

**VA Hospice and Palliative Care: Preliminary Identification of  
Indicators to Identify Veterans at Substantial Risk for Specialized  
End-of-Life Care**

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# VA HOSPICE AND PALLIATIVE CARE: PRELIMINARY IDENTIFICATION OF INDICATORS TO IDENTIFY VETERANS AT SUBSTANTIAL RISK FOR SPECIALIZED END-OF-LIFE CARE

## EXECUTIVE SUMMARY

In the fall of 2006, VA HSR&D funded a rapid response project (RRP) to support the national director of VA Hospice & Palliative Care (HPC) in exploring criteria for a method to systematically identify patients who might benefit from hospice and palliative care. The objectives of the project were:

- (1) to work with an expert panel to identify diagnoses and/or events in inpatient, outpatient and long term care settings that could indicate a referral to the hospice and palliative care team;
- (2) to create computer algorithms for the indicators using data elements available in the various national VA databases;
- (3) to determine the prevalence of the indicators by applying them to various national VA databases; and
- (4) to test the final indicators agreed on by the expert panel by merging patients identified with the indicators with mortality data to see how predictive the indicators are.

This report summarizes the work of the expert panel and Health Care Financing and Economics (HCFE) researchers. It includes sections on the expert panel and on the specifications developed by the panel. It presents an analysis of median predicted months survival for patients in each of the categories identified by the expert panel. Based upon the analysis, a preliminary case finding metric is suggested. Finally, a section summarizing some of the more salient points and outlining next steps is included.

*Key points in this report are as follows:*

1. A series of discussions occurring over several months among expert panel members led to a focus on the following criteria as particularly important in selecting components of the case finding metric.
  - a. *“Low-hanging fruit.”* There was a general consensus that there would be a higher probability that VA staff would accept and successfully implement a case finding metric if the panel focused on conditions that specialists in all disciplines could agree were indicators of high mortality risk. To quantify the concept of low-hanging fruit, panel members agreed that if a condition resulted in a predicted probability of 50% or more of patients in a particular category dying within a year, then that condition should be considered for inclusion in the case finding metric. The survival analysis conducted by the research team generated statistics that determined the median predicted months survived for patients in various subcategories. To choose conditions for inclusion in the case metric we used a cut off threshold of median survival time equal to or less than 12 predicted months. This closely approximates the concept of a predicted probability of 50% or more of dying within a year.

b. *Multifaceted approach.* Panel members agreed that making recommendations across services and settings instead of a focusing solely on one bedsection or diagnosis would allow each medical facility to implement the recommendations in a way most consistent with its culture. Additionally, expert panel members agreed that recommendations should be broad enough to include both patients very close to death who might benefit from one or two days of services as well as patients who may have months to a year to live and who would benefit from a longer period of HPC services.

c. *ICU events and conditions.* A separate analysis of ICU data by the director of the VA Inpatient Evaluation Center (IPEC) resulted in the recommendation that the following two ICU related events/conditions be included in the case finding metric: (1) patients with a length of stay in the ICU of 10 days or more, and (2) ICU patients for whom cancer is the primary diagnosis. Patients who are admitted to the ICU for either of these two reasons tend to have one year mortality rates greater than 50%.

d. *Chronic Conditions.* No chronic condition meets the criteria of median predicted months of survival of 12 months or less. However, it was important to the expert panel to include chronic conditions in the case finding metric. As an initial step, patients with 2 hospitalizations for either CHF or COPD within a year are included in the case finding metric. Thirty percent of these patients identified in FY2005 died within 12 months. Further research to identify more precisely which patients are at higher risk of dying is necessary.

2. Based on a consensus approach, expert panel members developed a list of specifications for further exploration (Appendix B). Using a survival analysis model, predicted median months of survival was estimated using 5 years of data (FY2001-2005) for each category of patients.

3. Using a cut off threshold of median survival time equal to or less than 12 predicted months (which approximates the concept of a predicted probability of 50% or more of dying within a year) the following conditions met the criteria for inclusion in the case finding metric.

#### Conditions for inclusion in the case finding metric

Condition/Disease	Identifying ICD-9 code(s) or other specification	Indication of advanced disease (ICD-9 codes*)	Inpatient w/indication of advanced disease (Age)	Inpatient without indication of advanced disease (Age)	Outpatient w/indication of advanced disease (Age)	Outpatient without indication of advanced disease (Age)
<i>Cancers</i>						
Head, neck	141-148	196,197, 0r 198	61+	81+		
Trachea, Bronchus, and Lung	162	197 or 198	All ages	61+	71+	
Prostate	185	197 or 198	71+			
Colon	153	197 or 198	51+		>85	
Liver	155	196, 197 or 198	All ages	All ages	71+	

Pancreatic	157	196, 197 or 198	All ages	51+	71+	
Esophageal	150	196, 197 or 198	All ages	51+	76+	
Lymphomas	200-202	197 or 198	61+	>85	>85	
Leukemias	204.0, 205.0, 206.0, 207.2, 207.8, 208.0			61+		
Melanoma	172	196, 197 or 198	51+		81+	
CNS	191			61+		
All other cancers	Remaining cancer ICD_9 codes (140-239)	197 or 198	51+	81+	>85	
<i>Other Conditions</i>						
AIDS/HIV	42	For indication of advanced disease, see note 1	76+			
CHF	428	For indication of advanced disease, see note 2	All ages			
COPD	490-492, 493.3, 494-496	For indication of advanced disease, see note 3	All ages			
Cirrhosis/with paracentesis	(571 or 572.3) with 54.91			>85		
Anoxic encephalopathy	348			81+		
ICU stay	Medical ICU stay	LOS >= 10 days;	All ages			
ICU stay	Medical ICU stay	Cancer Dx	All ages			

\* ICD-9 196 = Secondary and unspecified malignant neoplasm of lymph nodes; ICD-9 197 = Secondary malignant neoplasm of respiratory and digestive systems; ICD-9 198 = Secondary malignant neoplasm of other specified sites for example (kidney, brain, skin, bone...)

(1) AIDS/HIV - 042 with at least one the following secondary diagnoses: hepatoma (155), cirrhosis (571.2, 571.5), lymphoma (200), cachexia (799.4), other cancer (140-172, 174-208); (2) CHF - Patients with 2 hospitalizations within 6 months, each with a primary diagnosis of CHF; (3) COPD - Patients with 2 hospitalizations within 6 months, each with a primary diagnosis of COPD.

4. Next steps might include further analysis of patients with CHF and COPD, exploring functional status as a predictor of mortality, and looking more carefully at nursing home patients with specific diagnoses such as Alzheimer's disease as well as those with admissions either to acute care from the nursing home or from acute care to the nursing home. An additional area of exploration would be to evaluate which implementation option would be most effective in achieving the goal of improving access to hospice and palliative care services for VA patients.

# **VA HOSPICE AND PALLIATIVE CARE: PRELIMINARY IDENTIFICATION OF INDICATORS TO IDENTIFY VETERANS AT SUBSTANTIAL RISK FOR SPECIALIZED END-OF-LIFE CARE**

## **Part I: Introduction**

In June 2004, VA appointed its first director of Hospice and Palliative Care (HPC) as part of its efforts to strengthen the provision of hospice and palliative care within VA. Initiatives have included development of inpatient hospice and palliative care units within each facility, educating inpatient staff in providing quality end-of-life care, and collaboration with community hospice agencies through the national hospice-veteran partnership program. In FY2005, 29 states had active hospice-veteran partnership programs. Additionally, for several years VA has sponsored Palliative Care Fellowships in medical centers throughout the nation. Research is also underway to validate an outcome measure that assesses after-death family member satisfaction. Results from this survey will be incorporated into the VA quality assurance process. FY2006 strategic initiatives for the hospice and palliative care program include: (1) improving access to hospice and palliative care in both inpatient and outpatient settings, 2) promoting quality improvement through program development and outcome measurement and 3) enhancing staff expertise in the delivery of care at the end of life. The action plan for improving access to hospice and palliative care in inpatient and outpatient settings includes the exploration of automated case finding techniques. This specific task was articulated because a FY2005 survey found that of 81% of facilities had no automated case finding method to identify veterans appropriate for HPC (FY2005 Status Report).

In the fall of 2006, VA Health Services Research and Development (HSR&D) funded a rapid response project (RRP) for staff of Health Care Economics and Financing (HCFE) to support the national director of VA Hospice & Palliative Care in exploring criteria to systematically identify patients who might benefit from hospice and palliative care. The objectives of the project were:

- (1) to work with an expert panel to identify diagnoses and/or events in inpatient, outpatient and long term care settings that could indicate veterans at risk for needing specialized end-of-life care services;
- (2) to create computer algorithms for these indicators using data elements available in the various national VA databases;
- (3) to determine the prevalence of these indicators by applying them to various national VA databases; and
- (4) to test the final indicators agreed upon by the expert panel by merging patients identified by the indicators with mortality data to see how predictive the indicators are.

This report summarizes the work of the expert panel and HCFE researchers. It describes the work of the expert panel, the specifications developed by the panel and an analysis of median predicted months survival for patients in each of the categories identified by the panel. The analysis was the basis for recommending components for inclusion in a preliminary case-finding metric. The final section summarizes salient points and outlines next steps.

## *Expert Panel*

An expert panel (see Appendix A) comprised of the national director of Hospice and Palliative Care, two hospital administrators, three hospice and palliative care specialists, one ICU intensivist, and the national chief of Hematology/Oncology met via conference calls over six months to consider the development of a case finding metric to promote improved access to hospice and palliative care services. The panel agreed upon the following mission statement:

*“To develop a practical tool which identifies veterans at substantial risk for needing specialized end-of-life care, often including palliative care and/or hospice services.”*

The panel’s mission statement reflects considerable deliberation to accurately articulate the group’s purpose. The wording of the mission statement reflects a key concept agreed upon by the group: that hospice and palliative care should be seen as complementary to, not exclusionary of, other care. Too often, patients, administrators and physicians interpret hospice and palliative care as mutually exclusive of life prolonging or curative interventions. Many advisory panel discussions focused on this issue, with several members noting that within their facility it was a commonly held belief that hospice and palliative services could only be provided once the patient had made the decision to forgo life prolonging or curative interventions of any sort. HPC specialists on the panel provided the perspective that palliation could be provided to the patient in conjunction with the care provided by the patient’s primary or specialist physician. The HPC physicians could be helpful in discussing goals of care, providing expertise in symptom management and facilitating attention to a patient’s emotional and spiritual wellbeing. A second key concept captured by the mission statement is that quality care can be provided not only by hospice and palliative care clinicians but also by primary care and specialist clinicians.

Members generally agreed that while mortality may be predicted for a population as a whole it is very difficult to predict mortality for a particular individual. Given this, it was important to the expert panel and for the success of the metric that conditions chosen for inclusion in the metric have a high likelihood of acceptance by specialists in all disciplines. This agreement led the panel to focus on the concept of “low-hanging fruit,” by which it meant a population of patients with a predicted probability of 50% or more of dying within a year.

It was important to the panel that VA HPC adopt a multifaceted approach. Members agreed that making recommendations across services and settings instead of focusing solely on patients in one bed section or with a specific diagnosis would provide maximum flexibility to medical centers in implementing a metric across facilities. The panel also agreed that the metric should be broad enough to include both veterans close to death who might benefit from a few days of services and veterans who may have months to a year to live and who would benefit from a longer period of specialized services.

The expert panel noted that, given constant advances in medical treatment, a dynamic process to modify and revise the selected criteria needs to be in place. New diagnostic methods, treatments, techniques, and medical devices may transform what was once a condition certain to result in death into a chronic condition. A metric developed in 2007 needs to be reviewed every year.

## Specifications

The expert panel initially generated a list of possible indicators to consider for inclusion in the case finding metric. To facilitate this task, HCFE researchers reviewed published literature, current and past efforts by national organizations of hospice and palliative care, and specific efforts by VA researchers and administrators. Among the more influential documents were the National Hospice Organization 1996 Medical Guidelines Determining Prognosis in Selected Non-Cancer Diseases, (NHO 1996), the Palliative Care Index - a VA-developed list of indicators for hospice and palliative care (Appendix C), a document titled “List of Criteria of Palliative Care Referrals by National Consensus Project Domains” (Appendix D), General Referral Criteria developed by David Weissman (Appendix E), and a list of advanced disease criteria used in a HSR&D-funded grant to study hospice and palliative care issues in VISN 3 (Joan Penrod, PI, Appendix F).

The expert panel reviewed the resulting preliminary list of specifications. Members drew from their own backgrounds as oncologists, HPC specialists and ICU intensivists to amend and refine the list. The final conditions included in the specifications were agreed upon by the expert panel through a consensus process. Criteria from *A Practical Tool to Identify Patients Who May Benefit from a Palliative Approach: The Caring Criteria* (Fischer 2006) were added to the initial specifications. Panel members also asked to have indicators on functional status, nursing home patients with acute care admissions, patients with multiple transfers, and patients with cirrhosis added. By the end of the process, most of the specifications fell into one of four fairly well-defined categories: cancers, chronic conditions, ICU related events and conditions, and nursing home related events and conditions.

For certain conditions, the panel recommended limiting the population to those patients who were most seriously ill. A variety of indications of advanced disease were suggested for limiting the populations, among them metastatic disease (as indicated by some combination of ICD-9 codes 196, 197 or 198)<sup>1</sup>, certain chemotherapy drugs, and age. For chronic conditions such as COPD and CHF, the suggestion was that two hospitalizations within 6 months for the specific condition would reflect more serious disease.

A major restriction and challenge for this project was that the case finding metric needed to be one that could be applied on a nationwide basis. This requirement limited analysis to those specifications that could be identified in the VA national datasets. In most instances, conditions that were identifiable using ICD-9 codes were included in the analysis. Because of time constraints, analyses of specifications that would have required merging VA administrative datasets with other sets of data (such as MDS for nursing home patients) were deferred. Also, analyses of specifications for which data was available only at select medical facilities (such as functional status) were also deferred.

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<sup>1</sup> ICD-9 196 = Secondary and unspecified malignant neoplasm of lymph nodes;  
ICD-9 197 = Secondary malignant neoplasm of respiratory and digestive systems;  
ICD-9 198 = Secondary malignant neoplasm of other specified sites for example (kidney, brain, skin, bone...)

## ICUs

The exception to this use of the national databases was the analysis of ICU specifications. While data on ICUs is included in the administrative datasets, Dr. Marta Render, director of the VA Inpatient Evaluation Center (IPEC) and an expert on VA ICUs, advised that the designation of ICUs in the national databases is not always valid and that the data obtained directly from individual VA medical centers would result in a more accurate analysis. She therefore separately analyzed ICU data and recommended to the expert panel ICU related events and conditions for inclusion in the metric.

The final specifications to be explored are listed below in Exhibit 1. For a complete list of all specifications initially considered please see Appendix B.

### EXHIBIT 1: SPECIFICATIONS FOR CASE FINDING METRIC

Condition/Disease	Identifying ICD-9 codes	Chemotherapy drugs as indicative of advanced disease <sup>a</sup>	Other indications of advanced disease
Head, neck	141-148		Any secondary diagnosis code of 196, 197, 198
Trachea, Bronchus, and Lung	162		197, 198
Prostate	185	Docetaxel or Mitoxantrone or Paclitaxel or Calcitriol or Estramustine	197 or 198
Colon	153		197,198
Liver	155		196 or 197 or 198
Pancreatic	157		196 or 197 or 198
Esophageal	150		196 or 197 or 198
Lymphomas	200-202	Cisplatin (Large cell lymphoma)	197 or 198
Leukemias	204.0, 205.0, 206.0, 207.2, 207.8, 208.0	For patients age 70+	
Melanoma	172		196, 197 or 198
CNS	191		
All other cancers	Remaining cancer ICD-9 codes (140-239)		197 or 198
AIDS/HIV	42		042 with at least one the following secondary diagnoses: hepatoma (155), cirrhosis (571.2, 571.5), lymphoma (200), cachexia (799.4) or other cancer (140-172, 174-208); with any cancer w/197 or 198
CHF	428		Patients identified with a dx of CHF in inpatient or outpatient files with 2 hospitalizations within 6 months with principal dx for each hospitalization of CHF
COPD	490-492, 493.3, 494-496		Patients identified with a dx of COPD in inpatient or outpatient files with 2 hospitalizations within 6 months with principal dx for each hospitalization of COPD
Cirrhosis/with paracentesis***	(571 or 572.3) with 54.91		
Anoxic encephalopathy	ICD-9 348		
ICU related analyses	LOS >= 10 days		
ICU related analyses	Cancer dx		

<sup>a</sup> Data on chemotherapy drugs was obtained from the Decision Support System pharmacy files available from the Austin Automation Center in Austin, Texas.

## Part II: Analysis - Methods

HCFE research staff conducted a survival analysis that predicted the number of months of survival within each group of patients in the above table using diagnosis, age, gender and indication of advanced disease as predictive variables. The analysis used five years of data from FY 2001 through FY 2005 to identify patients who had one of the specified conditions. The index date for the survival analysis was the date of the first diagnosis for each patient after at least one year in which there was no inpatient or outpatient record of that diagnosis for the patient. This approach proxied the first time they were cared for in the VA system for any of the specified conditions. Because the Vital Status Files provide dates of death only through April 1, 2006, many patients are listed as alive as of the end point of the study. Therefore the statistical model, which used the SAS computer program LIFEREG, took into account this censoring of data (i.e., having no mortality data after a given date) in computing predicted months of life in estimating survival.

Patients were assigned to the “inpatient” category if the first appearance of a selected diagnosis during the study years was in a VA inpatient record, otherwise they were classified as “outpatient”. Patients were also classified by whether or not they had indications of advanced disease. For cancers, indications of advanced disease included whether or not a patient had a diagnosis for metastatic disease (ICD-9 codes of 196, 197 or 198) associated with the primary cancer. For chronic conditions there were a variety of ways of determining advanced disease (see Exhibit 1, columns 3 and 4). This classification scheme resulted in four major categories of analysis for each condition: (1) inpatients with indication of advanced disease, (2) inpatients without indication of advanced disease, (3) outpatients with indication of advanced disease and (4) outpatients without indication of advanced disease. Age in the survival models was divided into 7 groups:  $\leq 50$ , 51-60, 61-70, 71-75, 76-80, 81-85 and  $>85$ .

A limitation of this analysis is that the location of the patient at the time of death cannot necessarily be determined from the available information. Patients may have died inpatient in VA, at home or in a community facility of some type (nursing home or hospital). A second limitation is that for patients identified as being VA inpatients, we did not distinguish between acute care and long-term care (LTC) inpatients. The proportion of cancer inpatients who were in "LTC settings only" ranged from 8.7% for acute leukemias to 30.8% for prostate cancer. For most of the other cancers, the proportions of inpatients in "LTC settings only" were between 10% and 20%. For inpatients with CHF, the proportion was 8.6% and for those with COPD it was 33.1%. Future analyses to explore differences by these settings would be useful.

***Overview of population included in survival analysis***

Table 1 shows the conditions that were examined and the diagnostic codes used to select them as well as the total number of patients in the 5 years who met the inclusion criteria. To provide an annual perspective, the table includes a column with an average count per year, one fifth of the five year total. It is important to note that the “Total” figure at the bottom of the chart does not reflect unique individuals. Individuals may have more than one condition and so may be counted more than once in the total.

*Table 1: Total number (N) of patients in dataset for each condition, FY 2001-2005*

Condition/Disease	Identifying (ICD-9 Code)	N	N/5 (Average “N” per year)
<i>Cancers</i>			
Head, neck	141-148	27,490	5,498
Trachea, Bronchus, and Lung	162	98,340	19,668
Prostate	185	338,055	67,611
Colon	153	79,536	15,907
Liver	155	11,848	2,370
Pancreatic	157	10,192	2,038
Esophageal	150	12,576	2,515
Lymphomas	200-202	37,712	7,542
Acute Leukemias	204.0, 205.0, 206.0, 207.2, 207.8, 208.0	5,912	1,182
Melanoma	172	37,500	7,500
CNS	191	9,311	1,862
All other cancers	Remaining cancer ICD_9 codes (140-239)	1,204,537	240,907
<i>Other Conditions</i>			
AIDS/HIV	42	22,274	4,455
CHF	428	169,142	33,828
COPD	490-492, 493.3, 494-496	967,732	193,546
Cirrhosis/with paracentesis	(571 or 572.3) with 54.91	104,986	20,997
Anoxic encephalopathy	348	25,630	5,126
<b>TOTAL</b>		<b>3,162,773</b>	<b>632,552</b>

\*See Endnote 1

***Predicted months survival time (from index date), by diagnostic group and age***

Table 2 shows the median number of months that the patients in each diagnostic group were predicted to survive, controlling for age and gender. For each condition, the median is delineated for four groups: inpatients with and without indication of advanced disease and outpatients with and without indication of advanced disease. The medians are usually greater than 12, indicating that the majority of patients will survive longer than a year. Shaded cells identify the conditions for which the median rounds to 12 months or less. A negative number is an idiosyncrasy of the model and should be interpreted as a prediction that at least half the patients would survive less than one month.

***Table 2: Median predicted months of survival (from index date), by inpatient and outpatient, with and without indication of advanced disease***

Condition/Disease	Indication of advanced disease (ICD-9 codes)	Inpatient		Outpatient	
		With indication of advanced disease Median # months (# of observations)	Without indication of advanced disease Median # months (# of observations)	With indication of advanced disease Median # months (# of observations)	Without Indication of advanced disease Median # months (# observations)
<b><i>Cancers</i></b>					
Head, neck	196,197, or 198	<b>12.5</b> (138)	<b>23.3</b> (2,063)	<b>36.5</b> (1,806)	<b>48.2</b> (23,483)
Trachea, Bronchus, and Lung	197 or 198	<b>-2.6</b> (964)	<b>9.3</b> (19,271)	<b>12.5</b> (4,467)	<b>25.2</b> (73,638)
Prostate	197 or 198	<b>1.3</b> (138)	<b>29.2</b> (8,434)	<b>28.0</b> (3,404)	<b>57.2</b> (326,079)
Colon	197 or 198	<b>2.8</b> (195)	<b>29.6</b> (6,535)	<b>20.8</b> (2,003)	<b>49.3</b> (70,803)
Liver	196,197, or 198	<b>-2.1</b> (69)	<b>5.5</b> (3,196)	<b>12.1</b> (959)	<b>20.0</b> (7,624)
Pancreatic	196,197, or 198	<b>-6.4</b> (96)	<b>4.6</b> (2,711)	<b>12.1</b> (547)	<b>24.0</b> (6,838)
Esophageal	196,197, or 198	<b>-5.5</b> (60)	<b>8.1</b> (1,861)	<b>15.5</b> (610)	<b>28.8</b> (10,045)
Lymphomas	197 or 198	<b>0.0</b> (31)	<b>25.3</b> (3,617)	<b>28.9</b> (453)	<b>49.1</b> (33,611)
Leukemias			<b>6.2</b> (1,555)		<b>39.7</b> (4,357)
Melanoma	196,197, or 198	<b>3.6</b> (25)	<b>30.2</b> (589)	<b>25.2</b> (687)	<b>62.6</b> (36,199)
CNS			<b>9.0</b> (1,631)		<b>33.6</b> (7,680)
All other cancers	197 or 198	<b>-3.9</b> (2,843)	<b>27.9</b> (62,951)	<b>26.8</b> (21,137)	<b>67.0</b> (1,117,606)
<b><i>Other Conditions</i></b>					
AIDS/HIV	See note 1	<b>30.7</b> (74)	<b>45.7</b> (1,709)	<b>55.5</b> (1,445)	<b>73.6</b> (19,046)
CHF	See note 2		<b>29.6*</b> (169,142)		
COPD	See note 3		<b>40.5*</b> (92,893)		<b>58.6</b> (874,839)
Cirrhosis/with paracentesis			<b>39.6</b> (27,669)		<b>58.1</b> (77,317)
Anoxic encephalopathy			<b>24.3</b> (9,276)		<b>57.5</b> (16,354)

(1) AIDS/HIV - 042 with at least one the following secondary diagnoses: hepatoma (155), cirrhosis (571.2, 571.5), lymphoma (200), cachexia (799.4), other cancer (140-172, 174-208); (2) CHF - Patients with 2 hospitalizations within 6 months, each with a primary dx of CHF; (3) COPD - Patients with 2 hospitalizations within 6 months, each with a primary dx of COPD.

\*Includes patients with two stays within 6 months.

Table 3 presents the median number of predicted months of survival by age for each of the specified conditions without taking into account whether the diagnosis was first made in an inpatient or outpatient setting. Age is divided into 7 groups: <=50, 51-60, 61-70, 71-75, 76-80, 81-85 and >85. This survival analysis combined inpatients and outpatients for each diagnosis as well as those with and without indications of advanced disease. No subcategory meets the threshold of a median number of predicted months survived of 12 or less. The only one that comes close is liver cancer for patients over age 85. While age has a clear effect, age alone is not sufficient to identify patients at high risk of death within 12 months. We present this summary data, however, so that the reader can see the impact of the other predictors in the model detailed more thoroughly in tables 4 through 7.

*Table 3: Median predicted months of survival (from index date), by age*

	<=50	51-60	61-70	71-75	76-80	81-85	>85
Condition/Disease	Median (Number)	Median (Number)					
<i>Cancers</i>							
Head, neck	<b>58.7</b> (2,498)	<b>52.5</b> (8,462)	<b>47.0</b> (7,506)	<b>42.7</b> (3,690)	<b>39.6</b> (3,087)	<b>36.6</b> (1,724)	<b>33.5</b> (522)
Trachea, Bronchus, and Lung	<b>34.0</b> (3,279)	<b>30.4</b> (17,075)	<b>26.4</b> (26,374)	<b>24.0</b> (19,137)	<b>22.0</b> (19,356)	<b>20.4</b> (10,442)	<b>18.4</b> (2,676)
Prostate	<b>90.8</b> (3,270)	<b>79.6</b> (30,588)	<b>67.1</b> (73,289)	<b>59.7</b> (71,934)	<b>53.4</b> (83,564)	<b>47.2</b> (57,194)	<b>41.0</b> (18,207)
Colon	<b>65.3</b> (2,183)	<b>59.4</b> (10,482)	<b>53.5</b> (17,346)	<b>49.9</b> (14,819)	<b>46.9</b> (17,720)	<b>44.0</b> (12,771)	<b>41.0</b> (4,213)
Liver	<b>24.9</b> (1,019)	<b>22.4</b> (3,549)	<b>19.1</b> (2,821)	<b>17.5</b> (1,704)	<b>16.0</b> (1,613)	<b>14.5</b> (900)	<b>12.9</b> (242)
Pancreatic	<b>32.6</b> (481)	<b>28.7</b> (2,054)	<b>25.2</b> (2,522)	<b>22.9</b> (1,741)	<b>20.9</b> (1,874)	<b>19.0</b> (1,135)	<b>16.8</b> (384)
Esophageal	<b>35.2</b> (569)	<b>32.1</b> (2,829)	<b>29.4</b> (3,468)	<b>27.2</b> (2,231)	<b>26.0</b> (2,008)	<b>24.5</b> (1,167)	<b>23.2</b> (304)
Lymphomas	<b>70.3</b> (4,152)	<b>59.3</b> (8,242)	<b>50.8</b> (8,194)	<b>45.7</b> (5,749)	<b>41.5</b> (6,095)	<b>37.3</b> (4,081)	<b>33.0</b> (1,197)
Leukemias	<b>57.1</b> (612)	<b>48.0</b> (1,199)	<b>39.7</b> (1,399)	<b>35.2</b> (950)	<b>31.4</b> (989)	<b>28.3</b> (582)	<b>21.9</b> (180)
Melanoma	<b>86.1</b> (2,371)	<b>75.3</b> (7,278)	<b>66.2</b> (9,157)	<b>59.9</b> (6,215)	<b>55.4</b> (6,632)	<b>50.8</b> (4,402)	<b>47.2</b> (1,445)
CNS	<b>42.6</b> (1,465)	<b>35.8</b> (2,736)	<b>30.5</b> (2,236)	<b>27.3</b> (1,127)	<b>24.7</b> (1,048)	<b>22.0</b> (558)	<b>19.4</b> (140)
All other cancers	<b>91.5</b> (127,889)	<b>77.7</b> (302,411)	<b>67.0</b> (294,815)	<b>59.6</b> (172,312)	<b>54.3</b> (168,197)	<b>49.0</b> (106,266)	<b>43.6</b> (32,600)
<i>Other Conditions</i>							
AIDS/HIV	<b>78.8</b> (12,149)	<b>68.9</b> (7,302)	<b>61.1</b> (1,894)	<b>54.8</b> (495)	<b>50.1</b> (298)	<b>47.8</b> (105)	<b>42.3</b> (30)
CHF	<b>52.3</b> (6,316)	<b>44.4</b> (28,204)	<b>35.7</b> (36,245)	<b>29.6</b> (27,039)	<b>28.2</b> (32,744)	<b>20.9</b> (26,307)	<b>16.5</b> (12,286)
COPD	<b>86.1</b> (106,162)	<b>72.9</b> (226,256)	<b>61.0</b> (223,498)	<b>52.6</b> (142,787)	<b>46.6</b> (146,454)	<b>40.7</b> (93,133)	<b>34.7</b> (29,372)
Cirrhosis/with paracentesis	<b>65.8</b> (25,458)	<b>58.1</b> (44,794)	<b>47.6</b> (19,300)	<b>40.9</b> (7,221)	<b>36.1</b> (5,201)	<b>32.3</b> (2,405)	<b>26.5</b> (602)
Anoxic encephalopathy	<b>66.3</b> (5,327)	<b>57.5</b> (7,711)	<b>49.3</b> (4,751)	<b>44.9</b> (2,652)	<b>41.2</b> (2,790)	<b>38.3</b> (1,819)	<b>33.1</b> (580)

Tables 4 through 7 present each condition by inpatient and outpatient category, indication of advanced disease AND age. These results refine the analyses in Tables 2 and 3. For example, while Table 2 shows that all inpatients diagnosed with head and neck cancer who have an indication of advanced disease might have a median predicted survival of 12 months or less, Table 4 shows that only those patients who are 61 and older have such a short expected survival. Similarly, results in Table 3 might lead one to believe that age is inconsequential in assessing mortality risk. However, Tables 4, 5 and 6 show that once patients are separated by setting (in- or outpatient) and indication of advanced disease, age is a very important predictive factor.

*Table 4: Median predicted months of survival (from index date) by age – Inpatients with indication of advanced disease*

	<=50	51-60	61-70	71-75	76-80	81-85	>85
Condition/Disease	Median (Number)	Median (Number)	Median (Number)	Median (Number)	Median (Number)	Median (Number)	Median (Number)
<i>Cancers</i>							
Head, neck	<b>20.5</b> (14)	<b>15.9</b> (54)	<b>9.1</b> (45)	<b>6.1</b> (6)	<b>1.1</b> (14)	<b>-0.7</b> (3)	<b>-5.3</b> (2)
Trachea, Bronchus, and Lung	<b>4.3</b> (54)	<b>0.9</b> (267)	<b>-2.6</b> (307)	<b>-5.8</b> (153)	<b>-7.8</b> (121)	<b>-9.4</b> (50)	<b>-11.8</b> (12)
Prostate	<b>35.0</b> (2)	<b>25.0</b> (21)	<b>13.8</b> (20)	<b>5.1</b> (25)	<b>-2.4</b> (23)	<b>-6.2</b> (34)	<b>-13.7</b> (13)
Colon	<b>15.9</b> (13)	<b>8.8</b> (55)	<b>2.9</b> (44)	<b>-1.2</b> (26)	<b>-4.2</b> (34)	<b>6.8</b> (16)	<b>9.8</b> (6)
Liver	<b>2.5</b> (7)	<b>-0.3</b> (22)	<b>-2.1</b> (23)	<b>-4.9</b> (12)	<b>-6.7</b> (4)	<b>-7.6</b> (1)	
Pancreatic	<b>0.2</b> (6)	<b>-3.1</b> (33)	<b>-6.6</b> (22)	<b>-9.7</b> (13)	<b>-11.9</b> (10)	<b>-13.2</b> (9)	<b>-14.8</b> (3)
Esophageal	<b>0.9</b> (3)	<b>-2.4</b> (16)	<b>-5.3</b> (20)	<b>-7.9</b> (7)	<b>-9.3</b> (8)	<b>-11.0</b> (5)	<b>-12.5</b> (1)
Lymphomas	<b>17.0</b> (1)	<b>13.1</b> (6)	<b>3.4</b> (9)	<b>-2.5</b> (8)	<b>-5.9</b> (3)	<b>-11.0</b> (3)	<b>-16.1</b> (1)
Leukemias	NA	NA	NA	NA	NA	NA	NA
Melanoma	<b>21.7</b> (3)	<b>4.5</b> (13)	<b>-4.5</b> (2)	<b>-9.9</b> (2)	<b>-15.4</b> (4)	<b>-20.8</b> (1)	
CNS	NA	NA	NA	NA	NA	NA	NA
All other cancers	<b>16.3</b> (200)	<b>6.7</b> (794)	<b>-2.9</b> (748)	<b>-11.4</b> (389)	<b>-16.7</b> (390)	<b>-20.9</b> (229)	<b>-27.3</b> (92)
<i>Other Conditions</i>							
AIDS/HIV	<b>37.0</b> (35)	<b>28.4</b> (26)	<b>18.6</b> (6)	<b>13.5</b> (5)	<b>10.0</b> (2)	NA	NA
CHF*	<b>59.9</b>	<b>52.3</b>	<b>40.8</b>	<b>35.0</b>	<b>30.2</b>	<b>26.4</b>	<b>20.6</b>
COPD*	<b>69.6</b>	<b>61.6</b>	<b>50.6</b>	<b>44.7</b>	<b>39.7</b>	<b>35.7</b>	<b>29.7</b>
Cirrhosis/with paracentesis	NA	NA	NA	NA	NA	NA	NA
Anoxic encephalopathy	NA	NA	NA	NA	NA	NA	NA

\*Data based on FY00-02 data only; no "n's" available.

While inpatients with indication of advanced disease generally have very high risks of mortality within a few months, the numbers with metastatic disease when they are first diagnosed in VA on an inpatient basis are rather small (Table 4). Far greater numbers of patients are first diagnosed with the targeted conditions but not with advanced disease (Table 5).

*Table 5: Median predicted months of survival (from index date) by age – Inpatients without indication of advanced disease*

	<=50	51-60	61-70	71-75	76-80	81-85	>85
Condition/Disease	Median (Number)	Median (Number)	Median (Number)	Median (Number)	Median (Number)	Median (Number)	Median (Number)
<i>Cancers</i>							
Head, neck	<b>33.1</b> (153)	<b>28.2</b> (691)	<b>22.7</b> (535)	<b>17.8</b> (264)	<b>14.7</b> (228)	<b>12.2</b> (147)	<b>8.5</b> (45)
Trachea, Bronchus, and Lung	<b>18.1</b> (647)	<b>14.9</b> (3,838)	<b>10.9</b> (5,363)	<b>8.1</b> (3,365)	<b>6.1</b> (3,511)	<b>4.5</b> (1,944)	<b>2.5</b> (603)
Prostate	<b>66.6</b> (120)	<b>54.2</b> (863)	<b>42.9</b> (1,472)	<b>34.2</b> (1,315)	<b>28.0</b> (1,905)	<b>21.8</b> (1,758)	<b>15.5</b> (1,001)
Colon	<b>45.0</b> (195)	<b>39.1</b> (1,117)	<b>33.2</b> (1,502)	<b>29.1</b> (1,072)	<b>26.1</b> (1,044)	<b>23.1</b> (978)	<b>20.2</b> (427)
Liver	<b>10.4</b> (326)	<b>8.3</b> (1,026)	<b>4.9</b> (722)	<b>2.7</b> (406)	<b>1.2</b> (407)	<b>0.0</b> (242)	<b>-1.6</b> (67)
Pancreatic	<b>13.6</b> (131)	<b>10.1</b> (585)	<b>6.2</b> (636)	<b>3.4</b> (428)	<b>1.5</b> (461)	<b>-0.1</b> (331)	<b>-2.0</b> (139)
Esophageal	<b>14.2</b> (78)	<b>11.8</b> (488)	<b>9.0</b> (499)	<b>6.6</b> (295)	<b>5.0</b> (277)	<b>3.5</b> (175)	<b>2.0</b> (49)
Lymphomas	<b>44.8</b> (433)	<b>35.5</b> (830)	<b>27.9</b> (747)	<b>21.1</b> (499)	<b>16.9</b> (553)	<b>12.6</b> (402)	<b>9.2</b> (153)
Leukemias	<b>27.4</b> (110)	<b>17.6</b> (288)	<b>10.0</b> (353)	<b>4.7</b> (251)	<b>0.9</b> (296)	<b>-2.1</b> (176)	<b>-6.6</b> (81)
Melanoma	<b>52.8</b> (44)	<b>42.9</b> (112)	<b>35.6</b> (119)	<b>28.4</b> (87)	<b>23.9</b> (108)	<b>20.3</b> (87)	<b>14.4</b> (32)
CNS	<b>20.1</b> (190)	<b>13.3</b> (443)	<b>8.5</b> (405)	<b>4.3</b> (200)	<b>1.6</b> (219)	<b>-0.5</b> (129)	<b>-3.7</b> (45)
All other cancers	<b>52.3</b> (5,720)	<b>40.6</b> (14,716)	<b>31.1</b> (14,267)	<b>22.5</b> (8,685)	<b>17.2</b> (9,841)	<b>11.9</b> (6,883)	<b>6.6</b> (2,838)
<i>Other Conditions</i>							
AIDS/HIV	<b>50.4</b> (925)	<b>42.6</b> (588)	<b>34.8</b> (142)	<b>27.7</b> (32)	<b>24.6</b> (17)	<b>21.4</b> (4)	<b>13.6</b> (1)
CHF	<b>69.0</b>	<b>60.9</b>	<b>49.8</b>	<b>44.0</b>	<b>39.2</b>	<b>35.4</b>	<b>29.6</b>
COPD	<b>81.2</b>	<b>73.2</b>	<b>62.3</b>	<b>55.3</b>	<b>50.3</b>	<b>46.3</b>	<b>40.3</b>
Cirrhosis/with paracentesis	<b>49.2</b> (6590)	<b>40.6</b> (11609)	<b>31.0</b> (5094)	<b>23.4</b> (1856)	<b>18.6</b> (1488)	<b>14.7</b> (800)	<b>9.0</b> (231)
Anoxic encephalopathy	<b>38.0</b> (1,368)	<b>29.5</b> (2,698)	<b>22.1</b> (1,894)	<b>16.9</b> (1,090)	<b>13.2</b> (1,178)	<b>9.5</b> (774)	<b>6.5</b> (274)

\*Data based on FY00-02 data only; no "n's" available.

Table 6 shows the median months of predicted survival time for outpatients with indication of advanced disease. This analysis is consistent with the data presented in Table 2 that outpatients with indication of advanced disease with trachea, bronchus and lung, liver, and pancreatic cancers are at high risk of dying in 12 months or less, but it shows that this risk is primarily for patients who are 71 and older. This analysis also finds that patients with esophageal cancer who are 76 and over have a median predicted survival of 12 months or less.

*Table 6: Median predicted months of survival (from index date) by age – Outpatients with indication of advanced disease*

	<=50	51-60	61-70	71-75	76-80	81-85	>85
Condition/Disease	Median (Number)						
<i>Cancers</i>							
Head, neck	45.1 (145)	40.2 (642)	34.7 (503)	29.8 (230)	26.7 (174)	23.6 (92)	21.2 (20)
Trachea, Bronchus, and Lung	20.8 (223)	17.2 (1,013)	13.3 (1,283)	10.5 (823)	8.5 (720)	6.9 (323)	4.9 (81)
Prostate	62.3 (46)	50.4 (358)	38.0 (719)	30.5 (644)	24.3 (842)	18.0 (604)	13.0 (191)
Colon	35.0 (80)	29.7 (365)	23.8 (475)	19.6 (381)	16.7 (400)	14.3 (241)	11.4 (61)
Liver	17.9 (63)	15.5 (210)	12.7 (305)	10.3 (157)	8.7 (127)	7.5 (71)	6.0 (26)
Pancreatic	19.9 (27)	17.1 (115)	13.2 (165)	10.1 (95)	8.2 (89)	6.6 (48)	4.7 (8)
Esophageal	20.7 (39)	18.2 (177)	15.2 (177)	13.3 (104)	11.5 (73)	10.3 (33)	8.8 (7)
Lymphomas	44.1 (39)	36.5 (125)	28.9 (107)	21.3 (62)	17.9 (62)	14.5 (44)	9.8 (14)
Leukemias	NA						
Melanoma	46.9 (58)	36.0 (175)	27.9 (148)	20.7 (101)	16.1 (101)	12.5 (76)	8.0 (28)
CNS	NA	NA	NA	NA	NA	N	NA
All other cancers	54.4 (923)	43.8 (3,622)	33.1 (4,968)	25.7 (9,932)	20.4 (4,216)	16.1 (2,652)	10.8 (824)
<i>Other Conditions</i>							
AIDS/HIV	63.3 (541)	54.7 (555)	46.1 (207)	40.6 (62)	36.7 (52)	33.6 (17)	30.0 (6)
CHF*	NA						
COPD*	NA						
Cirrhosis/with paracentesis	NA						
Anoxic encephalopathy	NA						

Table 7 shows that outpatients who have never had an inpatient stay for the indicated condition and who do not have any indication of advanced disease have median predicted months survival of more than a year for all conditions and age categories combined.

*Table 7: Median predicted months of survival (from index date) by age – Outpatients without indication of advanced disease*

	<=50	51-60	61-70	71-75	76-80	81-85	>85
Condition/Disease	Median (Number)	Median (Number)	Median (Number)				
<i>Cancers</i>							
Head, neck	<b>59.3</b> (2,186)	<b>53.1</b> (7,075)	<b>47.6</b> (6,423)	<b>42.7</b> (3,190)	<b>39.6</b> (2,671)	<b>37.2</b> (1,482)	<b>34.1</b> (455)
Trachea, Bronchus, and Lung	<b>34.7</b> (2,355)	<b>31.2</b> (11,957)	<b>27.2</b> (19,421)	<b>24.4</b> (14,796)	<b>22.4</b> (15,004)	<b>20.8</b> (8,125)	<b>18.8</b> (1,980)
Prostate	<b>92.1</b> (3,102)	<b>79.6</b> (29,346)	<b>67.1</b> (71,078)	<b>59.7</b> (69,950)	<b>53.4</b> (80,794)	<b>48.4</b> (54,798)	<b>42.2</b> (17,002)
Colon	<b>65.9</b> (1,895)	<b>60.0</b> (8,945)	<b>53.5</b> (15,325)	<b>49.9</b> (13,340)	<b>46.9</b> (16,042)	<b>44.6</b> (11,536)	<b>41.6</b> (3,719)
Liver	<b>25.5</b> (623)	<b>23.1</b> (2,291)	<b>20.0</b> (1,771)	<b>17.9</b> (1,129)	<b>16.3</b> (1,075)	<b>15.1</b> (586)	<b>13.6</b> (149)
Pancreatic	<b>33.4</b> (317)	<b>29.9</b> (1,321)	<b>26.0</b> (1,699)	<b>23.2</b> (1,205)	<b>21.3</b> (1,313)	<b>19.7</b> (747)	<b>17.8</b> (234)
Esophageal	<b>35.5</b> (449)	<b>32.7</b> (2,148)	<b>29.7</b> (2,772)	<b>27.5</b> (1,825)	<b>26.0</b> (1,650)	<b>24.8</b> (954)	<b>23.2</b> (247)
Lymphomas	<b>71.2</b> (3,679)	<b>60.1</b> (7,281)	<b>51.7</b> (7,331)	<b>45.7</b> (5,180)	<b>41.5</b> (5,477)	<b>38.1</b> (3,632)	<b>33.9</b> (1,029)
Leukemias	<b>58.6</b> (502)	<b>48.8</b> (911)	<b>41.2</b> (1,046)	<b>35.9</b> (699)	<b>32.1</b> (693)	<b>29.1</b> (406)	<b>25.3</b> (99)
Melanoma	<b>86.1</b> (2,266)	<b>75.3</b> (6,978)	<b>66.2</b> (8,888)	<b>59.9</b> (6,025)	<b>55.4</b> (6,419)	<b>51.7</b> (4,238)	<b>47.2</b> (1,385)
CNS	<b>43.7</b> (1,275)	<b>36.3</b> (2,293)	<b>31.5</b> (1,831)	<b>27.3</b> (924)	<b>24.7</b> (829)	<b>22.5</b> (429)	<b>19.9</b> (95)
All other cancers	<b>92.6</b> (121,046)	<b>77.7</b> (283,279)	<b>67.0</b> (274,832)	<b>59.6</b> (159,306)	<b>54.3</b> (153,750)	<b>50.0</b> (96,502)	<b>44.7</b> (28,846)
<i>Other Conditions</i>							
AIDS/HIV	<b>77.5</b> (10,648)	<b>69.7</b> (6,133)	<b>61.9</b> (1,539)	<b>55.2</b> (396)	<b>50.9</b> (222)	<b>47.8</b> (84)	<b>43.1</b> (23)
CHF*	NA	NA	NA	NA	NA	NA	NA
COPD	<b>87.3</b> (96,693)	<b>72.9</b> (201,864)	<b>61.0</b> (203,440)	<b>52.6</b> (130,951)	<b>46.6</b> (133,041)	<b>41.9</b> (83,476)	<b>35.9</b> (25,305)
Cirrhosis/with paracentesis	<b>67.7</b> (18,868)	<b>59.1</b> (33,185)	<b>49.5</b> (14,206)	<b>41.9</b> (5,365)	<b>37.1</b> (3,713)	<b>33.2</b> (1,605)	<b>28.4</b> (371)
Anoxic encephalopathy	<b>69.3</b> (3,959)	<b>59.7</b> (5,013)	<b>52.3</b> (2,857)	<b>46.4</b> (1,562)	<b>42.7</b> (1,612)	<b>29.7</b> (1,045)	<b>36.0</b> (306)

\*There were no outpatient instances of patients with CHF identified using index date as defined in the methods section.

## *Selection of Components of Case finding Metric – Preliminary Recommendations*

This Rapid Response Project used the criteria listed below to choose conditions for inclusion in the case finding metric.

a. *Focus on "low-hanging fruit"*. There was a general consensus that there would be a higher probability that VA staff would accept and successfully implement a case finding metric if the panel focused on conditions that specialists in all disciplines could agree were indicators of high mortality risk. To quantify the concept of low-hanging fruit, panel members agreed that if a condition resulted in a predicted probability of 50% or more of a patient in a particular category dying within a year, then that condition should be included in the case finding metric.

The statistical analysis used by HCFE researchers (SAS LIFEREG) generated the median predicted number of months survived for patients in each subcategory. In order to choose conditions for inclusion in the case metric we used a cut off threshold of survival time equal to or less than 12 predicted months, which closely approximates the concept of a predicted probability of 50% or more of patients with a particular condition dying within a year.

b. *Multifaceted approach*. Panel members agreed that making recommendations across services and settings instead of focusing solely on patients in one bedsection or with a particular diagnosis would allow each medical facility to implement the recommendations in a way most consistent with its culture. Additionally, expert panel members agreed that recommendations should be broad enough to include both patients very close to death who might benefit from one or two days of services as well as patients who may have months to a year to live and who would benefit from a longer period of HPC services.

c. *ICU events and conditions*. Based on a separate analysis of ICU data by the director of the Inpatient Evaluation center (IPEC), expert panel members agreed on two ICU events and conditions to be included for consideration in the case finding metric. These are patients with length of stay in the ICU of 10 days or more, and (2) patients in the ICU for whom cancer is the primary diagnosis. Patients who are admitted to the ICU for either of these two reasons tend to have one year mortality rates greater than 50%.

d. *Chronic Conditions*. No chronic condition meets the criteria of median predicted months of survival of 12 months or less. However, it was important to the expert panel to include chronic conditions in the case finding metric. As an initial step patients with 2 hospitalizations within a year for either CHF or COPD are included in the case finding metric. Thirty percent of these patients identified in FY2005 died within a year. Further research to identify more precisely which patients are at high risk of dying with these conditions is necessary.

Table 8 summarizes conditions that meet the initial criteria for inclusion in the case finding metric. The majority of these conditions are cancers. Generally, only subsets of the total patient populations qualify for inclusion. For each condition, recommendations for inclusion vary by setting (inpatient and/or outpatient), indication of advanced disease, and age.

Table 8: Summary of categories to be included in the case finding metric based upon survival analysis; "n" based on FY05 data

Condition/Disease	Identification criteria		Inpatient w/indication of advanced disease Age (n)	Inpatient without indication of advanced disease Age (n)	Outpatient w/indication of advanced disease Age (n)	Outpatient without indication of advanced disease Age (n)
	Identifying ICD-9 code(s) or other specification	Indication of advanced disease (n)				
<i>Cancers</i>						
Head, neck	141-148	196,197, 0r 198	61+ (15)	81+ (139)		
Trachea, Bronchus, and Lung	162	197 or 198	All ages (168)	61+ (7045)	71+ (702)	
Prostate	185	197 or 198	71+ (53)			
Colon	153	197 or 198	51+ (88)		>85 (48)	
Liver	155	196, 197 or 198	All ages (12)	All ages (1163)	71+ (120)	
Pancreatic	157	196, 197 or 198	All ages (29)	51+ (576)	71+ (65)	
Esophageal	150	196, 197 or 198	All ages (32)	51+ (697)	76+ (43)	
Lymphomas	200-202	197 or 198	61+ (4)	>85 (142)	>85 (3)	
Leukemias	204.0, 205.0, 206.0, 207.2, 207.8, 208.0	None <sup>1</sup>		61+ (344)		
Melanoma	172	196, 197 or 198	51+ (14)		81+ (58)	
CNS	191	None <sup>2</sup>		61+ (236)		
All other cancers	Remaining cancer ICD_9 codes	197 or 198	51+ (715)	81+ (6379)	>85 (336)	
<i>Other Conditions</i>						
AIDS/HIV	42	See note 1	76+ (1)			
CHF	428	See note 2	All ages (6150)			
COPD	490-492, 493.3, 494-496	See note 3	All ages (4485)			
Cirrhosis/with paracentesis	(571 or 572.3) with 54.91	None		>85 (96)		
Anoxic encephalopathy	348	None		81+ (245)		
ICU stay	Medical ICU stay	LOS >= 10 days;	All ages (7800)			
ICU stay	Medical ICU stay	Cancer Dx	All ages (2200)			

(1) AIDS/HIV - 042 with at least one the following secondary diagnoses: hepatoma (155), cirrhosis (571.2, 571.5), lymphoma (200), cachexia (799.4), other cancer (140-172, 174-208); (2) CHF - Patients with 2 hospitalizations within 6 months, each with a primary dx of CHF; (3) COPD - Patients with 2 hospitalizations within 6 months, each with a primary dx of COPD.

In addition to noting which categories meet the criteria, this table includes an “n” that indicates how many patients in each category were identified nationwide in VA in FY2005. This number while not generalizable to any other year gives some sense of how many patients might have benefited from hospice and palliative care services in FY2005. For operational purposes, particularly staffing decisions, it is very important to have some sense of the total number of patients that might be identified if a case finding metric were implemented. In FY2005 as many as 7,045 inpatients with trachea, bronchus and lung cancer who had no indication of advanced disease, ages 61+, might have benefited from HPC service. Similarly, 1,163 inpatients with liver cancer, of all ages, also without any indication of advanced disease might have benefited. Yet another category of patients who might have benefited were inpatients with ‘all other cancers’, ages 81+, with no indication of advanced disease. There were 6,379 patients who fell into this category.

Other categories with large numbers of patients include patients with CHF and COPD who had two hospitalizations within 6 months and ICU patients who had length of stay of 10 days or greater or who had a principal diagnosis of cancer in the ICU.

In sum, if one were to add all patients identified in all categories marked for consideration approximately 40,000 (very roughly 1,900 per VISN) patients would have potentially benefited from HPC services in FY2005. This is broken down into 1,131 inpatients with cancer with indications of advanced disease, 16,721 inpatients with cancer without indication of advanced disease, 10,636 patients with either CHF or COPD who had 2 hospitalizations within 6 months and 10,000 patients in the ICU with LOS of 10 days or more or a cancer diagnosis, and 1,375 outpatients with cancer with indication of advanced disease.

How many of these patients currently receive HPC services? This is actually very difficult to assess, particularly using national datasets. There are two codes within VA that indicate provision of hospice and palliative care transmitted to the national databases - ICD-9 code v66.7 and TS96. V66.7 is defined as an “encounter for palliative care.” Subheadings include “end-of-life care,” “hospice care” and “terminal care.” V66.7 is always a secondary diagnosis with the underlying disease coded first. TS96 indicates a patient is receiving hospice care in a VA nursing home setting. There are many issues involved with the use of both of these codes. There is no guarantee that codes are used consistently from one facility to the next. There is also no consistent definition of what the code might mean even if it is used. Codes could potentially indicate anything from a phone call, to the one time administration of a pain medication to a consistent course of daily palliative treatment. It is very possible that the limited use of the codes undercounts the amount of hospice and palliative care services provided throughout the VA system.

Given these limitations, however, one still may observe that variation exists among VISNs in their efforts to provide hospice and palliative care. To indicate this variation, we conducted an analysis that included patients with any of the recommended cancer conditions for the case finding metric in FY 2005 (for inpatients without indication of advanced disease). Next we identified how many of them were coded with either a v66.7 or TS96 at any point in time in FY 2005. We found that the percentage of patients coded with either of these indicators ranged across VISNs from a low of 7.7% to a high of 29.9% (not shown). For the patients in this

analysis who died, the percentage of patients assigned either v66.7 or TS96 ranged from a low of 10.4% to a high of 37%. This suggests, at a minimum, great variation from one VISN to the next with some VISNs offering some type of HPC services to approximately 30% of patients and other VISNs offering HPC services to as few as 10% of patients. Certainly, this is an area that needs further investigation.

### **Part III: Summary and Next Steps**

This project is an initial step in attempting to identify patients at high risk of death using national data. As previously discussed, it is very difficult to predict mortality for an individual person. Based upon the survival analysis HCFE researchers concluded that for certain cancers, it appears that information in administrative databases may be helpful in predicting whether or not a certain population of patients has a predicted probability of dying within a year. Supplemental analyses support recommendations to consider chronic conditions and ICU related events and conditions for consideration for inclusion in the case finding metric. Refinements to this initial analysis might include extending predictive variables to include biological factors such as stage of disease and laboratory results. This information is not generally available on a national basis so either a decision would need to be made at the national level to collect this information for inclusion in national level datasets or this type of analysis would need to be conducted at the individual facility level which collects this data.

Many further areas remain to be explored. They include:

#### *Chronic Conditions*

No chronic condition meets the criteria of median predicted months of survival of 12 months or less. However, the expert panel thought it important to include chronic conditions in the case finding metric. As an initial step, patients with either COPD or CHF who have 2 hospitalizations within 6 months are included in the metric. Thirty percent of these patients identified in FY2005 died within a year. Further research to identify more precisely which patients are at higher risk of dying is necessary. One suggestion is to combine all utilization information for patients with CHF and COPD and analyze the combined effects using the survival analysis model. Total utilization would include ER visits, urgent care visits, acute admissions, ICU admissions, clinic visits, walk-in clinic visits and use of home oxygen. The hypothesis would be that total utilization is an indicator of more serious disease and thus would be associated with lower predicted median months survival. Another area of research would be to build on other researchers' efforts that have focused on predictors of mortality such as FEV 1 (forced expiratory volume in one second), BMI (body mass index), and subjective estimates of dyspnea for COPD and the New York Heart Association (NYHA) classification of stage of disease severity, systolic blood pressure, left ventricular ejection fractions and blood-urea nitrogen levels among others for CHF (Rosenfeld 2003, Tsai Feb. 2006, Reisfield, Sept. 2005).

#### *Functional status*

Expert panel members suggested analyzing functional status of patients both in acute care and long term care settings as predictive of mortality. In VA, functional status of nursing home patients is captured using the Minimum Data Set (MDS), so analyzing MDS data and merging it with other data from the national VA administrative datasets might be one way to approach this

type of analysis. Functional status might be an independent predictor or might indicate mortality risk only in conjunction with particular diagnoses. On a nationwide basis VA does not collect data on functional status for acute care patients. Some have advocated for a VA directive to mandate recording of functional status and transmission of this data to the national datasets, perhaps by including functional status as the 6<sup>th</sup> vital sign.

#### *Nursing homes*

Predicting mortality among nursing home patients is yet another area requiring more analysis. In addition to looking at functional status as mentioned above, panel members suggested focusing on patients with specific conditions such as Alzheimer's disease. Additionally, panel members expressed interest in the mortality risk of nursing home patients admitted to a nursing home from an acute care stay and those admitted to an acute stay from a nursing home. Several published, fairly simple-to-use algorithms exist that combine MDS data, patient demographic data, and data available from the national datasets that could potentially be researched for their applicability to patients in VA nursing home settings (Morris 2005, Mitchell 2004).

#### *Assessing V66.7 and TS96 codes*

As suggested in the text of the report it is not at all clear how consistently these codes are used within VA from one facility to the next. Furthermore, it is unclear what information the codes convey. Clarification of these issues might result in better understanding by VA of current HPC efforts and also might allow VA to plan more precisely a national strategy for HPC.

#### *Implementation*

Finally, expert panel members spent a great deal of time discussing how to implement a case finding metric. Integrating the case finding metric into the VA Office of Quality Performance's performance measures might be possible and desirable, but panel members suggested that piloting the metric in one or two VISNs or at least in several facilities before implementing it on a national level. Another option would be to phase in the metric by condition. Competitive funding for innovative approaches within VISNs was another suggestion. Suggested strategies for implementing the metric within a facility included identifying HPC champions within services, providing training and education to clinical staff, using palliative care physicians to provide direct care, as consultants, or as both, and creating a clinical reminder to be incorporated into the electronic record system.

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## Appendix A

### **MEMBERS - EXPERT PANEL**

#### *Chairperson*

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Appendix B

**Specifications for Case Finding Metric: 12-06-06**

Condition/Disease	Identifying ICD-9 codes	Chemotherapy drugs as indicative of advanced disease	Other indications of advanced disease
Head, neck*	141-148	Not necessary	with any secondary diagnosis code of 196, 197, 198
Trachea, Bronchus, and Lung**	162	Not necessary	197, 198
Prostate**	185	Docetaxel or Mitoxantrone or Paclitaxel or Calcitriol or Estramustine	with 197 or 198
Colon**	153	Not necessary	197,198
Liver* **	155	Not necessary	196 or 197 or 198
Pancreatic* **	157	Not necessary	196 or 197 or 198
Esophageal**	150	Not necessary	196 or 197 or 198
Lymphomas	200-202	Cisplatin (Large cell lymphoma)	with 197 or 198
Leukemias**	204.0, 205.0, 206.0, 207.2, 207.8, 208.0	For patients age 70+	NA
Melanoma* **	172		with 196, 197 or 198
CNS	191		NA
All other cancers*	Remaining cancer ICD-9 codes (140-239)		with 197 or 198
AIDS/HIV*	42		042 with at least one the following secondary diagnoses: hepatoma (155), cirrhosis (571.2, 571.5), lymphoma (200), cachexia (799.4) or other cancer (140-172, 174-208)*; with any cancer w/197 or 198
CHF*	428*		Patients identified with a dx of CHF in inpatient or outpatient files with 2 hospitalizations within 6 months with principal dx for each hospitalization of CHF*
COPD*	490-492, 493.3, 494-496		Patients identified with a dx of COPD in inpatient or outpatient files with 2 hospitalizations within 6 months with principal dx for each hospitalization of COPD*
CHF*	428		Patients with at least 1 ICU stay with a Dx principal of CHF (428) *
COPD*	490-492, 493.3, 494-496		Patients with at least 1 ICU stay with a Dx principal of COPD (490-492, 493.3, 494-496) *
Multiple transfers while in hospital***	NBS =Number of bedsections		Is this any transfer? Or is it just acute transfers? Or is it transfers in direction of more acuity (ie. NH to Acute Care to ICU)?
Cirrhosis/with paracentesis***	(571 or 572.3) with 54.91		Not sure whether cirrhosis with paracentesis will pick up many patients at high risk of dying; consider perhaps patients in ICU with a dx of cirrhosis.
ICU related analyses	Medical ICU=12; Surgical ICU=63		
Intensive Care Unit Criteria from David Weissman **** (next 9 rows)			
Admission from a nursing home in the setting of one or more chronic life-limiting conditions (e.g. dementia)	Very imp.		
Two or more ICU admissions within the same hospitalization	Very imp.		

Prolonged or difficult ventilator withdrawal	Very imp.		
Multi-organ failure	ICD-9 codes???		
Consideration of ventilator withdrawal with expected death	chart review		
Metastatic cancer			
Anoxic encephalopathy			Anoxic brain damage = ICD-9 348. Consider not limiting to the ICU; Use in any inpatient bedsection.
Consideration of patient transfer to a long-term ventilator facility			
Family distress impairing surrogate decision-making			
<b>ADDITIONAL SUGGESTIONS</b>			
Functional Status***			
CARING Criteria - resident in NH; admitted to hospital >=2 times in yr.; resident in NH w/ multiple hospital admissions; primary diagnosis cancer; ICU w/MOF; >=2 NHPCO noncancer hospice guidelines***			
Nursing home patients +dementia + acute care***			
Nursing home patients + functional status(as determined by MDS) + acute care***			
Nursing home patients + prognosis of less than 1 yr (based on MDS algorithms in literature).***			ICD-9 196 = Secondary and unspecified malignant neoplasm of lymph nodes; ICD-9 197 = Secondary malignant neoplasm of respiratory and digestive systems; ICD-9 198 = Secondary malignant neoplasm of other specified sites for example (kidney, brain, skin, bone...)

## Appendix C

### **Palliative Care Index (Developed by VHA)**

**Definition:** Palliative care refers to the comprehensive management of the physical, psychological, social, spiritual and existential needs of patients with incurable, progressive illnesses. Palliative care affirms life and regards dying as a natural process that is profoundly personal for the individual and family. The goal of palliative care is to achieve the best possible quality of life through relief of suffering, control of symptoms, and restoration of functional capacity while remaining sensitive to personal, cultural, and religious values, beliefs and practices.

**Numerator:** Patients with terminal diagnoses or advanced, progressive, incurable illness who are receiving ongoing care through VHA, who have documentation of an individualized plan for comprehensive, coordinated, palliative care services that minimizes physical, psychological, social and spiritual suffering and optimizes the patient's quality of life. Documentation includes evidence of the following:

- Admission to a community hospice program, VA Palliative Care Program, VA Hospice Program, or VA Home Based Primary Care OR
- An individualized plan that includes:
  - Discussion of care alternatives and treatment settings with the patient and/or his family
  - Discussion of Advance Directives
  - Effective palliative symptom management (e.g., pain, dyspnea, and mental distress)
  - Psychological, social and spiritual support for the patient
  - Family/care giver support (e.g., counseling, respite care, and referral to community resources)
  - Continuity of care coordinated over a continuum of healthcare settings.

**Denominator:** A random sample of patients with cancer diagnoses (ICD9): liver (155), pancreas (157), esophageal (150); patients with cancer of the trachea, bronchus and lung (162), colon (153), leukemia (204.0, 205.0, 206.0, 207.2, 207.8, 208.0), Lymphosarcoma (201.1), hodgkins disease (201), or multiple melanoma (203.0) not being treated for cure; patients with metastatic cancer of the breast (198.81) or prostate (198.82), or patients with melanoma (172); AIDS (042); chronic renal failure on dialysis (585 with 39.95, 54.98, V 5.60); or patients with CHF (428) or COPD (490-496) who have 2 or more hospitalizations or 1 or more [CU admissions for CHF or COPD in the last 6 months.

**Goals:**

Fully successful: 95% FY 98 patients have plan or referral in snapshot taken in 4<sup>th</sup> quarter.

**Exceptional:** Effective palliative symptom management that includes documented assessment of symptoms (100%), interventions for identified symptoms (90%), and evaluation of effectiveness of interventions (80%). Snapshot will be taken in 4<sup>th</sup> quarter

**Data Source:** EPRP monthly chart review

## Appendix D

### *List of Criteria for Palliative Care Referrals by National Consensus Project (NCP) Domains*

#### **PHYSICAL DOMAIN**

##### **By Diagnosis**

###### **Cancer**

- Malignancy, any type, Stage IV
- Stage IV = primary with metastasis (mets) to distant organ, e.g. breast cancer with mets to bone, lung or brain, prostate cancer with mets to bone and or failed remission
- National Comprehensive Cancer Network (NCCN) guidelines
- Advanced symptomatic progressive disease
  - And/or life expectancy  $\leq$ 12 months
  - Serious co-morbid conditions
  - Patient/family request
- Stage III or IV with limited life expectancy

###### **NSCLC**

- Cancer is non-resectable
- Cancer is inoperable
- Cancer is IIIB or IV
- Cancer is IIIA and patient will not be receiving curative treatment

###### **Global Anoxic Encephalopathy**

- Patient has any combination of the following in the first 24 hrs after cardiac arrest, smoke inhalation or severe hypotension in the absence of sedation:
  - Absent papillary response
  - Extension (decerebrate) or no posturing to deep pain
  - Myoclonic jerks
- There is no return to consciousness after 48-72 hrs

###### **Advanced Stage Dementia**

- Poor pre-hospital functional status, including any combination of the following:
  - Stage  $\geq$ 6 on FAST functional scale
  - Non-ambulatory
  - Incomprehensible or no speech
  - Incontinent
  - Nourishes poorly by mouth, or is nourished by tube
  - Pressure ulcers
- Patients with advance dementia who are referred for a PEG tube placement \*

###### **Multiple Organ System Failure**

- 3 major systems in failure for 3 or more days, as evidenced by:
  - Respiratory: mechanically ventilated
  - Cardiac: 1 or more vasoactive drugs
    - Levophed (Norepinephrine)
    - Phenylephrine/Neosynephrine
    - Dopamine
    - Dobutamine
  - Renal: urine output  $<$  400cc/24 hrs or serum creatinine  $>$ 3.5 mg/dl, or BUN  $>$ 100mg/dl
  - CNS: GCS  $>$ 6 in absence of sedation
  - Hematologic: WBC  $<$ 1000, or platelets  $<$ 20,000, or hematocrit  $<$ 20%

#### Congenital or genetic abnormalities

- Neonates w/ congenital or genetic abnormalities incompatible w/life beyond 1 yr (trisomy 18, myotubular myopathy, etc.)

#### CHF/Cardiac Disease patients

- Ejection Fraction of <25% or New York Heart Association (NYHA) classification of stage III or IV
- Two or more hospitalizations for CHF in past year
- One or more ICU stay for CHF in the past year
- Two or more ER visits for CHF in the past year
- Patient likely to die within 1-2 years
- CHF causes patient major functional or quality of life impairment, and may or may not be classified as NYHA classes II-IV

#### COPD/Respiratory Failure

- O<sup>2</sup> needed in order to perform ADLs and/or Karnofsky score of <50

#### Chronic Disease

- Repeat hospitalization for exacerbation of chronic disease within a 6-month period, CHF, COPD, Alzheimer's with PNA sepsis
- Advanced chronic disease patient w/o advanced directive
- Chronic disease patient outstaying their DRG due to treatment related morbidity or severe disease

#### By Symptom/Condition

- S/P resuscitation
- Recurrent aspiration in any neurologic disease patient w/ poor palliative performance status, i.e., PPS <40
- Albumin less than 2.6 mg/dl in chronic disease patient w/ declining functional capacity
- Has a life-limiting illness and has chosen not to have life-prolonging therapy
- Has unacceptable pain for 24 hrs or more
- Has uncontrolled symptoms, i.e., nausea, vomiting, shortness of breath
- Has frequent visits to ER (more than 1x/month)
- Has more than 1 hospital admission for the same diagnosis in last 30 days
- Has prolonged LOS w/o evidence of progress
- Two unscheduled hospitalizations and/or emergency dept. episodes during the prior 6 months
- Two episodes of aspiration pneumonia during prior 6 months
- Evidence of failure to thrive w/ unintentional weight loss greater than 10% of body weight during prior 6 months
- Clinician/caregiver determines patient would benefit from palliative care services
- Turning points: treatment no longer working w/ limited or no further treatment options
- Patient with advanced dementia who is referred for a PEG tube\*

#### By Location

##### ICU\*

- Nursing home residents admitted to any ICU
- Repeat stay or second intubation within 6 weeks in ICU
- Age >90 in ICU
- Greater than a 10-day stay in ICU
- Multiple organ system failure as defined by:
  - 3 or more failed systems for >3 days
  - Mechanically ventilated
  - Pressors
  - UOP <400cc/24h or Creatinine >3.5 or BUN>100
  - GCS <6 in absence of sedation
  - Hgb <6.6 or plts <20,000 or WBC <1000
- Cardiac arrest – pre-hospital admitted to ICU

- ICU admission w/ or w/o mechanical ventilation for COPD, CHF or several years duration
- Is in ICU with documented poor prognosis

**ER\***

- ECF/SNF patient with Do Not Resuscitate (DNR) and/or Comfort Care (CC)
- Patient previously discharged from the Acute Palliative Care Unit
- Patient has a DNRCC-arrest code status
- Patient/caregiver/physician desires hospice but has not been referred
- Patient has multiple admissions to the hospital (3 or more within 6 months) with same symptoms
- Patient has advanced disease with frequent infections
- Patient has nutritional complications with an albumin of less than 2.5 mg/dl
- Patient is mostly bed bound
- Patient is a hospice patient with a full code status
- Patient with advanced disease with tube feeding

**PSYCHOLOGICAL AND PSYCHIATRIC DOMAIN**

- Family support needed or communication challenges exist
- Patient and family desire for care planning for future
- Complicated psychosocial issues
- Team/patient/family needs help with complex decision-making and determination of goals of care

**SOCIAL DOMAIN**

- Family caregiver reports increasing care needs
- Family support needed or communication challenge exists

**SPIRITUAL, RELIGIOUS AND EXISTENTIAL DOMAIN**

- Patient needs spiritual, religious or existential support
- Family needs bereavement support

**CULTURAL DOMAIN**

- Patient/family has particular cultural needs

**ETHICAL AND LEGAL DOMAIN**

- Patient/family needs help with ethical, legal or regulatory aspects of medical decision-making

\*Automatic Referral Criteria

## Appendix E

### **General Referral Criteria (one or more of the following)**

*Presence of a serious life limiting illness and:*

- Declining ability to complete activities of daily living or
- Weight loss or
- Multiple hospitalizations (e.g. two w/in 30 days) or
- Difficult to control physical or emotional symptoms related to serious medical illness or
- Patient, Family or Physician uncertainty regarding prognosis or
- Patient, Family or Physician uncertainty regarding appropriateness of when to shift away from cure or life-prolonging care or.
- Patient or family requests for futile care or
- DNR order conflicts or
- Conflicts regarding the use of non-oral feeding/hydration in cognitively impaired, seriously ill, or dying patients or
- Limited social support and a terminal illness (e.g. homeless, chronic mental illness) or
- Patient, family or physician request for information regarding hospice appropriateness or
- Patient or family psychological or spiritual distress.

### **Intensive Care Unit Criteria**

- Admission from a nursing home in the setting of one or more chronic life-limiting conditions (e.g. dementia)
- Two or more ICU admissions within the same hospitalization
- Prolonged or difficult ventilator withdrawal
- Multi-organ failure
- Consideration of ventilator withdrawal with expected death
- Metastatic cancer
- Anoxic encephalopathy
- Consideration of patient transfer to a long-term ventilator facility
- Family distress impairing surrogate decision-making

### **Oncology Criteria**

- Metastatic or locally advanced cancer progressing despite systemic treatments with or without weight loss and functional decline;
  - √ Karnofsky < 50 or ECOG  $\geq$  3
  - √ Progressive brain metastases following radiation
  - √ New spinal cord compression or neoplastic meningitis
  - √ Malignant hypercalcemia
  - √ Progressive pleural/peritoneal or pericardial effusions
  - √ Failure of first or second-line chemotherapy
  - √ Multiple painful bone metastases
  - √ Consideration of interventional pain management procedures

- √ Severe prolonged pancytopenia in the setting of an untreatable hematological problem (e.g. relapsed leukemia)

### **Emergency Department Criteria**

- Multiple recent prior hospital with same symptoms/problems
- Long-term care patient with Do Not Resuscitate (DNR) and/or Comfort Care (CC) orders
- Patient previously enrolled in a home or residential hospice program
- Patient/caregiver/physician desires hospice but has not been referred
- Consideration of ICU admission and or mechanical ventilation in a patient
  - √ with metastatic cancer and declining function
  - √ with moderate to severe dementia
  - √ with one or more chronic diseases and poor functional status

Appendix F

Advanced Disease Criteria - Joan Penrod, Sean Morrison, Carol Luhrs	
<p>All patients age 18 and older admitted to the <b>five</b> VISN 3 acute care facilities FY03 and FY04 <b>who have not been a PC patient in a previous hospitalization</b> with at least one of the following advanced diseases: (1) metastatic solid tumor, (2) CNS malignancies, (3) metastatic melanoma, (4) locally advanced head and neck cancer, (5) locally advanced pancreatic cancer, (6) HIV/AIDS <b>and at least one the following secondary diagnoses: hepatoma, cirrhosis, lymphoma, cachexia or other cancer</b>, (7) CHF or COPD and either two or more hospitalizations in any six months of the study period or one or more ICU admissions for CHF or COPD during the study period. These diagnoses and stage of disease include those that are considered appropriate for palliative care by other palliative care researchers and clinicians. <sup>[36,41,42,47,48,68-70]</sup> We will use ICD-9 codes for each of these advance diseases listed below in Table 4.B.1. Potential hospitalizations will be excluded if (1) the reason for hospitalization was for routine chemotherapy, or (2) length of hospital stay was less than 48 hours.</p>	
Table 4.B.1. Inclusion criteria for advanced disease cohort	
Disease Description	ICD-9 Codes
Metastatic Solid Tumors	197, 198
CNS Malignancies	191
Metastatic Melanoma	172 with any secondary diagnosis code of 196
Locally Advanced Head and Neck Cancer	141-148 with any secondary diagnosis code of 196
Locally Advanced Pancreatic Cancer	157 with any secondary diagnosis code of 196
AIDS/ HIV	042 with at least one the following secondary diagnoses: hepatoma (155), cirrhosis (571.2, 571.5), lymphoma (200), cachexia (799.4) or other cancer (140-172, 174-208)
Advanced CHF/COPD	<b>428, 490-492, 493.2, 494-496 with either (1) 2 or more hospitalizations in any 6 months during study period, or (2) 1 or more ICU admissions for CHF/COPD during study period</b>

## ENDNOTES

1. Other cancers include all cancers coded with ICD-9 codes 140-239 with the exception of those listed separately in the specifications (and myeloma which was originally included in the specifications but later removed). To give some idea of which cancers may predominate, we analyzed all patients in the “other cancers” category who were also inpatients with indication of advanced disease. We found that there were more than 100 patients over 5 years for each of the following conditions: malignant neoplasm of the stomach (ICD-9 151), 156 patients; malignant neoplasm of rectum, rectosigmoid junction and anus (ICD-9 154), 200 patients; and malignant neoplasm of kidney and other unspecified urinary organs (ICD\_9 189), 179 patients.

Of note also is that ICD-9 codes 140-239 include codes for benign neoplasms (210-229). Calendar year 2000 Medicare data suggest that within the short stay hospital population 8.74% of cancers are benign. (Health Care Financing Review, 2002 Statistical Supplement, p. 152, Table 27: CY 2000 data – Medicare Beneficiaries Discharged From Short-stay Hospitals.)