for Medicaid can be a practical barrier; some hospices may not accept patients without permanent addresses.	Also includes description of individual initiatives to increase access to hospice care.
O'Mahony S, Blank AE, Zallman L, Selqyn PA. The benefits of a hospital-based inpatient palliative care consultation service: preliminary outcome data. <i>Journal of Palliative Medicine</i> 2005;8(5):1033-9	U.S.	Review of medical records of 592 consecutive patients of 1 hospital-based inpatient palliative care consultation service seen between November 2000 and March 2002.	Main measures for the study consisted of uptake of palliative care team recommendations (90%), pain and other symptom improvement (87% of a sub-set of 368 patients), and family caregiver satisfaction as gathered by a telephone survey (n=55). For the 592 patients, prior to palliative care consultation, median number of ancillary tests was 4 compared to 0 post-consultation (p<.0001); median number of ventilator charges (for patients who had >1 charge) was 6 compared to 2 post-	In patients with managed care insurance, there appeared to be non-significant reductions in rates of emergency room visits (from 20.8% pre-consultation to 9.1% post-consultation, p=.43) and hospitalizations(42.9% pre-consultation to 35.1% post-consultation, p=.06).

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			consultation ( $p < .0001$ ). Median ventilator charges for patients with $>1$ charge was \$5,561 pre-consultation and \$2,080 post-consultation. A separate matched case control study of 160 patients who died and were on ventilators showed greater mean reduction in case rather than control patients of 695.05 ( $p = .054$ ) in diagnostic radiology and laboratory charges and \$2,005.56 for laboratory services ( $p = .008$ ).	
Ostgathe C, Walshe R, Wolf J, Hallek M, Voltz R. A cost calculation model for specialist palliative care for patients with non-small cell lung cancer in a tertiary centre. <i>Support Care Cancer</i> . 2008;16(5):501-6	Germany	Prospective tracking of real cost data from a tertiary university hospital of costs for patients with non-small cell lung cancer under 4 forms of palliative care services: 1) hospital support, 2) home care, 3) day care, and 4) in-patient care.	Aim of study was to determine fees reasonable for different stages of non-small cell lung cancer patients. Calculation of fees based on expert estimation of resource use, existing literature, and limited empirical data. Hospital support team services cost €483 and were used for 10% of patients in stage 1 and 90% of patients in stage 4. Home care involved 60 visits and cost €4,573; day-care involved 5 visits; home care and day-care budgeted for 5% of stage 1 and 30% of stage 4 patients. Costs range from €393 for stage 1 patients to €2,503 for stage 4 patients. In-patient care excluded from study as it is reimbursed separately.	Cost limited to one form of cancer; conducted in tertiary care setting.
Pace A, Di Lorenzo C, Capon A, Villani V, Benincasa D, Guariglia L, Salvati M, Brogna C, Mantini V, Mastromattei A, Pompili A. Quality of care and rehospitalization rate in the last stage of disease in brain tumor patients assisted at home: a cost effectiveness study. <i>J Palliat Med</i> . 2012;15(2):225-7.	Italy; specific type of patient (brain tumours) treated at one hospital	Analysis of administrative data on re-hospitalization rate in last 2 months of life in pilot project of palliative care for brain tumour patients. Of 572 patients enrolled in program, 394 died, of which 276 (70%) died at home.	Comparison of group assisted at home ( $n=72$ ) and without home assistance ( $n=71$ ). Number of hospital readmission in last 2 months of life lower in assisted group (16.7 vs. 38%, $p < .001$ ). Cost of hospitalization lower in home-assisted group (517 Euros, 95% CI 512, 522) than those without assistance (24,076 Euros, 95% CI 24,040, 24,112).	Data from a pilot project and it does not appear to include cost of program in analysis (focuses solely on hospitalizations and associated costs).
Palliative Care Australia. <i>Submission to the Treasurer on Priorities for the 2012 Federal Budget on behalf of Palliative Care Australia</i> . 2012; Deakin West, ACT. Palliative Care Australia.	Australia	Report to government	43% of those admitted to residential aged care facility as "high care" residents die within 6 months of admission and 51% within one year. Potential to reduce costs by integrating palliative care. There are a number of structural and resource barriers, including lack of time, training, remuneration, knowledge, resources and experiences, for primary care providers to offer palliative care but their involvement is critical in enabling terminally ill patients to die at home. Call for residential and community care provider to deliver palliative and EOL care, as it is "likely to be less expensive than equivalent services delivered in a hospital" but more satisfactory in a home-like environment.	Calls for Australian Government to allocate \$1.5 million over 3 years to enable palliative care pilot of national standards assessment program in elderly residential care facilities. Australia has 2010 National Palliative Care Strategy: Supporting Australians to Live Well at the End of Life, the Australian National Palliative Care Standards, and the PCA Health System Reform and Care at the
GREY LITERATURE				

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				End-of-life Guidance Document. Volunteers are a core part of strategy and proposal that government allocate \$713,000 over 3 years to support the development of a National Palliative Care Volunteering Strategy. Also proposals for allocation of funding for training in acute care hospitals (\$30 million over 3 years) and medical practitioners (\$6 million over 3 years), as well as \$30 million for development of a National Advance Care Directives Framework. Other proposals: \$4 million for development of national toll-free information and support service and \$120,000 to evaluate effectiveness of aids and equipment used in EOL and palliative care.
Patnaik A, Doyle C, Oza AM. Palliative therapy in advanced ovarian cancer: balancing patient expectations, quality of life and cost. <i>Anticancer Drugs</i> 1998;9(10):869-78	Canada	Results from a prospective and retrospective study evaluating chemotherapy costs.	In prospective study of second/third-line chemotherapy, mean total cost per patient for one line of chemotherapy was CDN\$12,500; half of patients appeared to drive some palliative benefit and quarter of patients had objective response in their disease. In retrospective study evaluating all costs from initiation of palliative chemotherapy until death, cost was CDN\$53,000 per patient. Patient expectation of palliative therapy in ovarian cancer was high and they were willing to put up with significant toxicity for modest benefit. Palliative therapy associated with high costs, but argues that even modest prolongation of survival means it is cost-effective. Major cost saving associated with palliative chemotherapy is from reduced need for hospitalization towards end of life.	
Payne SK, Coyne P, Smith TJ. The health economics of palliative care. <i>Oncology (Willston Park)</i> 2002;16(6):801-8	U.S.	Review	Compared with usual care, hospice care saves at best 3% of total care costs. Advanced directives early in the disease may save end-of-life care costs but when done in the hospital do not save money or influence care choices. Nurse coordination of palliative care maintained clinical outcomes and saved 40% of costs. Structured ethics review of those likely to die in ICU may better match care to outcome and save costs. Few RCTs of pain and symptom control interventions in EOL care; there are no examples of chemotherapy that save money compared to best supportive care. Modeling suggests coordinated, expert, high-volume care with early use of advance directives can prevent EOL hospitalization and reduce costs by 40% to 70%.	

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Paz-Ruiz S, Gomez-Batiste X, Espinosa J, Porta-Sales J, Esperalba J. The costs and savings of a regional public palliative care program: the Catalan experience at 18 years. <i>J Pain Symptom Manage</i> . 2009;38(1):87-96	Spain	Data from 18 years of a regional publicly-funded palliative care program.	In Catalonia, palliative care may have saved health care system €3 million in 1995, increasing to €8 million in 2005 (over 3-fold increase). During last month of life, only 16% of patients receiving palliative home care were admitted to hospital compared to 63% of non-palliative patients. Once in hospital, usual care patients stayed longer than palliative care (12.2 vs. 8.3 days). Non-palliative patients visited the emergency department 3 times more often than palliative home care patients. Palliative care programs in Spain relied largely on home care and most patients at home were fairly stable; in contrast, palliative care units and hospital beds usually care for more complex and unstable patients. In Catalonia expenditures were 52% for palliative care units, 30% for palliative home care teams, 17% for hospital support teams, and <1% for opioids. For health care system, savings were €2,250 per cancer patient; net savings for cancer patients estimated at €8 million per year in 2005.	Hospital-based palliative care has been shown to improve symptom control, facilitate shared decision-making on treatment and reduce hospital costs in both cancer and noncancer patients, as well as geriatric patients. Publicly-funded palliative program reduce care costs because they decrease number of hospital admissions, hospital stay length and frequency of emergency room visits.
Penrod JD, Deb P, Dellenbaugh C, Burgess JF Jr, Zhu CW, Christiansen CL, Luhrs CA, Cortez T, Livote E, Allen V, Morrison RS. Hospital-based palliative care consultation: effects on hospital cost. <i>J Palliat Med</i> . 2010; 13(8):973-9	U.S.	Observational study of 3,321 U.S. veterans hospitalized with ad-vanced disease Oct 1, 2004 – Sept 30, 2006 at 5 VA hospitals. Of total 606 (18%) re-ceived palliative care and 2,715 (82%) re-ceived usual hospital care. Tracked hospital costs and ICU use. Builds on earlier (2006) study, using a larger sample.	Average daily total direct hospital costs \$464 a day lower for palliative patients compared to usual care ( $p < .001$ ). Palliative care patients were 43.7 percentage points less likely to be admitted to ICU during hospitalization (95% CI 48.6%, 38.8%). In raw data, palliative patients averaged 2.2 hospitalizations over the study period vs. 2.0 for usual care ( $p = .004$ ); hospital and ICU length of stay significantly longer for palliative patients but a significantly smaller proportion included an ICU stay. When adjusted for disease, demographic and treatment factors, costs for hospitalization for palliative patients with advanced disease were significantly lower than usual care: hospital daily total direct costs \$464 lower (95% CI 515, 413), pharmacy costs \$51 lower (95% CI 60, 43), nursing costs \$182 lower (95% CI 201, 164), laboratory costs \$49 lower (95% CI 57, 43) and radiology costs \$11 lower (95% CI 19, 3). Covariates had an impact upon results with the exception of radiology costs.	Elderly veterans incur average of \$43,795 in Medicare and VA costs in the last year of life.
Penrod JD, Deb P, Luhrs C, Dellenbaugh C, Zhu CW, Hochman T, Maciejewski ML, Granieri E, Morrison RS. Cost and utilization outcomes of patients receiving hospital-based palliative care consultation. <i>J Pall Med</i> 2006; 9(4): 855-860	U.S.	Retrospective, observational study of costs at 2 urban VA medical centres, using payer (VA) perspective. Costs from 314 veterans admitted during 2 years.	Palliative care patients were 42 percentage points (95% CI -556% to -31%) less likely to be admitted to ICU. Total direct costs per day were \$239 (95% CI 388, 122) lower (\$901 [\$379] vs. \$1288 [\$645], $p < .001$ ). Ancillary costs were \$98 (95% CI 133, 57) lower than costs for usual care patients: \$121 (\$108) vs. \$223 (\$160), $p < .001$ . . No difference in pharmacy costs: \$83 (\$144) vs. \$85 {\$77}, 0.87. Results were similar when propensity score matching was conducted. Findings also indicate better patient and family outcomes with palliative care.	Palliative care during terminal hospitalization associated with significantly lower likelihood of going to ICU and lower inpatient costs. Cost results consistent with several studies from last 5 years. Suggests that palliative care programs lower costs by improving communication among patients, families and primary treating physicians about goals of care; such discussions lead to less use of tests, inappropriate technology and the ICU.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Pronovost P, Angus DC. Economics of end-of-life care in the intensive care unit. <i>Critical Care Med</i> 2001;29(2, Suppl S):N46-N51	U.S.	Literature review	Description of different types of economic analyses and how health care reform has impacted cost of dying. Difficult to calculate cost-effectiveness ratio for palliative care when there is good measurement for valuing the quality of death. May need to use alternative strategies such as cost-benefit analysis or distributive justice if economic analyses are to be used for decision-making.	Discussion of issues in conducting cost-effectiveness analyses and suggests cost-benefit analysis as alternative.
Rabow MW, Dibble SL, Pantilat SZ, McPHee SJ. The comprehensive care team, a controlled trial of outpatient palliative medicine consultation. <i>Arch Intern Med</i> 2004;164:83-91	U.S.	Controlled trial of 50 intervention and 40 control patients in a general medicine outpatient clinic over 1 year. In intervention group, primary care physicians received multiple palliative care team consultations and patients received advance care planning, psychosocial support and family caregiver training.	Clinical and health care utilization outcomes assessed at 6 and 12 months. Health care utilization tracked and charges calculated. During the study period, intervention patients made fewer visits to their primary care provider and fewer urgent care clinic visits but there were no statistically significant group differences in specialty clinic visits, emergency department visits, number of hospitalizations or number of days hospitalized. Mean charge per patient was \$47,211 (sd=\$73,009) for intervention patients and \$43,448 (sd=\$69,647) for control patients; difference was not statistically significant (p=.80). No significant group differences in urgent care, emergency department, or inpatient charges.	Consultations by a palliative medicine team improved patient outcomes such as dyspnea, anxiety and spiritual well-being but failed to improve pain or depression and did not reduce overall charges for health care.
Raftery JP, Addington-Hall JM, MacDonald LD, Anderson HR, Bland JM, Chamberlain J, Freeling P. A randomized controlled trial of the cost-effectiveness of a district co-ordinating service for terminally ill cancer patients. <i>Palliat Med</i> 1996;19(2):151-161	U.K.	RCT with patients randomized by their general practice in South London health authority; coordination group received assistance of two nurse coordinators (n=86) vs. usual care/control group (n=81).	Coordinated group had significantly fewer inpatient days (mean 24 vs. 40, p=.002) and home visits by nurses (mean 14.5 vs. 37.5 visits, p=.01). Mean cost per coordinated patient almost half that of control group patients (£4774 vs. 8,034, p=.006). Unit cost data relatively crude but were insensitive to wide range of unit costs and persisted when analysis restricted to patients who had died by the end of the study. Ratio of potential cost savings to cost of coordination service was between 4:1 and 8:1.	
<i>Review of hospital-based palliative care consultancy teams</i> , June 2007. Victorian Government Department of Human Services, Melbourne, Victoria; 2007.	Australia	Gov't report, including review of literature	States there is a gap in cost-effectiveness evaluations of hospital-based palliative care consultancy teams. There is evidence that multidisciplinary approaches to palliative care reduce overall cost by reducing time in acute care settings. Hospital-based consultancy provides additional fiscal and psychosocial benefits that are difficult to measure.	
GREY LITERATURE				

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Roberts D, Hurst K. Evaluating palliative care ward staffing using bed occupancy, patient dependency, staff activity, service quality and cost data. <i>Palliative Medicine</i> . 2012; Jun 11, 2012 Epub ahead of print.	U.K.	Prospective data collection in 23 palliative care and hospice wards across England: 7 palliative care wards and 16 hospice wards.	Approximately 3,500 NHS palliative care ward patients and 4,800 hospice patients were assessed. Hospice average-occupancy was lower than palliative care average but hospice workload was consistently higher than NHA palliative care ward workload. The authors conclude that hospice wards are better staffed and more expensive to run (as suggested by 45% better staffing as indicated by FTEs) but despite heavier workloads staff deliver higher-quality care than palliative units.	Although the authors distinguish between palliative and hospice wards, what constitutes "palliative" or "hospice" care is not defined. Study focuses on staffing issues and there is no discussion of associated costs.
Romo R, Gifford L. A cost-benefit analysis of music therapy in a home hospice. <i>Nurs Econ</i> . 2007;25(6):353-8	U.S.	Small retrospective study in one for-profit home hospice in San Francisco. Compared 8 patients receiving music therapy to 8 matches who did not (standard care).	"Providing quality patient care under tight fiscal restraints is challenging. Expenses related to medication costs have increased faster than Medicare's routine care per diem rate" [p. 353] Discusses some of the cost control initiatives tried in hospice such as co-payment for drugs, using contract pharmacies and formularies, not offering palliative chemotherapy or radiation, treatment with antibiotics or increasing case-load. Total cost of music therapy patients was \$10,658 vs. \$13,643 for standard care patients, resulting in cost savings of \$2,984.	Focuses upon a specific type of therapy: music therapy. Cost benefit analysis comparing benefits and comparing to cost of intervention; savings are divided by cost of the intervention resulting in cost-benefit ratio. If ratio is greater than 1.0, intervention is deemed cost beneficial.
Serra-Prat M, Gallo P, Picaza JM. Home palliative care as a cost-saving alternative: evidence from Catalonia. <i>Palliat Med</i> 2001;15:271-8	Spain	Study of consumption of health care resources during last month of life for patients with terminal cancer receiving standard care vs. standard care and additional of home support from palliative care team. Health or quality of life outcomes not formally measured. Only direct health care costs at time of study (1998) measured: hospitalizations, LOS, ED visits, outpatient visits, number of days in nursing home palliative care unit. Cost of drugs and primary care visits not included.	Compared to patients receiving palliative home care team visits, those in standard care group had more hospital admissions and longer length of stay, more emergency department and outpatient visits, and greater use of palliative care units within nursing homes. Patients in standard care had 71% higher cost per patient than those receiving palliative home care. As a result, authors conclude that home care teams for terminal cancer patients save the health care system money.	Home care team in Catalonia consists of a physician, three nurses and a social service professional. 37% of standard care patients were not admitted to hospital during last month of life vs. 84% of home care patients; for those hospitalizations, average LOS of 12.15 days for standard patients vs. 8.28 days for home care. Standard care patients had 3 times greater probability of visiting emergency departments; 13% utilized palliative care unit within nursing home (avg LOS 18 days) vs. 6.8% in home care group (avg stay 14 days). Differences in costs largely result of differences in percentage of patients admitted into hospital. No significant differences between groups in age distribution, gender, and type or location of tumours.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Shenfine J, McNamee P, Steen N A pragmatic randomised controlled trial of the cost-effectiveness of palliative therapies for patients with inoperable oesophageal cancer. <i>Health Tech Assess</i> 2005;9(5):iii, 1-121	U.K.	Multicentre RCT involved 7 NHS hospitals with health economic analysis; 217 patients with inoperable esophageal cancer randomized to one of four treatment groups: self-expanding metal stents (SEMS) of 18 or 24-mm; rigid intubation; and bipolar electrocoagulation and ethanol-induced tumour necrosis.	No difference in cost or effectiveness between SEMS and non-SEMS therapies. Concludes that a multidisciplinary team approach to palliation may be appropriate; choice is between non-stent and 18-mm SEMS and non-stent therapies should be made more available and accessible to reduce delay.	Not very helpful, as focused upon type of treatment for a specific cancer.
Sherman DW, Cheon J. Palliative care: a paradigm of care responsive to the demands for health care reform in America. <i>Nurs Econ.</i> 2012;30(3):153-62, 166.	U.S.	Narrative review/ editorial on palliative care	Palliative care addresses critical economic issues that health care reform is trying to address, as well as enhances quality of life of patients. Advanced practice nurses and nursing community in general are positioned to lead the way in reform of American health care system. States that difference between palliative and hospice care is timing: "palliative care is offered from the time of diagnosis with life-threatening illness through the death of the patient and into the bereavement period for families, while hospice care is offered at the end of life" [p 154].	"Palliative care is a paradigm of care, which expands the traditional disease-model of treatment to anticipate, prevent, and alleviate the suffering associated with serious, progressive, chronic, life-threatening illness at any point during the illness trajectory" [p 153-4].
Shnoor Y, Szlaifer M, Aoberman AS, Bentur N. The cost of home hospice care for terminal patients in Israel. <i>Am J Hosp Palliat Care</i> 2007;24:284-290	Israel	Cost of care for terminal metastatic cancer patients (n=146) by home hospices (n=73) and by conventional health services residing with family (n=73). Compared costs during patients' last 2 months of life, derived retrospectively after death. Data on health care services obtained from health plan.	Average overall per-patient cost of care was \$4,761 (operating costs included) for home hospice and \$12,434 for conventional health care services. On average, costs were lower for older patients. In multiple regression treatment units per patient, care framework and patient age contributed significantly to cost variance. Findings suggest that home hospice care for terminal patients is economically superior; however, cost of informal caregivers and patient and caregiver satisfaction with care were not included in this study. Findings said to be similar to those of other studies. "Acute hospital days account for more than half of all expenditures during the last year of life, and hospitalization contributes most to the cost of caring for terminal patients." [p.288]	Difference between study and control group in cost for some medical services due to extent of use rather than cost of item (e.g., inpatient care difference due to more frequent admissions in control group, resulting in costs of \$2,953 for study and \$10,367 for control group). Costs of laboratory testing \$165 for study and \$321 for control group: study group accounted for only 8% of tests but average cost of tests performed was \$25 for study patients and \$15 for control patients. Equipment costs for study group lower because study group had less expensive equipment (\$42 vs. \$70) even though they had higher rate of using equipment. Unlike previous American research, there was no difference between study groups in number of emergency department visits, which may be the result of different referral patterns; in addition, in Israel there is a policy to fill acute care beds quickly for system reimbursement.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Shugarman LR, Decker SL, Bercovitz A. Demographics and social characteristics and spending at the end of life. <i>J Pain Sympt Manage</i> 2009;38(1):15-26	U.S.	Analysis of Medicare spending	Age at death is associated with large spending differences at end of life, with spending declining at older ages. This finding is consistent with those in other countries.	Analyses suggest medical care during last year of life consumes 10% of U.S. health care budget and about 27-30% of costs for those aged 65+. Share of U.S. health care spending on patients in last year of life has been stable over time despite changes in health care technology and disease patterns. Average spending in last year of life approximately \$28,000 across all causes of mortality, being slightly lower for cardiovascular diseases (\$24-25,000) and highest for cancer (\$33,000) and COPD (\$35,200).
Simoens S, Kutten B, Keirse E, Berghe PV, Beguin C, Desmedt M, Deveugele M, Léonard C, Paulus D, Menten J Costs of terminal patients who receive palliative care or usual care in different hospital wards. <i>J Palliat Med</i> . 2010; 13(11):1365-9	Belgium	Multicentre (6 Belgium hospitals) retrospective cohort study comparing costs of care in a hospital palliative care unit to usual care in acute hospital wards. Costs for 30 days preceding death included fixed hospital costs and charges relating to medical fees, pharmacy and other charges; data pulled from hospital accountancy records and invoices from January 2008-May 2009. Total of 146 patients: 94 usual care and 52 PCU; met sample size calculation.	Palliative care in PCU more expensive than palliative care in acute ward due to higher staffing levels: mean costs 423€ for PCU patients vs. 340€ for patients receiving usual care ( $p=.002$ ). Higher costs of palliative care due to higher fixed costs (average of 318€ vs. 155€, $p<.001$ ) related to higher staffing levels. No difference in patient charges (each, 14€ average); however, health insurance charges less for palliative patients (average 91€ vs. 171€). Mean cost per day per patient with palliative care in a cardiology, geriatric or oncology ward was 283€ vs. 522€ for patient in a PCU ( $p<.001$ ), due largely to higher fixed costs of PCU (average 435€ vs. 153€, $p<.001$ ). However for patients in acute wards, mean cost per day was lower for patients receiving palliative care in cardiology, geriatric or oncology ward (average 283€) compared to patient receiving usual care (average 340€, $p=0.025$ ); no difference in fixed costs for non-palliative wards (155 vs. 153, $p=.941$ ). Concludes that PCUs are more expensive than palliative care in an acute ward because of higher staffing levels but palliative care in an acute ward is cheaper than usual care in same type of ward. Care models of palliative care are more likely to reflect needs of terminal patients.	"Hospital care for terminal patients aims to improve or to maintain the quality of life of patients with life-limiting conditions by emphasizing relief of pain and symptoms; by taking into account their psychological, social, and spiritual needs; by involving their family and friends; and by adopting a holistic, noncurative focus. However, health care systems have a limited ability to meet the needs of terminal patients and to keep a balance between costs and quality of care at the end of life." [p 1365] French study suggests salaries account for 62% of cost of palliative care (Tibi-Levy et al. 2006). Study suggests that palliative care models in acute wards may be less expensive than usual care and better reflect needs of terminal patients.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Simoens S, Kutten B, Keirse E, Berghe PV, Beguin C, Desmedt M, Deveugele M, Léonard C, Paulus D, Menten J. The costs of treating terminal patients. <i>J Pain Symptom Manage</i> .2010;40(3): 436-48.	N/A	Review of international literature 2-000-2009 of costs of palliative care vs. alternatives (n=15). Studies looked at palliative care in hospitals, different types of hospital units or at home; none looked at costs of palliative care in nursing homes.	Hospitalization costs make up the bulk of palliative care costs (e.g., in one study, 35%-77% of costs). In hospital settings, palliative care tends to be less expensive than usual care or care delivered in non-palliative care units. Palliative care costs vary according to diagnosis, status of disease and age. Different care models appear to target different groups of patients and offer different packages of services. Some evidence that palliative care at home (vs. alternative care models) is less expensive but this requires validation by more research. Hospitals need to admit patients to the palliative care units at the right time.	Good summary of each of the 15 individual studies. Notes that body of evidence on costs is small and varied. Few studies calculated palliative care costs across health care settings; most studies showed hospitalization represents principal cost component. Palliative care in hospital cheaper than usual care or care delivered in non-palliative wards. Costs in studies vary according to how "terminal" is defined: patient readiness, severity of illness, or prognosis. Some studies identify terminal patients as when curative or life-prolonging treatments cease.
Smith TJ, Cassel JB. Cost and non-clinical outcomes of palliative care. <i>J Pain Symptom Manage</i> . 2009; 38(1):32-44.	U.S.	Review	Recent RCTs among outpatients have shown that palliative care can maintain or improve quality of care while contributing to substantial cost savings. Presents data showing that palliative care can reduce ICU direct costs from \$6,974 (usual care) to \$1,726 (p<.001) for live discharges and from \$15,531 to \$7,755 (p=0.045) for hospital deaths; percent died in ICU declines from 18% to 4%. Data mixed on impact of palliative care consultation on inpatient length of stay, as it is influenced by local patterns of care, consultation, and assumption of the control of the course of care.	Authors stated that they recently reported in Wall Street Journal that palliative care consultations could reduce costs by more than 60% for patients who died in hospital. Points out that by the time complex patients are transferred from ICU to palliative unit, funds from DRG payment have typically been used up: need to emphasize cost avoidance approach to show that palliative care can save money even if the unit is not "profitable" itself (e.g., difference between ICU and palliative care unit cost per day/per bed). Furthermore, there are also avoided costs of procedures and tests; as well as revenue from paying patients who could "backfill" beds opened by transfer to palliative unit (opportunity cost of ICU bed filled with someone who is not getting better). Suggests metrics that hospitals can use to measure palliative care reduction in LOS and set benchmarks.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Smith TJ, Coyne P, Cassel B, Penberthy L, Hopson A, Hager MA. A high-volume specialist palliative care unit and team and reduce in-hospital end-of-life care costs. <i>J Palliat Med</i> 2003;6(5):699-705	U.S.	Daily charges and costs of the days prior to transfer to a dedicated 11bed palliative care unit (PCU) staffed by a high-volume specialist team to stay in the PCU for patients who died in the first 6 months after the PCU opened in 2000. Case-control study by matching 38 PCU patients by diagnosis and age to contemporary patients who died outside the PCU cared for by other medical or surgical teams.	During the 6-month study period, the unit admitted 237 patients; 52% had cancer, followed by vascular events, immunodeficiency or organ failure. There were both non-PCU and PCU data for 123 patients: PCU reduced daily charges and costs by 66% overall and 74% in "other" (medications, diagnostics, etc., $p < .001$ ). Comparing the 38 contemporary control patients who died outside the PCU to similar patients who died in the PCU, daily charges were 59% lower (\$5,304 + 5,850 to \$2,172 + 2,250, $p = .005$ ), direct costs 56% lower (\$1,441 + 1,438 to \$632 + 690, $p = .004$ ), and total costs 57% lower (\$2,538 + 2,918 to \$1,095 + 1,153, $p = .009$ ). Concludes that high-volume, specialized PCU significantly reduces costs.	Quality of care was not directly measured. Patient and family satisfaction was not formally measured but appeared high. All PCU patients had pain scores measured compared to two-thirds of non-PCU patients and all PCU patients had chaplain visits offered compared to one-third of non-PCU patients. PCU provided opportunities to reduce care that was not needed, such as oxygen in absence of dyspnea (minimum charge \$125/day), etc. Not a RCT but reviewed charts and found no demographic, diseases status, predictability of death or type of intervention differences between PCU and non-PCU patients.
Smith TJ, Hillner BE. Bending the cost curve in cancer care. <i>NEJM</i> 2011; 364(21):2060-2065	U.S.	Editorial	Discussion of reform in prevention and treatment of cancer needed to control health care costs. Costs are also increased "as a result of what we fail to do: engage in discussions about the possibility of death, end-of-life choices, and ways patients make the transition to the prospect of dying." [p 2062] EOL care discussions are evidence-based for reducing patient depression or anxiety, reducing the aggressiveness of EOL care, and reducing proportion who die in ICU or on a ventilator. Gives surviving caregiver better quality of life and saves society millions of dollars.	Many cancer patients have unrealistically optimistic expectations about their prognosis and how they will respond to therapy. Resetting expectations will be difficult and need to share anticipated response rates, chances of cure and transitional care to hospice in order to allow patients and families to make informed decisions while maintaining hope.
Smith TJ, Hillner BE. Concrete options and ideas for increasing value in oncology care: the view from one trends. <i>Oncologist</i> 2010;15 Suppl 1:65-72	U.S.	Review	Current incentives in oncology reward doing the most aggressive and expensive treatment, as long as patients are satisfied; as a result, U.S. cancer treatment costs are twice those of any other nation with no or little difference in survival, late referrals (if at all) to hospice and 14%-20% of patients receiving chemotherapy within 14 days of their death (when it is likely to harm and cause complications). Pattern of care increases risk for stress and burnout of oncologists, as well as detrimental to economic sustainability of care. Systematic changes are needed to realignment incentives to provide episode-based care that does not stress expensive chemotherapy of supportive care drugs without good evidence.	Cites evidence that when end of life discussions are held, adjusted odds ratio shows no difference in mental health or worry, 0.52 odds of wanting heroic measure, 0.04 of undergoing mechanical ventilation, 2.77 increased odds of admitting to being terminally ill, 3.46 of completing DNR form, reduced odds of agreeing to potentially going to ICU (0.27), 1.99 increased odds of using hospice, better family, spiritual and life review opportunities, and \$1,041 lower health care expenditures in last week of life (37% lower), which in U.S. could save \$76 million.



REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Stephens S. Hospital-based palliative care: cost effective-care for patients with advanced disease. <i>J Nurs Adm.</i> 2008; 38(3):143-5	U.S.	Description of estimated cost savings from establishing a palliative care program at 1 U.S. hospital	Cost savings achieved through 1) shorter LOS (average decrease of 2.9 days) and 2) better coordination of care and decreased use of ICU. Allowing patients to return home under care of hospice increased satisfaction and reduced readmissions. Estimated that the hospital save \$60,000-\$276,000 in 1st quarter of 2007 through better coordination of care and elimination of unnecessary tests, as well as avoided \$167,040-\$417,600 in hospitalization costs by reducing LOS by 2.9 days. As a result, total potential savings for that quarter was \$227,040-\$693,600; at this rate, potential savings for first year of operation would be at least \$1 million.	Not a formal economic evaluation; broad range of potential cost savings
Study: palliative care cuts hospitalization costs. [No authors] <i>Health care Benchmarks Qual Improv</i> 2001 May;18(5):52-3	Editorial/news summary		Summary of publication. Not available online.	
Sturza J. A review and meta-analysis of utility values for lung cancer. <i>Med Decision Making</i> 2010;30(6):685-93	N/A	Systematic literature review and meta-analysis of English-language studies on lung cancer; n=23 articles.	Different ways of estimating lung cancer cost utility value makes it difficult to compare studies. Utility values also varied by lung cancer stage, which is important for cost-effectiveness analyses.	Specific to one form of cancer and does not give cost estimates or discuss palliative care.
Taylor DH Jr. The effect of hospice on Medicare and informal care costs: the U.S. experience. <i>J Pain Symptom Manage.</i> 2009;38(1):110-4	U.S.	Sample of data from last full year of life for Medicare beneficiaries age 65+ who died between 1998 and 2001. Focused on out of pocket (co-pays and deductibles) costs during last 30-90 days.	Concludes that hospice is a rare example of a medical/ multiprofessional intervention that improves patient quality of life while reducing costs to third-party insurers. Out-of-pocket costs for families were not reduced and families experience higher informal costs when hospice is used. Benefits to offset these higher informal costs are hard to quantify. Medicare is supposed to provide "necessary and reasonable" care and hospice would easily qualify. Cost to Medicare during last year of life for hospice users (n=1,918) vs. matches (n=3,638): pre-hospice cost: \$25,409 vs. \$23,210 (diff=2,194 so higher for hospice users, p=.005); post-hospice cost: \$7,318 vs. \$9,627 (difference -2,300, p<.0001); total cost \$32,727 vs. \$32,837 (difference -110, p=.09). Family members of persons using normal care (n=1,829) had \$255 in informal costs during last 30 days of life, compared with \$540 for those using hospice continuously until death (n=468) and \$857 for those (n=70) who moved in and out of hospice (p=.01). For 60 days and 90 days, costs were also higher for consecutive and nonconsecutive hospice than for no hospice.	A quarter of the Medicare budget is spent on care during last year of life but we do not know when the last year starts. In the U.S., many of the characteristics of people who choose hospice (white race, higher levels of income and education) are also associated with greater health care use, so there is selection bias in who chooses hospice. Previous research by the authors found that even after controlling for selection bias, hospice saves Medicare on average \$2,300 per decedent; for those with hospice of 7 weeks, costs avoided about \$7,000 for cancer patients and \$3,500 for others. Current study to determine if savings are due to shifting burden to patients and families (e.g., informal caregiving). "Even if we got it wrong and the costs of hospice users are no different from normal care, but with better quality, it is an easy call to continue hospice." [p. 113]

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Teerawattananon Y, Mugford M, Tangcharoensathien V. Economic evaluation of palliative management versus peritoneal dialysis and hemodialysis for end-stage renal disease: evidence for coverage decision in Thailand. <i>Value in Health</i> 2007;10(1):61-72	Thailand	Markov model used to study incremental cost-effectiveness ratio (ICER) of palliative vs peritoneal dialysis or hemodialysis for end-stage renal disease in patients aged 20-70.	Using societal perspective, compared to palliative care, average ICER of initial treatment with peritoneal dialysis was 672,000 and of initial treatment with hemodialysis 806,000 Baht per quality-adjusted life year gained (in equivalent U.S. dollars \$52,000 and \$63,000). Treating younger patients resulted in significant improvement of survival and gain of QALYs compared with older patients. Cost-effectiveness and cost-utility ratios of both options for the older age group were relatively similar. Concludes that offering peritoneal dialysis as initial treatment is better than hemodialysis, but it is only considered cost-effective if the social willingness-to-pay-threshold is >700,000 Baht (\$54,000 U.S.) per QALY for younger patients (age 20) and 750,000 (US\$58,000) per QALY for age 70 years.	Estimates are specific to treatments for renal disease.
<i>The Quality of Death, Ranking end-of-life care across the world. A report from the Economist Intelligence Unit Commissioned by LIEN Foundation.</i> London: Economist Intelligence Unit 2010.	International	Summary and analysis of reports and data	In many countries, governments are not the main source of funding; there is a range of funding models from church and philanthropic support, to out-of-pocket payment by patients or families, or hybrid models relying on a mix of funding sources. Advocates use evidence that palliative care can be less expensive than traditional care by reducing hospital stays and emergency admissions and increasing community-based/home-based care. However, as the proportion of the elderly grows and people survive longer with chronic conditions, the cost of EOL care as a percent of overall health care spending is likely to "rise sharply" [p 25].	
GREY LITERATURE				
Tibi-Levy Y, Lee VM, de Pouvourville G. Determinants of resource utilization in four palliative care units. <i>Palliat Med</i> 2006;20:95-106	France	Prospective study in 4 French palliative care units, using case-report form to collect socio-demographic and medical data as well as daily cost for provision of care. Database consisted of 140 hospitalizations.	Daily cost per patient averaged €434 (sd=73) and ranged from €301 to €667. Six variables were predictive of higher costs: degree of anxiety of patients and/or families; proximity of death; extreme dependence; ENT cancer; relatively younger patient age; and provision of certain procedures such as IV, syringe driver, aspiration and oxygen therapy. Authors conclude that this study suggests a single rate should not be used to finance palliative care; reimbursement should be modified according to the characteristics of the patient. Compared palliative care in acute care and rehabilitation/extended care hospitals.	Excluding current article, published research on palliative care falls into 6 categories: 1) estimating cost, 2) relating costs to effectiveness of different treatments, 3) comparing palliative care to conventional care, 4) comparing home and hospital palliative care, 5) showing impact of coordinated health care networks involving hospitals and local authorities, and 6) measuring potential economic benefits for the community. Total cost per day for acute care was €482.07 +54.52 and for rehab/extended care was €387.8 +57.61. Individualized costs (medications, tests, time spent with patient and family) was 140.04 +36.60 for acute care hospitals and 81.14 +33.75 for rehab/extended care hospitals.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Transitional Care Model (website). New Courtland Center for Transition and Health, University of Pennsylvania School of Nursing, 2008-2009. <a href="http://www.transitionalcare.info/index.html">http://www.transitionalcare.info/index.html</a> Accessed 21/09/2012.	U.S.	Website	MEDPAC study reported that 18% of Medicare beneficiaries admitted to hospital are readmitted within 30 days, with an even higher rate among those with multiple chronic conditions. Calculated that this "churning" of patients costs \$15 billion in spending. Study with elderly heart-failure patients received specialized nursing care during hospital stay and at home following discharge had fewer hospital readmission and reduced Medicare spending by nearly 38%.	
GREY LITERATURE				
Tzala S, Lord J, Ziras N, Repousis P, Potamianou A, Tzala E. Cost of home palliative care compared with conventional hospital care for patients with haematological cancers in Greece. <i>Eur J Health Economics</i> 2005;6(2):102-106	Greece	Retrospective cost-mini-mization analysis using hospital perspective; all costs within January to end of June 2002. Comparison of patients receiving home palliative care and those receiving hospital care for treatment of haematological cancer requiring regular blood transfusions.	Estimated incremental cost of home palliative care compared to conventional care was €522 (95% CI 516, 528). Estimate not substantially affected in sensitivity analysis by varying unit costs within reasonable limits and was statistically significant under all scenarios tested. Home palliative care is more expensive than conventional hospital care. Difference due to 1) greater number of blood tests in the home care patients (home patients received regularly weekly or bi-weekly tests while hospital patients were tested only at admission); 2) home care costs increased by overhead costs, which were constant regardless of whether patient required transfusion, and 3) little difference in costs of providing transfusions in one-day clinic for home care patients compared with those for the hospital care patients. Total Ministry of Health-funded cost estimated CDN\$544 million per year, with average per patient cost of about \$25,000. Acute care consumes 75% of costs; only a small proportion of health care services used by end-of-life/palliative cancer patients consists of formal palliative care. Cost varied by type of cancer; average per decedent \$20,805 of which 72% was for acute care excluding ICU. Average OHIP expenditure \$1,232, varying by cancer type. Average prescriptions ranged from \$1,126-\$2,654.	Suggests that better coordination between home palliative care team and attending physicians could reduce frequency and types of tests, depending upon patient's condition. Now known when home care patients required or benefited from weekly or bi-weekly nurses' visits. Study did not look at patient or family satisfaction or out-of-pocket expenses. Average MOH-financed cost for EOL/PAL was \$176/day. Total costs varied by location of death: <ul style="list-style-type: none"> <li>• \$36,119 – chronic care facility</li> <li>• \$25,267 – acute care</li> <li>• \$15,866 – home</li> <li>• \$13,586 – emergency department.</li> </ul>
Ward S, Salzano S, Sampson F, Cowan J. <i>Guidance on Cancer Services, Improving Supportive and Palliative Care for Adults with Cancer. Economic Review.</i> 2004; London: National Institute for Clinical Excellence.	U.K.	Costing of all palliative services and supports.	Expenditures on specialist palliative care services in England in 2001/02 estimated to be £320 million and may be around £19 in Wales. In 2002/03, an additional £50 million/annum for 3 years, resulting in total national figure of £398.5 million for 2002/03. A typical cancer network serving 1.5 million is estimated to cost £11.5 million. Of total general and supportive palliative services, 3.7% is for care coordination, 2.9% user involvement, 6.1% face-to-face communication, 16.0% information, 21.4% psychological support services, 6.3% social support, 8.5% general palliative care, 29.3% rehabilitation and 5.7% for family and carers lead at cancer centres and units.	Report is aimed at developing cost of palliative care and does not evaluate economic or clinical benefits or outcomes. Supportive and general care, excluding out-of-hours community nursing, totals £59.3 million for England and Wales. For specialist palliative care services, total cost is £41.8 million, with 16.3% for medical staff, 44.5% for nursing staff, and 14.8% for extended specialist palliative care team (e.g., OT, social support, pharmacist, etc.).
GREY LITERATURE				

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
White KR, Stover KG, Cassel JB, Smith TJ. Nonclinical outcomes of hospital-based palliative care. <i>J Health care Manage</i> 2006;51(4):260-73	U.S.	Longitudinal study of nonclinical outcomes associated with opening and operating an inpatient palliative care unit (PCU) at a large U.S. academic medical centre during its first 4 years of operations.	Cost per day to care for patients hospitalized in the last 20 days prior to death significantly less on the PCU than in ICU and other units. Average daily total charges exceeded reimbursement on the ICU and other units but cost on the PCU for the same population was equal to or below the average daily total charges.	Ways to control costs when operating an inpatient PCU were identified and measured: admitting patients directly to the PCU and appropriate use of hospital resources, including staff, ancillary services and pharmaceuticals. Inpatient PCU yielded a cost saving of nearly \$1 million by the third year of operations for the hospital.
Wholihan DJ, Pace JC. Community discussions: a vision for cutting the costs of end-of-life care. <i>Nursing Economics</i> 2012;30(3):170-8	U.S.	Narrative review/editorial	Argues that "the palliative care movement and its connection with the completion of ADs [advance care directives] early in the health care service trajectory ... can significantly decrease aggregate health care costs." [p 170] "The palliative care movement has been linked with cost-containment measures, higher overall family satisfaction scores, decreased pain and increased symptom management, and greater emotional support" [p 171]	Main economic argument based on Morrison et al. (2011) study. Early studies of implementing ADs in acute care settings did not show evidence of cost saving or benefit; it was only when AD and EOL planning was moved into the community that benefits were observed. Cites Canadian study of LTC residents found a nurse-led AD initiative increased the use of ADs and reduced health care services utilization and costs without affecting satisfaction or mortality. "Moving end-of-life discussions upstream and into the community provides an alternative vision to the currently prohibitive and unsustainable cost of dying in this country." [p. 175]
Yang YT, Mahon MM. Considerations of quality-adjusted life-year in palliative care for the terminally ill. <i>J Palliat Med</i> . 2011; 14(11):1197.	Letter to the editor		Letter to the editor regarding use of QALY for economic evaluations of palliative care.	Makes point that QALY is aimed at cost-utility analyses at the population level whereas palliative care is customized and involves identifying which treatments can benefit a specific patient. Argues against use of QALY in studies of palliative care.

REFERENCE	SETTING	METHODS	MAIN FINDINGS	COMMENTS
Yang YT, Mahon MM. Palliative care for the terminally ill in America: the consideration of QALYs, costs, and ethical issues. <i>Med Health Care Philos</i> 2011; e pub Nov 10. doi 10.1007/s1 1019-01 1-0364-6	Review article	Review of using QALY measures for economic analysis of palliative care.	QALY is used as a common measurement to measure benefits gained from a variety of health interventions and gives information on both survival and health-related quality of life of patients. The benefits of palliative care are short-term so comparing with other types of treatment makes it rate poorly. Authors argue that goals of palliative care and QALY are not incompatible, and there may be a way of integrating palliative care into a modified QALY measure. Currently, there is limited data showing that investing in palliative care is financially beneficial as well as ethically sound. Use of QALYs in decision-making and resource allocations could be inaccurate in that goals of palliative and curative treatments are different.	Points out that although palliative care is often thought of as EOL care, it is much broader and includes symptom management and supported/informed decision making. Savings associated with palliative care result from treatments being in line with patients' preferences, values and needs and discontinuing treatments with no further benefit.
Zimmermann C, Riechelmann R, Krzyzanowska M, Rodin G, Tannock I. Effectiveness of specialized palliative care: a systematic review. <i>JAMA</i> . 2008;299(14):1698-709.	N/A (Canada)	Systematic review: 22 RCTs in which palliative care was the intervention and outcomes included quality of life, satisfaction with care or economic cost. Followed Cochrane Review methods in conducting review.	Of the 22 RCTs, 7 assessed costs associated with specialized palliative care and only one reported significant cost savings. Seven of 10 studies looked at family satisfaction with care reported beneficial effect; four of 13 assessing quality of life and one of 14 assessing symptoms showed significant benefit; however, most studies were small and lack statistical power to report conclusive results. Quality of life measures were not specific for terminally-ill patients. Concludes that evidence of benefit is sparse and is methodologically weak.	Outcome measures for avoidance of health care services included number of emergency department visits, number and/or length of hospitalizations, use of hospital resources, advanced care planning, referral to hospice, death at home, and time spent at home. All but one of 7 studies looking at cost were based in U.S. Sole U.K. study found no significant difference in overall costs of care for nurse-led follow up compared with standard care for patients with lung cancer (median cost per patient at 12 months \$696.50 for nurse-led care vs. \$744.50 for usual care, p=0.66). Only U.S. study with significant findings trial of in-home palliative care in 2 HMOs in 2 states; average cost per day \$95.30 for palliative care vs \$212,80 (p=0.02) for usual care, even after adjusting for significantly shorter survival of palliative care group (196 vs 242 days). Of studies assessing utilization of health care services, only one found significant difference: intervention group had higher hospice enrollment among those hospice-eligible (25% vs 6%, p<.001), fewer acute care admissions (average 0.28 vs. 0.49, p=0.04) and spent fewer days in acute care settings (average 1.2 vs. 3.0 days, p=0.03). Of 9 studies measuring number of hospital admission, only 1 showed significant benefit for intervention group (36% vs. 59%, p<.001).



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