

Improving Care and Decreasing Costs

Utilizing the Macy Catheter for End of Life Symptom Management

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HOSPICE
BUFFALO

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Challenges Facing the Hospice Industry

INTRODUCTION

The ability to provide excellent end of life care in a cost-effective manner is the goal of every hospice agency. Unfortunately, the business of hospice is becoming more challenging each year. Hospices are questioning their long-term survival with the continued decreases in reimbursement and increased costs of care. The phase out of the budget neutrality factor, sequestration, and the productivity adjustments by Medicare continue to decrease hospice reimbursement and are slated to continue through 2022.

In addition to decreased revenue, operational costs continue to rise. According to a 2016 MedPAC (Medicare Payment Advisory Commission) report, the 2013 average hospice cost of care was \$147 per day, an increase of 1.4% from 2012. MedPAC reported a decrease in profit margins between 2012 and 2013 for all combined hospices from 10.0% to 8.6% and predicted the 2016 margins to be about 7.7%. Meanwhile patient acuity is trending higher with patients having more complex care needs and shorter lengths of stay. Lastly, the increased requirements for quality metrics, and the rapidly changing regulatory landscape has put a large burden on hospices, who have had to add quality staff just to keep up with the regulatory burdens.

Technology that can improve the ability to provide quick symptom control while decreasing the cost and burden of care could help hospice agencies deal with these challenges. This white paper describes how the use of a new medication delivery technology (Macy Catheter®, Hospi Corporation) at a large hospice in upstate New York has improved patient care and nursing efficiency while at the same time decreasing the cost of care.

Innovation to Improve Quality of Life

BACKGROUND: THE MACY CATHETER

While oral and sublingual routes of medication delivery facilitate effective symptom control in most hospice patients, there is still a significant subset of patients for whom these routes are either not functional or fail to control symptoms. Patients with severe agitation, pain, seizures, nausea and vomiting and other severe symptoms many times need an alternative route which are primarily limited to intravenous, subcutaneous and rectal delivery. These options have traditionally mandated ordering new forms of medication (parenteral

or suppository) with the associated additional cost and lag-time for preparation and delivery. The Macy Catheter facilitates the use of oral medications already in the home, allowing these medications to be given rectally, thus avoiding the additional medication cost and delay associated with switching routes of medication delivery.

The Macy Catheter (MC) is a specialized rectal administration catheter with an FDA indication to provide rectal access to administer liquids and medications. The catheter consists of a 14fr tube with a soft balloon on one end and a valved medication port and balloon inflation port on the other. The catheter facilitates ongoing administration of medication or fluids for up to 28 days and can be reinserted during this time-period if expelled with (or removed for) bowel movement. The MC rests on the leg for easy and discreet access without having to expose or move the patient when administering fluids or medication. Medications in solid form are ground with a pill pulverizer supplied in the kit, then a small amount of water is added and the resulting micro-enema suspension is injected into the distal 1/3rd of the rectum via the catheter.

The ability to quickly administer oral formulary medications that are already on-hand via the MC can provide for rapid and ongoing symptom management in general in-patient (GIP), continuous care and routine homecare settings. The MC is especially useful with patients who have terminal agitation, severe pain crises when high dose opioids or adjuvant medications are necessary, seizures, bowel obstruction, or other severe symptoms.

In the hospice inpatient unit (HIU) the catheter facilitates rapid treatment of symptoms without the cost and complications associated with parenteral medication and fluid delivery. It provides a more home-like atmosphere compared to parenteral medication delivery as it is not visible and requires no pumps, needles or IV lines. Unlike needles which can be uncomfortable, the MC is reported both anecdotally and in the literature to be comfortable for the patient and does not run the risks associated with parenteral access such as infection or infiltration. It provides a good discharge option from the HIU to home as it is easy and safe for caregivers to use. In home care, the MC can facilitate more rapid control of symptoms than any other option available when oral and sublingual routes fail by allowing nurses to control symptoms with medication already at the bedside, avoiding the lag-time of having to order and deliver alternate forms of medication.



In the home hospice setting, the nurses carry the MC in their vehicle or nursing bag, which allows them to place the catheter immediately when there is an emergent need. Once the nurse is in the home, a quick phone call or text to the physician or clinical pharmacist is all that is required to give the oral medications already present via the rectal route.

The Hospice Buffalo Experience

THE MACY CATHETER PROGRAM AT HOSPICE BUFFALO

Hospice Buffalo provides routine hospice care in both private homes and long term care facilities and provides general inpatient care in a 22-bed hospice inpatient unit (HIU) in Erie County, NY. In 2016, the agency cared for approximately 4,134 hospice beneficiaries including 1,609 home care patients, 1,062 long term care/assisted living patients, 815 hospital patients, and 648 HIU patients.

Hospice Buffalo recently implemented the Macy Catheter program with the goal of improving patient outcomes while simultaneously decreasing the burden and cost of care. The program was piloted in the last quarter of 2015 in their 22-bed hospice inpatient unit (HIU) followed by a rollout to the homecare teams in the first quarter of 2016.

The agency cost of the MC's in 2016 was \$0.15 per patient day (\$25,415 in total cost for the MC program divided by 168,054 total days of care). As described in the next section, the results of the slight increase in supplies expense leads to much larger direct savings in pharmacy costs and indirect savings via nursing efficiency. The utilization of the Macy Catheter has led to significant cost savings and improved nursing efficiency at Hospice Buffalo. In 2016, Hospice Buffalo utilized 160 MC's in a total of 25% of the HIU patients and 139 MC's in about 9% of the home care patients who had access to the catheter. This did not include the routine home hospice patients in Skilled Nursing Facilities as the agency had not trained facilities in use of the catheter at the time of the study.

\$92,302 Savings in the Hospice Inpatient Unit

SWITCHING FROM PARENTERAL TO RECTALLY ADMINISTERED ORAL MEDICATION

The largest cost savings in the HIU occurred from the ability to switch from the parenteral route to oral medication deliverable rectally via the MC. The cost of numerous parenteral medications has markedly increased over the last few years and in 2016 the pharmacy noted an alarming increase in parenteral medication costs in the HIU despite the increased usage of the MC.

In February 2017, Hospice Buffalo initiated a set of guidelines to curb these expenses by further encouraging and directing the use of the MC. The guidelines included instructing clinicians to try the MC as the first line alternative when a patient was unable to swallow and sublingual was ineffective. In addition, the agency now asks patient families to bring the patient's oral medications to the unit to further reduce waste and costs. The medication that had the biggest cost reduction impact was the decreased use of parenteral Methadone. Methadone is still utilized frequently on the unit in oral form via the MC with good results. Clinicians on the unit report that effective symptom relief has been maintained with these changes.

45% REDUCTION IN COST

The first month the guidelines were in effect, medication costs in the HIU dropped \$12.76 per patient day (PPD), or 40% from \$32.11 PPD to \$19.35 PPD. The average PBM costs from June of 2016 through January of 2017 before the policy change were \$35.52 PPD dropping to \$19.67 PPD from February to May after the change, representing a 45% decrease in medication costs. The annualized medication cost in the HIU prior to the change was \$254,439 dropping to \$142,587 after the policy change for an annualized gross savings of \$111,852 in the HIU. We calculated net annualized savings by subtracting the 2017 projected annualized MC program cost in the HIU from the annualized gross savings. After the new guidelines went into effect in the HIU there was a 43% increase in MC utilization in the HIU. Based on the new utilization rate, the HIU is projected to use 230 catheters in 2017 at a cost of \$19,550. Subtracting this from the gross savings projects a net savings in the HIU of \$92,302 for 2017. Figure 1 shows the monthly medication cost in PPD and the average cost before and after guideline changes throughout the time-period in the HIU.



Other IPU Savings - Parenteral Infusion Costs

INFUSION COST REDUCTION

Infusions are billed through an infusion pharmacy at a per diem rate that is separate from PBM costs incurred when using bolus injected medication. Medication infusions and hydration incur a per diem infusion fee that costs an average of \$40 per day plus the cost of the medication and an additional infusion nurse visit charge if needed. The HIU has been slowly replacing medication and hydration infusions for medication and hydration via the MC producing a notable reduction in infusion expenditures.

There are large monthly infusion cost fluctuations related to intermittent utilization of expensive infusions such as TPN, antibiotics or other medications which make a decreasing cost trend hard to see on a month to month basis. But when analyzing these expenditures in 6-month increments, there is a steady decrease in these costs over the three consecutive 6-month periods since the MC was implemented. Table 2 shows the decreased trend in infusion expenditures in the HIU. From January to June of 2016 costs averaged \$1.85 PPD, dropping 6% to \$1.74 from July to December. A steeper decline is noted after initiating the new guidelines, dropping another 10% to \$1.56 PPD from January 2017 to May of 2017. We can conclude that this 16% decrease in cost is at least partially related to the MC replacing infusions because no other variables have changed in our infusion practices on the unit. This represents an additional projected \$1,703 in annualized savings in 2017 over the 2016 average infusion cost in the IPU. These savings are not included in the reported net savings as the fluctuations in cost from month to month were high and other variables may be affecting the data.

NURSING TIME

The HIU manager and clinical staff report the MC has improved nursing efficiency compared to the use of SQ ports. They report that SQ ports take more nursing time to place and maintain than the MC. This time increase is related to SQ port placement, labeling, site assessment, and documentation of, at times, numerous ports per patient. They report MC placement takes about 5 minutes, and there is no associated maintenance or complications unless the catheter is expelled by the patient, in which case it must be reinserted which takes an additional 5 minutes. They also report a smaller amount

of time spent disposing narcotics and counting, as two nurses must perform this job each shift. Medications in tablet form are easy and quick to count and dispose compared to parenteral medication which are more tedious to measure and dispose.

Macy Catheter VS the Alternatives in the Home Hospice Setting

Hospice Buffalo was not able to project quantified aggregate home care savings with a direct correlation to MC use with the accounting data available due to confounding variables. The agency was able to perform qualitative cost and efficiency comparisons between the Macy Catheter and the other alternatives used. The agency identified significant potential savings using the Macy Catheter in the home care setting in the categories of medication delivery charges, parenteral and suppository medication costs, infusion supply costs, and decreased nursing time.

Using Medication Already at the Bedside = Decreased Cost and Faster Symptom Management

PARENTERAL VS. ORAL MEDICATION VIA MACY CATHETER

The ability to use medication in oral form already in the home is likely the biggest cost savings associated with the MC in the home setting (as it is in the HIU). Most parenteral medications given in home care patients at Hospice Buffalo are given via bolus injection through subcutaneous ports as in the HIU. It has been demonstrated in the HIU analysis that decreasing these parenteral medication costs using the Macy Catheter and oral medications is cost effective. This model also applies to home care but with the addition of the cost of the medication and supply delivery.

Another less utilized parenteral option at home is infusion via a PCA (Patient Controlled Analgesia) pump. Infusion costs include a \$40/day per diem charge in addition to the cost for the medication, a delivery charge, and an additional infusion nurse visit cost if needed. Figure 3 shows the comparative cost for an infusion morphine, a relatively inexpensive parenteral drug, over a 7-day period compared to the cost of oral morphine given via the MC. The model assumes a \$40/day charge



for the pump, a one-time \$50 delivery charge and a \$20 charge for two morphine PCA cassettes that need to be changed every 4 days. The model does not include any cost for the parenteral catheter or any supplies needed for parenteral delivery or infusion nurse visits for troubleshooting. The graphs show parenteral infusion to be more expensive than the MC on the first day, with the MC option becoming even more cost effective every day thereafter. Figure 4 shows the daily cost of the same infusion. These graphs demonstrate that the parenteral cost is more on day one and by day 7 the parenteral daily cost is 4 times the cost of the MC. This trend continues and by day 14 the daily parenteral cost is 8 times the MC daily cost, at 21 days, 12 times the cost and so on.

Cost-effectively providing excellent end of life care

SUPPOSITORIES VS. MC COST

There are numerous clinical downsides of using suppositories which include; a lag-time prior to treatment; family/CG reluctant to use suppositories; repositioning of the patient and exposing private areas with each dose; discomfort with each insertion; and questionable or variable absorption in dehydrated patients. In addition, the agency analysis found medication administered via the MC to be less expensive and burdensome than the use of suppositories. For suppository preparation, the agency pays a compounding fee of \$20 plus the cost of the medication plus a delivery charge. To calculate a modest estimate of the cost of a suppository intervention in the home we figured an average delivery fee on regular days, not after hours or holidays, to be about \$50 plus a \$20 compounding charge, plus a \$10 medication cost for a relatively inexpensive medication is about \$80. After hour delivery or more expensive medications would cost more. There is an associated increase in nursing time to follow up on the status of the patient since there is a lag-time for medication delivery and an associated delay in the intervention and symptom control. This happens at least once if not several times with the patient until the medication arrives and is given and documented as effective. If the caregiver needs instruction, or is uncomfortable inserting a suppository another nursing visit is many times necessary. Assuming a nurse salary at a minimum of \$50/hr in New York and an additional minimum time of 30 minutes calling the MD, the pharmacy, checking on the patient status, and assuring the patient is comfortable after administration cost an additional \$25 minimum, making the option more expensive, more

burdensome, and less clinically beneficial than utilizing the MC.

DECREASED NURSING TIME

Symptom management challenges can be costly from a nursing time perspective. Additional nurse visits and prolonged visits due to difficulty managing symptoms can be burdensome to an agency and the nursing staff. Clinical visits, phone calls from anxious patients and caregivers, and calls to the pharmacy, MDs, and other team members related to symptom control issues add to labor cost and qualitative burden on the clinician and agency. Although these costs were not measured in this study, we believe the MC's ability to immediately facilitate symptom management efforts in a single visit utilizing medication resources already present can significantly decrease the cost and burden of care in the home setting.

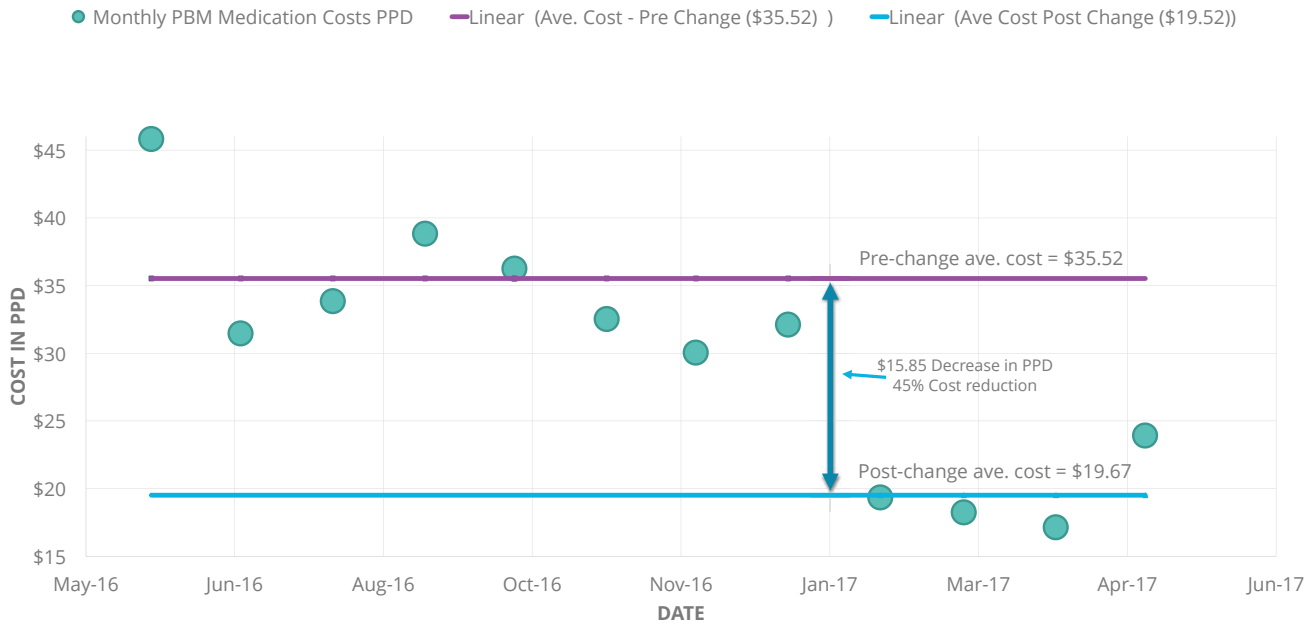
MEDICATION DELIVERY CHARGES

Medication delivery charges need to be considered when comparing the MC cost to other alternative routes of administration because the use of the MC in the home setting can avoid these transportation costs. When these costs are combined with the cost of the new medication being delivered and the time it takes to get and place the order, the cost can easily surpass the cost of utilizing the MC. At Hospice Buffalo, courier fees are a compilation of a base rate plus mileage, time of day, and holiday/weekend fees. Daytime fees run from \$28 to \$74 with a \$5 Stat delivery fee. After-hours the cost is \$39 to \$101. Weekend and holiday rates are double these base rates.



Conclusion

The Macy Catheter has improved the ability for Hospice Buffalo to facilitate quick and effective symptom management while simultaneously decreasing cost, improving nursing efficiency and decreasing the burden of care. The agency concludes that the cost of utilizing the Macy Catheter is insignificant compared to the clinical, quality and cost savings benefits of using the technology. The projected gross savings in the HIU for 2017 is \$111,852, far exceeding the cost of the entire program agency-wide. More savings can be achieved with increased utilization.

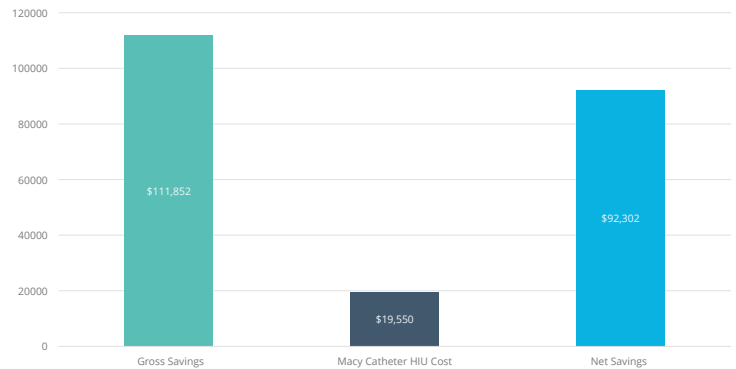


In February 2017 Hospice Buffalo initiated Macy Catheter use guidelines in the IPU that included using the MC as the first line alternative when the oral route was not effective. In addition families were asked to bring in oral formulary medications from home when the patient came into the IPU. This resulted in a dramatic 45% decline in their PBM costs in the IPU. As you can see by the graph the pre-guideline PPD cost was \$35.52 dropping \$15.85 PPD to \$19.67

Hospice Buffalo - Projected 2017 IPU Savings

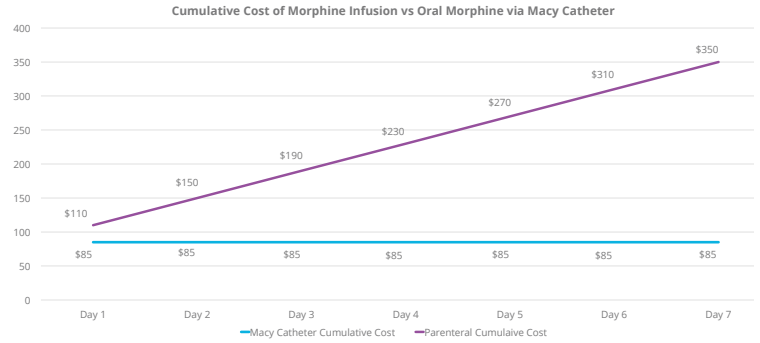
PER PATIENT SAVINGS

Total Patients (640) = \$144 per patient
 MC Patients (230) = \$401 per MC patient



Daily Cost of Morphine Infusion vs. Oral Morphine via Macy Catheter

Hospice Buffalo pays \$40 per day for pump rental, a \$50 charge for delivery (varies, can be as high as \$200) then there is the medication cost of \$10 per cassette for morphine which is a fairly inexpensive drug. Notice at 7 days the infusion cost is \$350 compared to only \$85 for the MC. At day 30 the infusion cost would be about \$1500 and the MC would still only by \$85.



IV COSTS

- \$40/day per diem
- \$50 delivery charge
- \$20 for 2 PCA cassettes MS

Average 6-Month Period Infusion Costs in the HIU

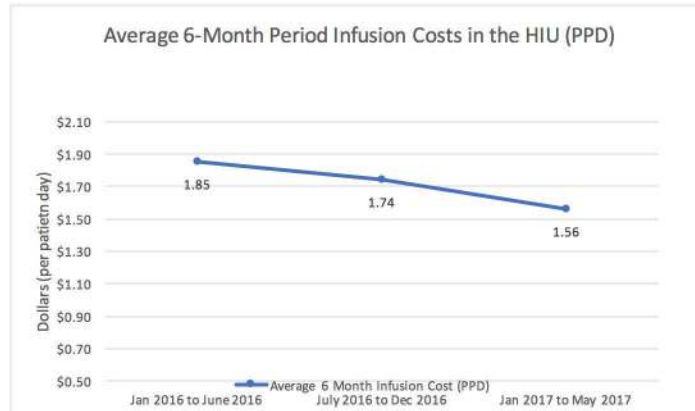


Figure 2: Ave. 6-Month Infusion Cost in the HIU

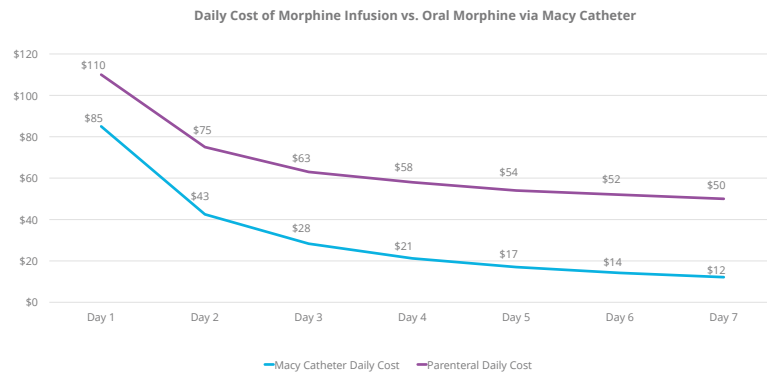


Cumulative Cost of Morphine Infusion vs Oral Morphine via Macy Catheter

Note that by day 3 the daily parenteral cost is 3X the MC cost and by day 7 it is 4x the cost. This trend continues and at day 28 the daily parenteral is more than 13X the MC daily cost.

IV VS. MC COST DIFFERENCE

- 4X MC at 7 days
- 7.5X MC at 14 days
- 11X MC at 21 days
- 14X MC at 28 days

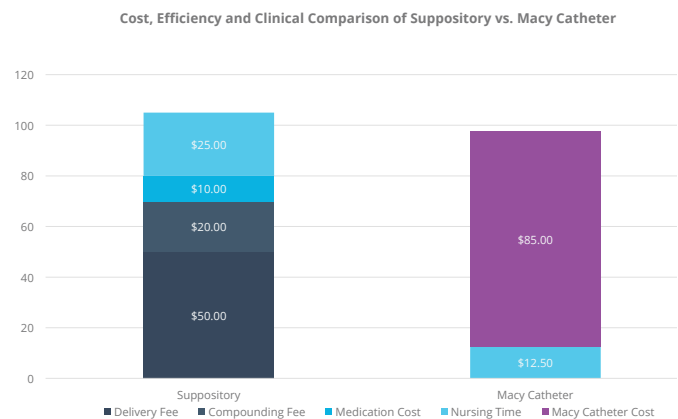


Cost, Efficiency and Clinical Comparison of Suppository vs. Macy Catheter

This graph shows that the cost of suppositories vs the Macy Catheter are more costly even for inexpensive medications, but more importantly is the clinical downsides of suppositories are all addressed with the MC.

CLINICAL CHALLENGES WITH SUPPOSITORIES

- Hours of lag-time prior to treatment (delivery)
- Ongoing repositioning and exposing private areas
- Difficult to titrate for changing symptom intensity
- Uncomfortable vs. MC comfortable
- Delayed and variable absorption
- Family/CG reluctant to use



Sources

¹Due to a change in PBM and discontinuation of an auto-dispensing unit we did not do a 12-month analysis of 2016 as it would have made the results from the first half of 2016 incomparable to the second half of 2016 and the post guideline results in 2017.

²Hospice Action Network. *Current State of the Hospice Community (2013)*. http://hospiceactionnetwork.org/linked_documents/get_informed/policy_resources/CurrentStateofHospice_Nov2013.pdf. Accessed 5/11/2017

³Medicare Payment and Advisory Commission (MEDPAC) *Hospice services: Assessing payment adequacy and updating payments. Report to the Congress: Medicare Payment Policy*. March 2016. <http://www.medpac.gov/docs/default-source/reports/chapter-11-hospice-services-march-2016-report-.pdf>. Accessed 5/12/2017

⁴Medicare Payment and Advisory Commission (MedPAC). "Hospice services: Assessing payment adequacy and updating payment," in *Report to the Congress: Medicare Payment Policy*. June 2016. <http://www.medpac.gov/docs/default-source/data-book/june-2016-data-book-health-care-spending-and-the-medicare-program.pdf>. Accessed 5/12/2016

⁵Phenobarbital study

