Evaluating Baseline Opportunities, Program Reach, and Further Opportunities

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Introduction and rationale. Inpatient palliative care (IPPC) programs focus generally on patients who have advanced serious illnesses, and more specifically will seek out patients with unresolved symptoms, unclear goals of care, end-of-life needs, and where there is uncertainty or disagreement about care plans. You can use hospital data to understand which previously hospitalized patients might have been PC-relevant (that is, likely to have had needs an IPPC service could have helped with). Such patients usually compose a small percentage of hospital admissions per year, and typically have longer lengths of stay (LOS) and higher costs than other hospitalized patients.

The methods and examples provided here can help you to conduct and interpret such analyses for your hospital. The general concept is to use retrospective data to find and describe hospitalized patients who were at risk for needs that an IPPC service could have addressed.

Completed example. Before going through the specific steps of this analysis, it may help to see what a completed example looks like, and how to interpret the findings. Table 1 and the description that follows provide an example from Virginia Commonwealth University (VCU) Health System, a safety-net and Level I trauma center hospital in Richmond, Virginia.

Table 1. Example of Inpatient Analysis of Palliative Care Risk/Relevance

	Deaths	High-risk survivors	All other admits	Total
Cases	812	1,964	24,584	27,360
% of cases	3%	7%	90%	100%
DRG weight / case-mix index	4.03	4.12	1.53	1.79
% ICU days	20%	44%	36%	100%
% total days	6%	20%	75%	100%
Avg LOS	11.9	16.8	5.1	6.2
Direct costs / day	$3,064	$2,220	$1,683	$1,867
Direct costs / case	$36,335	$37,348	$8,628	$11,512
Direct costs / case (ratio)	4.2x	4.3x	1.0	
% cases with Medicare	49%	52%	30%	33%
PC consulted or on PC Unit	315	313	523	1,151
% with PC within stratum	39%	16%	2%	4%
Distribution of PC	27%	27%	45%	100%

Source: Author analysis of data from Virginia Commonwealth University Health System, 2021.
Notes: *DRG* is diagnosis-related group; *LOS* is length of stay; *ICU* is intensive care unit; *PC* is palliative care.

This example indicates:

- A small portion of cases (10%) are in the first two categories most at risk / relevant.

- Their acuity is reflected in higher case-mix index scores compared to the other 90% of cases.
- These 10% of cases account for 64% of ICU days and 26% of total bed days.
- Their average LOS is two to three times higher than other cases.
- Their direct costs per case are more than four times higher than other cases.
- The PC team was involved in 39% of high-risk, 16% of medium-risk, and 2% of low-risk cases.

The critical conclusions for stakeholders include:

- PC-relevant cases compose a small portion of hospital cases per year.
- The PC-relevant hospital stays have higher acuity, are longer, and are more costly on average than other hospitalizations.
- These longer lengths of stay and higher costs need to be taken into consideration when evaluating the impact of PC involvement: Merely comparing PC cases to all others is invalid, given how different PC-relevant cases are compared to most hospitalizations.

If no IPPC service exists, the PC team can use these data to highlight opportunities. If an IPPC service exists, the PC team can use these data to see how they could be involved in a higher percentage of the relevant cases.

Methods. In Table 1, the rows present the information of interest: number and percentage of cases, acuity, LOS and percentage of bed days, average cost and difference in cost, portion with PC involvement (where applicable), etc. The table columns present the three categories of PC-risk/relevance and the grand total.

Conduct the analysis on the most recent, complete fiscal year. Focus on adults only, or conduct separate analyses for adult and pediatric cases.

The following section includes detailed steps for conducting such an analysis, and you also have the flexibility to use different criteria as needed or preferred.

Criteria:

- **High-risk/relevance.** All the patients who died in the hospital.
- **Medium-risk/relevance.** Patients discharged from the hospital to hospice, or other survivors whose Medicare Severity Diagnosis Related Group (MS-DRG) (or All Patients Refined Diagnosis Related Group [APR-DRG] or similar) are associated with high mortality.
- **Low-risk/relevance.** All other patients discharged alive.

The **high-risk/relevance group** includes patients who died in the hospital (e.g., disposition at discharge from the acute stay is 20, “Expired”). In most US hospitals this is 2%–3% of cases per year.

The **medium-risk/relevance group** comprises two distinct groups: hospice discharges and other survivors of high-mortality DRGs. The first group is straightforward: Identify people who were discharged alive to hospice (e.g., discharge code 50, “Home hospice” or 51, “Facility hospice”). Identifying the second group, high-risk survivors, is a bit more complicated and there are several ways to achieve it, as follows:

- If APR-DRGs are available in your hospital data, the “risk of mortality” (ROM) subscore can be used; select cases discharged alive with the “extreme” ROM score (as opposed to “minor,” “moderate,” or “major”).

- If APR-DRGs are not available in your hospital data, determine which MS-DRGs are associated with the highest mortality rate for your hospital. Ask analysts to produce a table of all discharges in a given year (regardless of disposition at discharge) and to provide columns for the percentage that died (disposition code 20) versus all other dispositions combined. Sort this in descending order by the percentage that died to find the MS-DRGs with highest mortality rate. The list should have a format similar to the example in Table 2.

Table 2. Mock Data on Survivors of High-Mortality Diagnosis Related Groups (Illustrative Only — Do Not Use List)

MS-DRG	Type	MS-DRG Title	Total Cases	Expired	All Other Dispositions*	Mortality Rate
283	MED	ACUTE MYOCARDIAL INFARCTION, EXPIRED WITH MCC	90	90	0	100%
003	SURG	ECMO OR TRACHEOSTOMY WITH MV >96 HOURS OR PRINCIPAL DIAGNOSIS EXCEPT FACE, MOUTH AND NECK WITH MAJOR O.R. PROCEDURES	90	25	65	28%
870	MED	SEPTICEMIA OR SEVERE SEPSIS WITH MV >96 HOURS	90	25	65	28%
207	MED	RESPIRATORY SYSTEM DIAGNOSIS WITH VENTILATOR SUPPORT >96 HOURS	90	15	75	17%
955	SURG	CRANIOTOMY FOR MULTIPLE SIGNIFICANT TRAUMA	90	15	75	17%
235	SURG	CORONARY BYPASS WITHOUT CARDIAC CATHETERIZATION WITH MCC	90	10	80	11%
834	MED	ACUTE LEUKEMIA WITHOUT MAJOR O.R. PROCEDURES WITH MCC	90	10	80	11%
461	SURG	BILATERAL OR MULTIPLE MAJOR JOINT PROCEDURES OF LOWER EXTREMITY WITH MCC	90	5	85	6%

* Cases that might be included in the medium-risk category.
Source: Developed by authors.

The mortality rate of MS-DRG 283 is always 100% because of its definition. In the fictitious example above, the 8 rows shown total to 525 survivors, all of which might be included in the medium-risk category (only survivors are added to the medium-risk category for your analysis). You can decide on a cutoff point such as the top 25 rows, or mortality rate >"x"%, or until the medium-risk group has 8% of all hospitalizations in it, or similar. There is no predetermined cutoff point, but in general the PC-

relevant categories (high-risk plus medium-risk) should represent approximately 10% of the total hospitalizations for this exercise.

Finally, the **low-risk/relevance group** is all cases that did not meet criteria for the other two risk groups.

Interpretation. You should highlight the findings useful for various audiences (see bullet points under Table 1) and describe the implications for a PC program. Keep in mind that this is not the method you would use for prospective case finding. This is only a tool for a retrospective high-level analysis of where PC-relevant cases fall in the larger context of all hospitalizations.

Other classification options. The approach described above used mortality, risk of mortality, and hospice discharges as the basis for this retrospective analysis. But other classification options can be used instead:

- You could lump decedents and hospice discharges together into the first category.
- You could use an approach other than risk of mortality for a second group. This could be based on a comorbidity index such as the Charlson or the Elixhauser. Or include the oldest-old patients (age 80 and over, for example) regardless of clinical or coding criteria.

Additional potential analyses. Once you are comfortable asking for and interpreting these kinds of analyses to understand patient populations, you could explore other analyses as well. Table 3 provides another example from VCU; this example drills down to insurance type and includes revenue and margin.

Table 3. Example of Analysis of Net Margin

	Medicare deaths	Medicare high-risk survivors	All other Medicare admits	Total Medicare
Medicare Cases	396	1,030	7,469	8,895
% Medicare cases	4%	12%	84%	100%
Total costs / case	$52,948	$49,109	$15,413	$20,986
Reimbursed / case	$48,347	$44,256	$15,440	$20,242
Net Margin (sum)	**$ - 1,822,204**	**$ - 4,998,219**	$197,960	**$ - 6,622,463**

Source: Author analysis of data from Virginia Commonwealth University Health System, 2021.
Notes: Data include Medicare fee-for-service. *Net margin* is total revenue less total costs.

In this example, the hospital's reimbursement from Medicare for the year for these patients did not cover costs — there was a $6.6 million "loss" for those cases. When looking at this through the lens of the PC-relevant categories analysis, it is apparent that the net loss is driven by the high- and medium-risk/relevance groups. Another point from this table is that the reimbursement per case is three times higher for the PC-relevant cases but is insufficient to keep up with the costs, which are greater still. Demonstrating that PC-relevant cases often generate net losses can help make the case for creating or expanding an IPPC program, given the abundant evidence that IPPC typically reduces costs.

Drilling down to the level of a specific DRG, as shown in Table 4, is useful because it demonstrates the effects of Medicare's inpatient payment system, which pays the same amount for a given DRG regardless of the cost of each actual case. The reimbursement for that DRG for VCU that year was $14,358. This was more than adequate to cover the total costs of care for the 12 patients who did not die. But the decedents' hospitalizations had more than twice the LOS and cost. Again, the insufficiency of revenue related to cost among the PC-relevant cases helps make the case for IPPC.

Table 4. Example of Analysis of a Specific Diagnosis Related Group (180, "Respiratory Neoplasms with Major Complications/Comorbidities")

	Expired	High-risk survivors	Other survivors	Total
# cases	2	8	4	14
Avg LOS (days)	13.5	5.3	5.0	6.4
Avg total cost	$ 22,041	$ 10,727	$ 10,579	$ 12,301
Avg reimbursed	$ 14,358	$ 14,358	$ 14,358	$ 14,358
Avg net margin	**$ (7,683)**	$ 3,631	$ 3,779	$ 2,057

Source: Author analysis of data from Virginia Commonwealth University Health System, 2011.
Notes: Data include Medicare fee-for-service only. *LOS* is length of stay.

Summary

Palliative care–relevant cases aren't quite "needles in the haystack" of hospitalizations, but they are a small portion with unusually high costs and lengths of stay. Because palliative care has been demonstrated to reduce LOS and costs significantly, this classification analysis can help evaluate baseline or further opportunities for PC programs to reach relevant patients while highlighting costs and resource utilization. This may be especially important in safety-net hospitals where revenue is almost entirely limited to governmental insurance (Medi-Cal, Medicare, TRICARE, etc.)