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COST-EFFECTIVENESS OF PALLIATIVE CARE IN HOSPITAL: a review of the literature (part 3)

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A. INTRODUCTION

Nearly 30.000 people in Ireland die each year. Of those, about 40% die in acute hospitals.

Despite the technological improvements in palliative home and residential hospice care, the hospital, however, remains a major contributor to health care costs for terminally ill cancer patients (Fassbender et al.2005).

Virtually all persons with serious illness spend at least some time in a hospital, usually on multiple occasions, in the course of their disease or condition. In the last year of life for many people are admitted to hospital, transferred to nursing home, discharged back to hospital, and then readmitted to a nursing home and some deaths are inevitable in hospital.

The growth in the number and needs of elderly people with multiple chronic conditions in coming years underscores the need to create a delivery system that can be responsive to these priorities. The process of dying in a hospital is often reported as inadequate.

One approach for improving the care of people who die in hospitals is to create a formal, hospital-based palliative care (PC) program (Smith et al. 2003). The literature has many examples of evidence-based clinical outcomes of PC, but evidence-based outcomes research that focuses on non clinical outcomes is limited.

It is often difficult for hospitals to access information on best practices that can be used to inform non clinical (business) decisions (Kovner 2003). Thus, less is known about the business outcomes associated with the implementation and delivery of palliative care program.

A systematic literature review was conducted to assemble the evidence on the cost-effectiveness of hospital-based palliative care. In particular the interest is if there is enough evidence to support the contention that palliative care in hospital delivers high quality care for seriously ill patients and their families at the same or lower cost than traditional medical service.

Search strategy

The main search for evidence from scientific studies was conducted through PubMed, using the following extended MeSH terms.

Hospital, death, dying, terminally ill, EOLC, ICU, outpatient, palliative care Unit, palliative care team, palliative care consultation, cost, charges, financing, reimbursement, economics, resources, advance directives, DNR orders, financial, DRG, case mix, LOS, cost effectiveness, hospice, conventional care, consumption, palliative medicine, non-clinical outcomes, financial, business, measuring…

The search on PubMed was limited to English and French language citations. In addition to PubMed, we searched other relevant sources, such as from Scholar

Google, Google. Our search yielded 65 relevant articles, most of them are American studies, but others are Spanish, Canadian, Swedish, Australian or English.
Most of them are cost analysis; a few are economic studies.

The costs of care for gravely ill patients in a hospital are spread throughout the different units involved. The implication is that the cost of care for such patients may be high, but dying or seriously ill patients are not classified as a separate patient population.
It is difficult to track the cost of delivering end-of-life (EOL) and palliative services throughout the hospital. This is in part a result of the fact that cost and cost-accounting systems vary by organization. Additionally, it is often difficult to assign a cost or to quantify some aspects of PC, such as meeting spiritual needs. Therefore, data regarding costs associated with EOLC are often limited.

Furthermore, as most people want to die at home, research has focused on hospice care (the home and nursing home PC) and demonstrated its cost-effectiveness compared with the conventional traditional care in hospital.

We thus found that financial evaluations of PC dealt primarily with the economic effect of hospice care in general and that few dealt with the cost-effectiveness of hospital-based PC compared to conventional care in hospital.

Economic metrics

Cost-effectiveness analysis considers both the effectiveness of a healthcare intervention-its ability to do more good than harm when used in normal circumstances- and the resource required delivering the intervention.

To understand this review on the cost-effectiveness of palliative care, it is first necessary to define some economic terms. Several economic metrics are used to analyse the cost-effectiveness of palliative care in the hospital: the length of stay (LOS), the charges (direct, indirect, fixed), and costs.

- The most common metric for gauging the success of cost containment and reduction is hospital length of stay (LOS). Reducing the LOS purportedly yields large cost savings. The premise has been that by discharging patients more quickly, hospitals reduce overall health care costs, even if patients continue to receive care on an outpatient basis, because such care is assumed to be less expensive.

- The length of stay directly affects the total and indirect costs of care.

- The length of stay may be unnecessary prolonged by failing to establish a plan of care early upon admissions, aggressively treat symptoms, or establish a family meeting.

- Discharge planning is the key to limiting LOS (David, 2001; 2005).

But Taheri et al. (2000) reported that LOS has only a small impact on the cost of a hospital stay. They observe that for most patients, the costs directly attributable to the last day of a hospital stay are an economically insignificant component of total costs. Reducing LOS by as much as 1 full day reduces the total cost of care on average by 3% or less. In future, physicians and administrators should place less emphasis on LOS and focus instead on process changes to use better capacity and alter care delivery during the early part of the stay, when resource consumption is most intense.

- Charges are often driven by reimbursement not by true costs and are therefore a poor surrogate for true costs. (Penrod et al. 2006)

The limitation of studies using charges in lieu of costs is that charge structure can be arbitrary and may not have consistent relationship with costs (Cowan 2004).

- A fixed cost is the expense a hospital incurs regardless of the volume of care it provides.
- Average costs indicate the cost of a treatment divided by the number of patients treated.
- The marginal or incremental cost is the cost of treating an additional patient (David, 2001; 2005).

- The direct costs comprise staff time, drugs and other materials. Direct costs detail the time spent and direct activities undertaken with patients. The type of patient referral and clinical decisions will influence direct costs and revenues.
- Direct cost of care per bed-day is determined by nursing costs and pharmacy costs and is inversely proportional to the number of patients (David, 2001; 2005).

- The indirect costs comprise staff time spent away from the bedside; they can be allocated to individual patients in proportion to the amount of direct nursing care they received.
- Indirect cost is related to the institutional (hospital) ancillary services and should be equally distributed to all units within the hospital (David, 2001; 2005).

- The contribution margin is the net revenue minus direct costs. It does not appear to be related to LOS. It does not take into account indirect costs, which are the main determinant of costs in a long hospital stay.

- All is summed to give a total cost per patient per day and a total cost per patient for the period of the study.

B. REVIEW

Hospital-based PC reduces intensity of treatment in the period leading to death, whatever is the kind of service:

- the consultation team,
- the palliative care inpatient service (PCIS),
- the outpatient service,
- the Palliative care Unit (PCU) or
- the Intensive Care Unit (ICU);

through better planning of care.

1. **Hospital-based PC cost less than conventional care by decreasing the intensity of treatment**

Hospital-based palliative care has been reported to be cost-effective compared with conventional care through their capacity

- to reduce unnecessary resource utilisation and spare expensive technological resources; and
- establish (in the early stages of the illness) and implement Advance Directives and/or Do-Not-Resuscitate orders.

a. **Reduction of unnecessary resource utilisation (tests and drugs) and spare of expensive technological resources**

Studies analysing the cost of care of patient receiving PC found that palliative care was associated with significantly lower diagnostic services, treatments, tests and interventionist procedures.

Chochinov & Janson (1998), in their literature review, suggest that among shorter-term patients, most savings from hospice (home-based and hospital-based) derive from the reduction in use of inpatient services during the last two months. Such reductions account for about 70% of the total cost savings recorded by hospice during the final year.

It is also clear for them that some treatments being offered to dying patients are of little or no real benefit, yet they result in considerable additional costs and risks. They concluded that cost savings reported in PC settings may be function of nearness to death.

Inpatient palliative care consultation

In his study about hospital charges for a community inpatient palliative care program, Cowan **(**2004) reported that inpatient PC consultation is associated with lower mean daily charges for the entire hospitalization and compared to the five-day period before PC consultation.

For very ill inpatients, mean daily charges tended to decrease, as discharge approaches. An important part of this charge decrease was found to be related to lower laboratory and imaging charges.

When examining the reduced charges after the palliative care initiation, Cowan reported a savings of more than $1.8 million per year for the hospital under study.

Lonberger et al. (1997) indicated that daily charges were reduced significantly after the implementation of a palliative care team (PCT) with a large reduction in room charges. Room charges are incurred at midnight. As a result of the study, the room charges for PCT patients in the ICU were reduced to a semi-private room rate at the time of PCT implementation.

The greatest reduction of charges associated with PCT implementation was found in laboratory and radiology testing. Some laboratory and radiology charges occurred on the first day of PCT implementation, but usually no further testing was done on following days. Pharmacy charges (sedation and narcotics given for patient comfort) continued post-PCT and were high.

In the same way, Penrod et al. (2006) compared per diem total direct, ancillary (laboratory and radiology) and pharmacy costs of patients receiving hospital-based PC consultation to usual care patients during a terminal hospitalization. They found that PC patients were 42 % less likely to be admitted to ICU and total direct costs per day lower and ancillary costs (which were also found by Cowan) as well than costs for usual care patients. There was no difference in pharmacy costs.

Fields et al (1989) studied a group of patients with multiple organ failure before the implementation of a Comprehensive Supportive Care Team (CSCT) matched to a group of patients treated by the CSCT in the medical ICU.

No differences were noted in the mortality of patients with multiple organ failure, but there were 50% fewer therapeutic interventions provided by the CSCT than by either the medical ICU or the conventional ward treatment.

O'Mahony et al. (2005) identified the benefits of a hospital-based inpatient PC consultation service as they found significant reductions in charges for ancillary tests and ventilator charges after the PC consultation. Significant savings in hospital charges were also found for the mechanically ventilated patients.

One explanation of the findings is that PC improves communication among patients, their families, and the primary treating physicians about goals of care, including discussion and selection of treatments that result in less use of tests, inappropriate technology, and the ICU.

Furthermore, Lonberger et al. (1997) stated that professional charges decrease, when the focus of care of the patient shifted from curative to palliative.

Inpatient palliative care unit (PCU)

Robinson & Pham (1996) report that the cost of hospice care proved lower than conventional care, by over $1300 for hospital-based hospices (National Hospice study-Mor et al,. 1986).

Most of the costs savings were associated with the last month of life, when conventional care costs rose more rapidly than those of hospice care.

Hospital-based hospice programs provided over tenfold more home-care hours than conventional care. Hospital-based hospice programs controlled pain better than home-care programs, which themselves did better than conventional cancer care.

Smith et al. (2003) compared daily charges and costs of the days prior to PCU transfer to the stay in the PCU, for patients who died in the first 6 months after the PCU opened. They found that for the patients transferred to the PCU, daily charges and costs were reduced by 66% overall and 74% in "other" (medication, diagnostics, etc) after transfer to the PCU.

Coyle et al. (1999) detailed the daily cost of palliative care in the hospital settings before and after admission to the study. Before admission to the study the proportion of costs which were attributable to tests and treatments was 19% in the hospital setting but after admission to the study the proportion fell to 10%.

Imhof and Kaskie (2005) in a study of four hospital-based, best practices EOL care programs found that the provision of evidence-based EOLC can decrease service costs by increasing staff efficiency, and reducing the consumption of expensive service interventions.

Davis et al. (2005) found that total mean charges per admission to the PC unit were 7.800 dollars lower than at similar institutions despite an equivalent severity of illness and longer length of stay and higher mortality in the PC unit. The lower charges were due primarily to lower laboratory and pharmaceutical charges (-33%).

Naik (2004) observed that a PC unit offers painkillers and support, fewer tests, treatments and thus reported that less money is spent on drugs, diagnostics, tests and last-ditch treatments.

He observed that a typical five-day stay for a cancer patient cost 57% less than it cost to house a similar patient elsewhere in the hospital. In this PCU, X-rays, CAT scans, MRI and other diagnostic imaging services are ordered for 10% or fewer PC patients in the five days of their lives, but for more than 62% of non PC patients at the hospital. Similarly, lab tests are ordered for almost all non PC patients, but for fewer than 20% of those in the palliative wing.

Equivalent comparisons showed that a five-day cost of chemotherapy and other medicines was 4 times lower than elsewhere in the hospital, the costs of medical supplies 40% lower and the average daily cost of room and nursing in the PCU is approximately 14% less because there are fewer nurses per patient.

b. Establishing in the early stages of the illness and implementation of Advance Directives (AD) and/or Do-Not-Resuscitate (DNR) orders

Fries and co workers (1993), among others, have suggested that health care costs might be reduced by decreasing the need and demand for medical services, particularly among terminally ill patients, both elderly and others, whose deaths

appear imminent. The most significant savings are in ICU costs by restricting life sustaining treatment

A related proposal to reduce costs at the EOL is reduce "futile care". What is futile care is controversial, but the paradigmatic case is cardiopulmonary resuscitation (CPR) for patients dying of cancer.

Only a few studies demonstrated that increased use of hospice and advance directives (AD) (specifying the patient's preference for the kind of care desired if critically ill and unable to give instructions at that time), and lower use of high-technology interventions for terminally ill patients will produce significant cost savings.

A study by Chambers et al. (1994) showed substantially lower costs for them. Patients were defined as having an advance directive if their medical records contained documentation of a discussion of advance directives within the first 48 hours after admission. For the entire group mean hospital charges of patients without documentation of advance directives were found to be more than three times those of patients with such documentation.

Teno et al. (1997) reported that Advance directives produce major cost savings if prepared early in the disease, well before the terminal hospitalization, not in the last weeks of life, to allow patients to plan their end of life.

ADs documented without further intervention by the third day of serious illness were associated with decreased hospital resource use. But increasing the documentation (inscription in the chart) of pre-existing ADs was not associated with a reduction in hospital resource use.

Their results cast doubt on whether policy interventions that only increase ADs or their documentation will reduce hospital resource use for dying patients. This may be because ADs, as currently used, are not the result of an informed discussion between a health care provider and patient. They conclude that ADs fail to enhance communication and that their use does not result in a reduction of costs.

Yet in the Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment-SUPPORT (1995), data suggested the influence of ADs on EOLC although investigators attributed it to a selection bias. Fins (1997) thinks that the cost savings did not reflect a bias but indicated planning.

In the study by Rapoport et al. (1996) of the timing of DNR orders, 5% of the ICU population who died was considered "extremely sick" and ICU care for them could be medically inadvisable.

They found that early DNR orders may help limit such care. If done earlier in the hospital or ICU stay, for each ICU patient moved from late DNR to early DNR status, ~$10,000 per patient could be saved, and care for ~0.5% of all patients could be limited.

Likewise, DNR orders written at or before hospital admission might decrease the number of ICU admissions, potentially limiting "inadvisable" care. They found that

DNR orders adopted early (within the first 24h) in the ICU stay significantly decreased the number of days spent in both the ICU and the hospital.

In Prendergast's national survey (1998), ~25% of patients died after futile CPR. Based on their classification, there would be only small cost difference savings between limiting care for patient receiving futile CPR and full care with late terminal DNR.

But a shift from open-format ICUs to semi-closed units managed by qualified critical care physician directors would reduce the number of patients with futile or failed CPR, and increase the number of patients having care withheld or withdrawn after failed ICU therapy. Such a change would reduce result in more substantial savings.

Maksoud, Jahnigen and Skibinski (1993) showed that 73 % of patients had a DNR order at the time of death, of those with a DNR order, 17% had executed the DNR order before admission, and 81% had the order written in the hospital. There was no significant difference between the average hospital and physician charges of patients who died with a DNR order and those who died without one. However, mean charges of patients who died with a preadmission DNR order were significantly lower than those of patients with a DNR order obtained in the hospital and those of patients with no DNR order.

Kollef and Ward 1999, demonstrated that patients cared for by non-intensivists in a medical ICU had higher hospital mortality, a higher ratio of actual to predicted mortality, longer ICU and hospital LOS, and lower ICU mortality than patients cared for by intensivists. This and others studies suggest that physicians working in the ICU might be able to reduce costs by prompting the use of advance directives and influencing patients and their families to accept palliative care when they are unlikely to benefit from curative treatment.

But Asch and co workers (1995) demonstrated that intensivists frequently continue life-sustaining therapy despite patient or surrogate expressed wishes that it be discontinued. Given this situation and the prognostic uncertainty discussed earlier, it seems unlikely that even wider use of advance directives can appreciably reduce the costs of ICU care.

Anne Scitovsky (1994) believes that the lack of a closer patient-physician relationship is a large factor in the over treatment that occurs in the health care system in general and in the difficulty of treatment decision making at the EOL.

Advances in medicine have led to with the increased specialization of physicians so that a patient's medical care is fragmented, and often no single physician has a close relationship with the patient and the patient's family. This is especially true in the case of critically ill patients treated in hospital. Under these circumstances, it is not surprising that decisions to forgo further treatment of critically ill patients are difficult to arrive at and are made at a relatively late stage.

However, by reducing use of futile CPR, by setting goals early, and by allowing more care to be withheld or withdrawn when a patient has failed aggressive ICU therapy,

the savings could be more substantial. Current data suggest that changes in PC cost can only come from dramatic changes in how we provide care.

Coordinated care aims at optimizing quality of life by providing hospital care from a PCU, training community professionals, optimizing the cooperation between services, and applying a multidisciplinary approach to the patient's problems and structured ethics review of those likely to die in ICU. Coordinated care with the nurse in charge of resource use has been shown to preserve PC quality and lower cost up to 41%, primarily as a result of decreased hospital days (Raftery et al. 1996; Addington-Hall et al. 1992).

2. Hospital-based PC costs less than conventional care by implementing structured planning

The palliative care services can be paid for from cost savings. These include:

- shortened length of stay in general,
- decreased "bounce back" and emergency admissions on recently discharged patients who return because of symptom management problems,
- decreased stays in intensive care units by, but not limited to, dying people,
- direct admission to PCU,
- prevented transfers between units,
- death outside the hospital.

Depending upon how well referral sources are educated and informed in advance of the initiative, these substantial savings can be documented often within 1-2 years (Passik et al. 2004).

a. Reduction of the length of stay

As Chaix and colleagues (1999) have demonstrated, the ICU costs of individual patients are directly related to the time the patients are cared for in the ICU.

On average, patients who die are more expensive than those who survive: the care of non survivors involved a significantly higher average LOS and mean charges than the care of survivors in the study of Detsky and colleagues (1981).

But Reinhardt (1996) stated that shortening stays in the ICU may not reduce costs: evidence exists that the strategy of shifting patients from apparently high cost to lower cost settings does not result in appreciable cost savings, in part because a significant proportion of anticipated savings are fixed costs.

Luce and Rubenfeld (2002) confirmed that the majority of costs in providing hospital services, including those in the ICU, were fixed and not amenable to cost saving through reducing LOS unless beds were closed and staff numbers reduced.

The apparent economic benefit of alternative care for dying, critically ill patients represents cost shifting rather than cost saving when patients do not die but instead continue to receive care elsewhere.

In calculating the potential cost savings of transferring patients from the ICU to other settings it is essential that the marginal cost of the ICU day is used and not the average cost. This calculation accounts for the fact that although the first day in the ICU may be extremely expensive, requiring one-to-one nursing care and extensive monitoring, subsequent days are likely to consume fewer resources.

Actual cost savings are likely to be significantly less when comparing the marginal cost of saved ICU day with care in a hospital ward or hospice. The most expensive patients are those with the longest ICU LOS but also those with indeterminate outcomes: an outcome different than what was predicted. The results of SUPPORT and other studies indicate that the most expensive ICU patients cannot easily be predicted.

But for Luce and Rubenfeld, the least cost-effectiveness care is provided to a small number of patients. As a result, the costs generated by such patients, although large in per-patient, are small in comparison to the costs generated by patients who are not critically ill. Intensive care is ineffective for a minority of patients, and the majority of patients in ICU benefit from it.

Nevertheless, case control and observational studies of PC and ethics consultation services have demonstrated reductions in costs per day and in hospital and ICU lengths of stay, presumably because of discussions about the goals of care and the resulting facilitation of patient and family decisions about the types and settings of future care (Lilly Cm et al.2000; Schapiro et al. 2005; Smith et al. 2003; Schneiderman et al. 2003; Campbell and Guzman 2003; Raftery et al. 1996; Bruera et al. 1999; Brumley et al. 2003).

Inpatient palliative care consultation

Payne et al. (2002) reported that quality palliative care programs can save anywhere from 40–70% of costs for hospitals. Raftery et al. (1996) also reported approximately 50% savings by using palliative care services along with fewer inpatient days and nursing home visits.

Similarly, Campbell and Fields (1991) looked at an interdisciplinary approach to patients with a Do Not Resuscitate (DNR) status as an alternative for managing terminally ill patients and found costs for managing these patients were reduced. Before the development of the Comprehensive Supportive Care Team (CSCT), most patients with Do Not Resuscitate status remained in the Intensive Care Unit (ICU) until they died.

In his study about hospital charges for a community inpatient palliative care program, Cowan **(**2004) demonstrated that inpatient PC consultation is associated with lower mean daily charge compared with the entire hospitalization and the five-day period before PC consultation. For very ill inpatients, mean daily charges tend to decrease, as discharge approaches. The hospital LOS and charges for inpatient PC consultations

significantly decreased suggesting that there is an economic benefit of inpatient PC consultation.

O'Mahony et al. (2005) identified the benefits of a hospital-based inpatient PC consultation service as they found length of stay was significantly reduced for patients referred for hospice care. This report suggest efficacy of the palliative care service in terms of patient outcomes, provider satisfaction, caregiver satisfaction and cost savings.

Back and colleagues (2005) indicated that early referral to the palliative care consultation team (greater than 60 days prior to death) for cancer patients was associated with fewer hospital admissions, shorter lengths of stay per admission (possibly because of more active symptom control, or more proactive discharge planning), and an increased likelihood of an out of hospital deaths. This suggests that PCS case management for 60 or more days prior to death was associated with decreased use of acute care hospital resources for patients dying of cancer and that a brief consult may not be adequate to decrease resource use.

Fields et al (1989) studied a group of patients with multiple organ failure before the implementation of the CSCT matched to a group of patients treated by the CSCT in the medical ICU. They found that the length of stay decreased by 50%.

Axelsson & Christensen (1998, Sweden), identified that the patients seen by that hospital-based palliative support service utilized fewer institutional days than the control group, according to such parameters as duration of terminal hospitalization, ratio of days at home to total inclusion days, and days at home during the last two months of life.

These three outcome measures all focus on the most care intensive last months of life and appeared to be sensitive enough to identify economic advantages of palliative care intervention. They also found that the palliative support service defrayed savings in hospital care utilization that more than equalled the cost of running the service with a cost of approximately six hospital days per patient to cover the expenses of this low budget palliative support service.

However these potential savings are not real until the number of staff and beds have been decreased. Another reason for caution is that an occasional patient with extraordinary needs will generate exceptionally high costs for the service.

Inpatient palliative care unit (PCU)
Studies of inpatient palliative care units have demonstrated similar results.

Smith and colleagues (2003) found significantly lower daily charges, direct costs, and total costs for patients who died in the inpatient PC unit compared to matched controls who died in other units of the hospital. And comparing the control patients who died outside the PCU to similar patients who died in the PCU, daily charges were 59% lower, direct costs 56% lower, and total costs 57% lower (the savings came from decreased hospital days and shift to outpatient care).

Cowan (2004) studied the effect of a palliative care unit on a hospital from two perspectives: overall length of stay and reduction in daily charges once palliative care was consulted. When examining length of stay, Cowan found a reduction of more than 7 days per visit, with a realization of more than $100,000 in savings per year.

Bruera et al., (2000) demonstrated that a regional PC program reduces the cost of care. They report that the increased funding for the integrated PC program was offset by a significant decreased in the overall cost of PC in the acute-care facilities (significant decrease in the number of PC patient days in acute-care facilities, big shift of billing from specialists to primary care practitioners). Overall, there were estimated significant savings.

Gomez et al. (2006) (Spain) evaluated the resource consumption and costs of PC services compared with the historical data (1992). They observe notably a reduced hospital stay (25.5-19.2 days) and a significant a cost saving.

Byock et al. (2006) in their report on innovative models of PC determine the impact of the models on financing for PC. They found that costs of care, where they could be assessed, were unaffected or decreased for project patients versus historical or concurrent controls.

There was notably less use of routine hospital bed days, intensive care bed days, ventilator care, and primary care visits as patients accessed inpatient PC units and consult services.

It also suggested that provision of PC concurrent with life-prolonging treatment was financially neutral or associated with measurable savings.

Imhof and Kaskie (2005) in the study of four hospital-based services noted that improving EOL care programs reduces the cost of treating patient with life-limiting illnesses. They found that the provision of evidence-based EOLC can decrease service costs in that it also reduces the average length of inpatient stays.

Developing an evidence-based process to identify dying patients earlier and transfer them from inpatient bed to the PC unit, allows for continuity of care and for a significant reduction in service costs.

b. Prevention of unnecessary admission, direct admission to PCU and prevention of transfers between units

Hospitals have begun to invest in PC services to enhance quality of care and because of their measurable impact on reducing ICU and total bed days but also for their efficacy in supporting transitions from high-intensity, high-cost hospital settings to more appropriate and desired care settings, such as the home. (Schapiro et al. 2005; Smith et al. 2003; Schneiderman et al. 2003; Campbell and Guzman 2003; Raftery et al. 1996; Bruera et al. 1999; Brumley et al. 2003; Dowdy et al. 1998; Campbell and Frank 1997; Jordhay et al. 2000; Back et al. 2005).

Several small prospective studies of PC have suggested that PC has resulted in reduction in the number of ED visits and hospitalizations because of the efficacy and comprehensiveness of care coordination in averting crises, (Meyers F, Linder J. 2003- Schapiro R, Byock I, Parker S, et al. Living and dying well with cancer: Successfully integrating PC and cancer treatment. 2005).

Others have associated palliative care and ethics consultation with increases in hospice referral rates and hospice length of stay resulting from hospital and nursing-home-based palliative care programs (Jordhoy et al 2001; Lilly et al. 2000; Brumlay et al. 2003; Smith et al. 2003; Schneiderman et al. 2003; Campbell and Guzman 2003; Raftery et al. 1996; Jordhoy et al. 2000; Meyers and Linder 2003; Schapiro et al. 2003).

Palliative care consultation

O'Mahony et al. (2005) identified the benefits of a hospital-based inpatient PC consultation service as the patients with managed care insurance data demonstrated reductions in charges associated with emergency room visits and hospitalization post their index visit and PC consultation.

There were also significant reductions in inter-unit transfers following PC consultation.

Palliative care inpatient service (PCIS)

EBD

Elsayem et al. (2004) carried out a retrospective study of PC inpatient service in a comprehensive cancer centre. Inpatient PC services, in which the PC team assumes primary care responsibility are lacking in most cancer hospitals. The PCIS do not treat patients who would have previously been discharged to a hospice but do treat patients who would have been cared for in other inpatient units, including the ICU.

To meet acute care criteria, PC interventions may have to be initiated earlier while patients receive acute care and should be part of the active cancer care model rather than duplicate the hospice care model in hospitals.

It is clear that the PCU has attributes distinct from the PCIS: many of the patients are transferred to the PCIS before a final decision is made regarding discontinuation of their cancer treatment and shifting them to comfort care. This allowed a smoother transition to comfort care and bridge the gap between oncology services and hospice care. This PCIS admits patients with severe distress and is capable of discharging the majority of patients.

Elsayem and associates observed that the mean reimbursement rate for all PC charges was approximately 57% and the mean daily charges in the PCIS were 38% lower than the mean daily charges for the rest of the hospital.

More than half of the patients were discharged to hospice.
23% died while they were in the PCIS.

This study showed the clinical utility and financial viability of the PCIS. This is borne out in part by the fact that the inpatient mortality rate did not increase in the months

after the PCIS opened. Patient admitted to the PCIS underwent comprehensive management of multiple symptoms and active discharge planning.

Outpatient PC program

Bruera et al. (2000) found that costs of terminal hospital care for patients during a 12 month period after integrated outpatient CP program was established were significantly lower compared to care during 12 months period before the program was available.

A more recent study of outpatient palliative care found no significant differences in charges but did find some improved outcomes for patients receiving the outpatient palliative care intervention plus usual primary care compared to usual primary care (Rabow et al. 2004).

Back and colleagues (2005) found that patients with cancer receiving inpatient and outpatient PC care services for 60 or more days prior to death used less acute care compared to matched non PC patients.

Inpatient palliative care unit (PCU)

White et al. (2006) reported that the cost per day to care for patients hospitalized in the last 20 days leading up to their death was significantly less on the PCU than on intensive care units and non-PCUs. They used the Finkler and Ward framework (2003) to understand the financial implications of establishing an inpatient PCU.

As depicted in the Finkler and Ward model, the constructs included:

- cost measurement (the average total cost per day for cases ending in death in the hospital, comparing patients in the PCU to patients in other units or non-PCUs);
- cost control (the cost per day for patients transferred from the ICU to the PCU and the number of direct admissions to the PCUs from point of entry/ED);
- value assessment (improved quality of care, overall cost savings to the organization, and support for the organization's clinical, research, and academic missions).

White and associates found that average daily total charges exceeded reimbursement on the ICU and non-PCUs, but the cost on the PCU for the same population was equal to or below the average daily total charges.

Second, ways to control costs when operating an inpatient PCU were identified and measured. Evidence suggests that costs can effectively be controlled by admitting patients directly to the PCU and by appropriate use of hospital resources, including staff, ancillary services, and pharmaceuticals.

Third, the study assessed the value to the institution of operating an inpatient PCU. Results indicated that the inpatient PCU yielded a cost savings of nearly $1 million by the third year of operations.

Average direct cost for patients on the PCU were stable at approximately $700 per day, compared to average direct cost for patients on the ICU and all other units that exceeded $2,500 per day and $1,000 per day, respectively.

Average direct costs decreased for all patients when transferred to the PCU. These findings suggest that transferring patients with life-limiting conditions to the PCU will provide an appropriate alternative to more intensive care settings while reducing costs and opening other beds for patient who require, and will be able to benefit from, more intensive treatment and diagnostic services.

Further analyses revealed that cost control has been associated with an increased number of direct admissions to the PCU. Direct admissions are important because the patient is placed in the appropriate unit from the point of entry. Direct admissions to the PCU avoid costlier stays in more intensive care settings.

The total margin plus the cost of avoiding unnecessary treatment or costly non-PCU stays resulted in a favourable margin of nearly $1 million in the fourth year of operations.

Gomez et al. (2006) (Spain) also observed that there was a significant shift from the use of conventional hospital beds toward palliative care beds, an increase in the death-at-home option (31%-42%), a lower use of hospital emergency rooms (52%-30.6%), and an increase in programmed care.

Compared to the previous resource consumption and expenditure study in 1992, their current PCS policy implied a cost saving of 61%, with greater efficiency and no compromise of patient care.

Byock et al. (2006) in their report on innovative models of PC also found that costs of care, where they could be assessed, were unaffected or decreased for project patients versus historical or concurrent controls.

There was notably less use of emergency room services, intensive care bed days, ventilator care, primary care visits, and urgent care clinic services as patients accessed inpatient PC units and consult services.

C. CONCLUSION

The validity and reliability of these studies' findings is limited by important methodological weaknesses.

First, most of the studies to date are from health care settings (e.g., the United States) that are different from the Irish health care system.

Second, most studies were observational and did not use appropriate comparison groups, multivariate modelling to adjust for confounding variables, and appropriate statistical techniques to reduce bias.

Third, many studies were small with different time frames, limited types of medical costs, variability of reporting and lack of generalizability of the findings.

Whereas well-conducted observational studies can approximate the same level of internal validity and produce equivalent results to randomized controlled trials, the statistical methods needed to assure and absence of bias were not employed in the current studies (Morrison, 2005).

Overall, given the paucity of published studies on the financial impact of palliative care programs, and the inherent difficulties in benchmarking financial outcomes across hospitals, a case study approach seemed both valuable and necessary.

Nevertheless, the current studies suggest that hospice care and AD they do not cost more and provide a means for patients to exercise their autonomy over EOL decisions. Providing timely and intense palliative care throughout the healthcare system is desirable in its own right, independent of potential economic implications.

This findings coupled with those indicating better patient and family outcomes with PC suggest both a cost and quality incentive for hospitals to develop PC programs.

Specifically, in addition to the potential cost savings, PC has been shown to increase quality of care because it reduces pain and more effectively manages symptoms (Khatcheressian et al. 2005). Likewise, the hospital-based PC program has been associated with enabling patients and families to make more informed decisions about difficult EOL issues such as advanced directives and do-not-resuscitate orders (Rady and Johnson 2004). These findings, together with the potential savings, demonstrate that a PCU may represent a substantial benefit to an organization.

A PCU also contributes to the continuity and coordination of care, which is often considered difficult for a large and highly specialized academic health centres (Retchin and Clark 2005).

In summary, hospital-based PC reduces the cost of care while providing the right care on the right unit at the right time. The results translate into improved throughout, improved patient experience and overall cost savings (White et al. 2006).

Passik et al. 2004 suggest that an avenue for future exploration is whether partnering between hospitals and hospice programs can defray some of the costs incurred by the palliative care program in anticipation of cost savings. Imhof and Kaskie (2005) agree stating that partnership with a community-based hospice, which provides EOLC in home and community settings, allow discharge of dying patients to their homes freeing open up acute hospital beds for more profitable admissions.

The cost of EOL education and EOL programs can be reduced by partnering with a local hospice or pastoral counselling organizations. Expert hospice staff can help inform and direct the process of inpatient care services and patient EOL option.

Furthermore, such partnership allows institutions to expand market demand for evidence-based, patient-centred EOL services.

Finally, Barbara Madden, (1996) suggests that as the ability to prolong life increases and the need to contain costs increases, "standards of care" concerning decisions regarding dying will be developed. They could be helpful in preventing conflict and relieving guilt.

ABBREVIATION INDEX

AD/DNR orders	**Advance directives/ Do Not Resuscitate orders**
DRG CMI	**Diagnosis Related Group Case Mix Index**
ED	**Emergency Department**
EOL/EOLC	**End-of-Life /Care**
ICU	**Intensive Care Unit**
LOS	**Length of stay**
OP	**Oupatient**
PCIS	**Palliative Care Inpatient Service**
PCU	**Palliative Care Unit**
PC/PCS	**Palliative Care/ Palliative Care Service**