Appendix B
Cost Accounting Template

Construct Service Unit Grid
"Filling-In" the data on the Service Unit Grid should start with program intervention resources, including days/hours of administrator time, training time, transportation services and other program inputs. Generalizing intervention resources can result in loss of important service units. Grid construction should start with internal identification or accounting of all services for the program under consideration.

The illustrative service grid is broken into parts and starts with Inpatient Hospital (item 1) and goes through Community Services (item 13).

Health Care Service	**Simple Counts**	**Adjusted Counts**	**Billing Units**
1. Inpatient Hospital[1]	▪ Hospital admission ▪ Hospital days	▪ Hospitalization by diagnosis and/or major service ▪ ICU/CCU/Room day + length of stay	▪ Hospitalization (all days – adjusted for diagnosis = DRG) + length of stay ▪ ICU/CCU/Room day + length of stay ▪ Rehabilitation Unit + length of stay ▪ ICD-9 procedures
Hospitalization is the most clear-cut of medical services. *Note that hospitalizations also include a physician component.*	*Medicare 2001 payments for "typical" end-of-life hospitalizations averaged $6,829 for 5.9 days, or $1,154 per day.* *Medicare payments are about half to two-thirds as much as commercial payments.* *With cost-to-charge ratios for hospitals averaging 50%, Medicare Payment may proxy institutional cost as well as payer cost.* *Payments are made for initial hospital care.* *99222 $114.01 (mid-level of intensity) Subsequent hospital care* *99232 $56.24 and Hospital discharge day* *99238 $67.72. Thus a three-day admission would cost, at least $238.*	*Levinsky et al. provide resource use (% using) for ICU, Catheterization Dialysis,Ventilator, Pulmonary artery monitor -but not cost of each (payments are by DRG)* *Use of ICU and procedures all add to physician cost. Many diagnoses (especially surgical diagnosis) have implied physician services.*	*Adjustments for DRGs – Diagnosis Related Groups) common to end-of-life care in one study given on the hospital worksheet.* *Note that payment amounts are total, and include the patient-paid portion, the deductible, which is $792 (Per Benefit Period) in 2001.*

Health Care Service	Simple Counts	Adjusted Counts	Billing Units
2. Outpatient *"Outpatient" covers many services – some similar to physician office visits, some like hospitalizations.*	▪ Visits + services ▪ Pharmacy ▪ Injectibles ▪ Chemo ▪ Home infusion ▪ Imaging *For outpatient visits common to the average of those observed in one study, $250 for the facility component and $175 for the physician component total $425. All services received during a visit need to be considered costs.*	▪ Visits by type of service received + services *Examples: radiation single area (300) = $99.48, radiation 3 or more areas (302) = $412.47.*	▪ Visits by ambulatory visit groups AVG / ambulatory patient classification APC + services *APCs (Average Per Capita Costs) include a National Payment Rate (local area wage adjusted) and a Coinsurance rate (averaging 20%). For APCs, the 2001 minimum is $0 and maximum is $14,250.*
3. Emergency Room *Emergency room visits, like outpatient care, cover a variety of services.*	▪ Visits *The distribution of ER visits may differ for palliative and end-of-life care, but the overall average is for mid-level visits, for which the total Medicare payment is $168.75.*	▪ Visits by type of service *Including additional procedures lends greater clarity on resource use.*	▪ Visits by relative value units -- RBRVs/ RVUs (physician) and/or APC (facility) *RVUs:* *Medicare/Average* *99282 M=27.93 A=66* *99283 M=62.74 A=138* *99284 M=97.94 A=215* *APCs:* *610 Low Level $67.32* *611 Mid Level $106.01* *612 High Level $160.27* *+ additional services, procedures*

Health Care Service	Simple Counts	Adjusted Counts	Billing Units
4. Physician[2] *Physician services are paid by fee schedules by most payers. There is no clear concept of "cost" for physicians, since fees are income. Radiology, anesthesiology and pathology in-hospital are included in the DRG payment. Some primary care physicians are capitated to care for patients within their panel; therefore, they do not bill for component services or visits of those patients.*	▪ Visit to physician *Routine Office Visit are generally paid by duration of visit* *Level 1 <15, $21* *Level 2 15-29, $37.49* *Level 3 30-44, $52.41* *Level 4 46-60, $82.64* *Level 5 60+, $120.90* *The majority of visits (1 hospice study) are level 3.* *Among Medicare and fee surveys, $50 is common.*	▪ Visits to primary care physicians (evaluation and management) ▪ Visits to specialists (by specialty) ▪ Visits to clinics ▪ Telephonic consultations *Visits associated with procedures vary substantially in cost.*	▪ Visits by CPT-4 or service codes *Note that payment amounts are total, and include the patient-paid portion, the deductible, which is $100 (Per Year) for Medicare in 2001 and coinsurance, which is 20%.* *Primary care physician fees are similar among Medicare and private insurance. Private insurance fees for specialist procedures average double Medicare rates. Medicaid averages 65% of Medicare rates.*
5. Laboratory Tests *Most individual lab tests are not very expensive, $10-$30, but often times many tests are ordered.*	▪ Number of tests *Counting the number of tests can be difficult, as institutional "shorthand" is often used. One unpublished hospice study used $25 as an average cost/test.*	▪ Number of tests by type and location	▪ Tests by CPT-4 (physician) and/or APC (outpatient) ▪ Included for inpatient care

Health Care Service	Simple Counts	Adjusted Counts	Billing Units
6. Drugs[3] *Medications may be delivered in hospital (included in most prices), provided to patients on an outpatient basis or provided to patients during treatment (IV).*	▪ Number of prescriptions (separate from Cancer chemotherapy and other services) *For medications provided during treatment, there may also be a provider payment.*	▪ Number of prescriptions by type / medication / dose / time	▪ Drugs by uniform code
7. Therapy and Counseling	▪ Counseling visits	▪ Visits by provider type (social worker, chaplain, volunteer, physician, physical therapist, occupational therapist, dietitian, other therapist) ▪ Caregiver after-hour call ▪ Volunteer hours	▪ Visits and length (hours, minutes) by provider type and CPT-4 (if applicable)
8. Nursing Home[4]	▪ Admission and length of stay *For SNF (skilled nursing facility) care, Medicare average rates for 2001:* *Urban: $295/day* *Rural: $304/day*	▪ Admission and length of stay by diagnosis and facility type (SNF, nursing home, etc.)	▪ Admission and length of stay by diagnosis and facility type (SNF, nursing home, etc.) ▪ Days – adjusted for resource utilization groups (RUGs) or activities of daily living (ADLs) *Adjustments for RUGs given on the SNF worksheet.*

Health Care Service	Simple Counts	Adjusted Counts	Billing Units
9. Home Care[5]	▪ Number of visits *Total average per visit $43.54, which may include many services.*	▪ Visits by provider type (skilled nurse, occupational therapist, respiratory therapist, etc.) ▪ And service *Nurse Practitioner Visits E&M visits receive 85% of the physician fee.* *Nurses get paid Prospective Payments System (PPS) rates.*	▪ Visits by provider type ▪ Days for respite and continuous and inpatient care and professional care
10. Hospice[6]	▪ Admission ▪ Number of visits	▪ Number of visits (duration of course of care) by type (home visit, spiritual visit, bereavement visit, volunteer visit, and hospice days)	▪ Visits by provider, treatment and time per visit
11. Medical Equipment	▪ Durable medical equipment (DME) by product class (respiratory, physical therapy, etc.)	▪ DME by product type ▪ Consumables	▪ DME by HCPCS Code ▪ Consumables
12. Paid/Unpaid Caregiving[7]	▪ Days of care	▪ Hours/day, days/week by provider type ▪ For family/friends, days/hours work lost; loss of job; loss of job benefits	▪ Days of paid care, by provider type ▪ For family/friends, days/hours work lost; loss of job; loss of job benefits
13. Community Services	▪ Number of services	▪ Services by type (counseling, day care, financial, legal, meal assistance, pastoral and transportation)	▪ n/a

[1] Charge data over all DRGs (Diagnosis Related Groups) is a rough proxy for the cost of hospital days. Mean charge data can be divided by length of stay measured by number of days. An example of cost data based on Medicare, Medicaid and other types of charges for hospital stays is illustrated below with the data taken from HCUPnet, Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality, Rockville, MD (http://www.ahrq.gov/data/hcup/hcupnet.htm.).

Mean Charges and Length of Stay by Patient and Hospital Characteristics for All Discharges

	Total Number of Discharges	LOS, days (mean)	Charges, $ (mean)
U.S. Total	35,406,187 (100.0%)	4.9	11,294
By Payer			
Medicare	12,246,563 (34.6%)	6.3	14,524
Medicaid	6,977,169 (19.7%)	4.9	9,466
Commercial	13,199,769 (37.3%)	3.7	9,542
Uninsured	1,683,725 (4.8%)	3.9	8,736
Other	1,220,183 (3.4%)	4.4	11,639
Missing	78,778 (0.2%)	5.8	11,842
By Region			
Northeast	7,424,394 (21.0%)	5.7	11,611
Midwest	8,331,919 (23.5%)	4.8	10,281
South	13,098,407 (37.0%)	4.8	10,740
West	6,551,467 (18.5%)	4.2	13,386
By State			
Arizona 1999	560,237	3.9	13,979
Iowa 1999	353,393	4.5	8,703

Patients admitted to an intensive care unit present additional issues of costing. The database: data used in the *100 Top Hospitals: ICU Benchmarks for Success* study are from Solucient's DRG and hospital databases for 1998 and 1999, the two most recent years available.

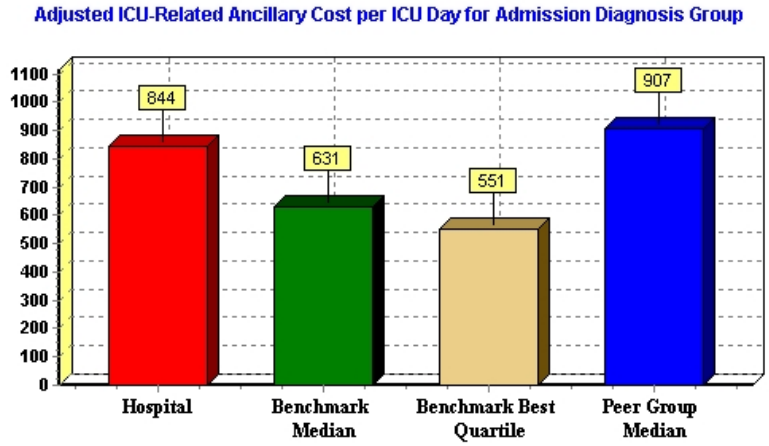
Data used to calculate the clinical measures for this study are from the DRG database. This database is based on the publicly available MedPAR (Medicare Provider Analysis and Review) data set from the Health Care Financing Administration. Data from Solucient's hospital database are also used to calculate hospital-specific cost-to-charge ratios that are applied to ICU-related ancillary revenue center charges. The primary source of these data is the Medicare costs report, which is filed annually by every U.S. hospital that participates in the Medicare program.

The patient population is stratified into three groups that cover both a range of ICU-related procedures and diagnoses and capture different clinical pathways through which a patient enters an ICU:

1. Patients who present with medical diagnoses, such as stroke or pneumonia ("Admission Diagnosis Group").
2. Patients who enter an ICU after surgery ("Primary Procedure Group").
3. Patients on a mechanical ventilator for at least four days ("Mechanical Ventilation Group").

   These are the most critically ill patients in the study.

An example of cost per ICU day for the Admission Diagnosis Group is shown below:



Source: http://www.100tophospitals.com/Studies/icu00/methodology.htm.

[2] Percentage of Total Responses by Agreement With Experts:

Case	Undercode %	In Agreement %	Overcode %
Established patients	32.7*	51.6*	15.6*
New patients	1.1*	17.3*	81.5*

*P < .001.

- King MS, Sharp L and Lipsky MS. "Accuracy of CPT Evaluation and Management Coding by Family Physicians." *Journal of the American Board of Family Practitioners,* 14(3): 184-192, 2001.

[3] Physician offices and hospitals are reimbursed for drugs and biologicals based on 95 percent of the AWP (Average Wholesale Price).

Chemotherapy – Professional	Code	Medicare
IV infusion	90780	$44.38
IV injection SQ	90782	$4.59
IV injection	90784	$19.13
Pulse Oximetry	94760	$4.21
Chemo, sub cut/IM	96400	$5.36
Chemo, push technique	96408	$38.64
Chemo, infusion	96410	$61.60
Chemo, infusion add-on	96420	$50.12
Chemo, intra arterial, push tech.	96420	$50.12
Intra arterial infusion	96422	$49.35
Intra arterial infusion w/pump	96425	$57.00
Chemo into CNS	96450	$109.04
Pump refill, mant. (portable)	96520	$35.58
Pump refill, mant. (implant.)	96530	$42.47
Chemo injection	96542	$78.05

Illustration: Six months (1/2) of one patient's recorded use.

MED	Dose	Route	Start	End	Price
Axid	150mg BID	po	3/15/99		
theophyline	200mg TID	po	3/15/99	2/10/00	
potassium Cl	10meq TID	po	3/15/99	2/10/00	
Micronase	5mg qd	po	3/15/99	2/10/00	
Aldactone	25mg BID	po	3/15/99	2/10/00	
Darvocet N-100	1-2 q4hrs prn	po	3/15/99		
Ativan	0.5mg QID prn	po	4/12/99		
quinine sulfate	260-520mg qhs	po	4/20/99		
Elavil	50mg qhs	po	5/27/99		
Zofran	8mg q8hr x 5d with chemo	po	6/21/99	9/30/99	
Cytoxan	885mg q21-28d	IVPB	7/1/99	9/30/99	?
adriamycin	71mg q21-28d	IVPB	7/1/99	9/30/99	
5 FU	885mg q21-28d	IVPB	7/1/99	9/30/99	
Kytril	1mg ac chemo	IVPB	7/1/99	9/30/99	
naproxen	375mg BID	po	7/15/99	8/15/99	?
Cipro	500mg BID x 7d	po	7/18/99	7/25/99	

Cytoxan (cyclophosphamid...)	25mg (30 tablet)
Cytoxan (cyclophosphamid...)	25mg (60 tablet)
Cytoxan (cyclophosphamid...)	25mg (90 tablet)
Cytoxan (cyclophosphamid...)	25mg (100 tablet)
Cytoxan	2gm (6 sdv)
Cytoxan	500mg (12 sdv) *
Cytoxan (cyclophosphamid...)	50mg (30 tablet)
Cytoxan (cyclophosphamid...)	50mg (60 tablet)
Cytoxan (cyclophosphamid...)	50mg (90 tablet)
Cytoxan (cyclophosphamid...)	50mg (100 tablet)

* RxUSA.com (12) $240
1 week mo, 6 months = 3 units = $720.

A typical dose of Imuran or Cytoxan is 125 to 150 milligrams (mg) a day given orally. A low dose is 75 mg or less. Cytoxan can be given at a much higher dose intravenously on a monthly basis. This may be quite effective for severe kidney disease and may help to avoid some of the side effects that occur with daily oral dosages of this drug (http://www.destinationrx.com/prescriptions/).

Anaprox (naproxen)	275mg (30 tablet)
Anaprox (naproxen)	275mg (60 tablet)
Anaprox (naproxen)	275mg (90 tablet)
Anaprox (naproxen)	275mg (100 tablet)
Anaprox DS (naproxen)	550mg (30 tablet)
Anaprox DS (naproxen)	550mg (90 tablet)
Anaprox DS (naproxen)	550mg (100 tablet)
Naprosyn (naproxen)	125mg/5ml (300 suspension)
Naprosyn (naproxen)	125mg/5ml (480 suspension)
Naprosyn (naproxen)	250mg (30 tablet)
Naprosyn (naproxen)	250mg (60 tablet)
Naprosyn (naproxen)	250mg (90 tablet)

Naprosyn (naproxen)	250mg (100 tablet)
Naprosyn (naproxen)	375mg (30 tablet)
Naprosyn (naproxen)	375mg (60 tablet)
Naprosyn (naproxen)	375mg (90 tablet)
Naprosyn (naproxen)	375mg (100 tablet)
Naprosyn (naproxen)	500mg (30 tablet)
Naprosyn (naproxen)	500mg (60 tablet)
Naprosyn (naproxen)	500mg (90 tablet)
Naprosyn (naproxen)	500mg (100 tablet)
Naproxen (naproxen)	125mg/5ml (300 suspension)
Naproxen (naproxen)	125mg/5ml (500 suspension)
Naproxen (naproxen)	550mg (30 tablet)
Naproxen (naproxen)	550mg (60 tablet)
Naproxen (naproxen)	550mg (90 tablet)
Naproxen (naproxen)	550mg (100 tablet)

Naprosyn (naproxen) 375mg (30 tablet)

Store	Generic	Brand
AARP	$8.85	$36.40
Costco.com	n/a	$36.79
Eckerd.com	$12.55	$34.90
FamilyMeds.com	$9.87	$37.87
PrescriptionOnline	$6.00	$27.00
RxUSA.com	$9.95	n/a
VitalRx.com	n/a	$36.03
WebRx.com	$9.87	$37.87

[4] Case Mix Adjustment: Per diem payments for each admission are case-mix adjusted using a resident classification system (Resource Utilization Groups III) based on data from resident assessments (MDS 2.0) and relative weights developed from staff time data.

Geographic Adjustment: The labor portion of the federal rates is adjusted for geographic variation in wages using the hospital wage index.

[5] The following table illustrates some average cost and average number of visits data for 2001:

Home Health Discipline Type	Average Cost/Visit	Average Number	Home Health Rate
Home Health Aide Services	$41.75	13.4	$559.45
Medical Social Services	$153.59	.32	$49.15
Occupational Therapy	$104.76	.53	$55.52
Physical Therapy	$104.05	3.05	$317.35
Skilled Nursing	$94.96	14.08	$1,337.04
Speech Pathology	$113.26	.18	$20.39
Total Non-Standardized			$2,338.90
Average per Episode			$43.54
Total Non-Standardized per 60-Day (+ supplies)			$2,416.01

[6] Medicare pays for hospice care on the basis of a set rate for each day of a beneficiary's election of hospice. There are four different levels of payment that may be made, depending on the type of care being provided on given day:

Routine home care day	$106.93
Continuous home care day	$624.13
Inpatient respite care day, each period is limited to five days	$110.62
General inpatient care	$475.69

The vast majority of hospice care days are paid at the routine home care rate. (All rates are subject to geographic adjustment.) "Inpatient care limitation," the total number of inpatient days used by Medicare patients of a hospice in the aggregate may not exceed 20 percent of the total number of hospice days billed by a certified hospice in a given year.

[7] Emanuel EJ, Fairclough DL, Slutsman J, Alpert H, Baldwin D and Emanuel LL. "Assistance from family members, friends, paid care givers, and volunteers in the care of terminally ill patients." *New England Journal of Medicine*, 341(13): 956-963, 1999.

Emanuel EJ, Fairclough DL, Slutsman J and Emanuel LL. "Understanding economic and other burdens of terminal illness: the experience of patients and their caregivers." *Annals of Internal Medicine*, 132(6): 451-459, 2000.

In a series of studies by Emanuel and colleagues of incurably ill patients and their families, 34.7% had substantial care needs. Patients who had substantial care needs were more likely to report that they had a subjective sense of economic burden (44.9% compared with 35.3%); that 10% of their household income was spent on health care (28.0% compared with 17.0%); and that they or their families had to take out a loan or mortgage, spend their savings or obtain an additional job (16.3% compared with 10.2%).