Prognostication

Janet Bull, MD FAAHPM

Four Seasons
Faculty Disclosure

It is the policy of the Oregon Hospice Association to insure balance, independence, objectivity, and scientific rigor in all its educational programs. All faculty participating in any Oregon Hospice Association sponsored programs are expected to disclose to the program audience any real or apparent affiliation(s) that may have a direct bearing on the subject matter of the continuing education program. This pertains to relationships with pharmaceutical companies, biomedical device manufacturers, or other corporations whose products or services are related to the subject matter of the presentation topic. The intent of this policy is not to prevent a speaker from making a presentation. It is merely intended that any relationships should be identified openly so that the listeners may form their own judgments about the presentation with the full disclosure of the facts.

The presenter has nothing to disclose.
Objectives

- Explain how prognostication affects decision making
- Describe the 4 common pathways to death
- Identify the common denominators to decline which are universal despite diagnosis
- Improve prognostication skills by disease categories
- Understand when to refer patients to hospice and palliative care with guidance on proper diagnosis
“As a result of a failure to prognosticate, let alone prognosticate accurately, patients may die deaths they deplore in locations they despise. They may seek noxious chemo-therapy rather than good palliative care, enroll in clinical trials of experimental therapy that offer more benefit to researchers than to themselves, or reassure loved ones that it is not yet time to pay a visit – only to lapse into a coma before having a chance to say good-bye.”

Nicholas Christakis MD PhD
## How Dying Has Changed - US

<table>
<thead>
<tr>
<th></th>
<th>1900</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pneumonia</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>2.</td>
<td>Tuberculosis</td>
<td>Cancer</td>
</tr>
<tr>
<td>3.</td>
<td>Diarrhea &amp; Enteritis</td>
<td>COPD</td>
</tr>
<tr>
<td>Life expectancy:</td>
<td>47 years</td>
<td>78.7 years</td>
</tr>
<tr>
<td>Disability:</td>
<td>Days to Weeks</td>
<td>Weeks to Years</td>
</tr>
</tbody>
</table>
Chronic Disease

- Nearly 1 in 2 Americans has a chronic disease
- Projected to increase – 157 million Americans by 2020; 171 million by 2030
- Americans are living longer – from 2010 to 2030 > 65 years old increase 13.2% to 20%
- 90% seniors have at least one chronic disease, 77% have 2
- 24% – disability

Chronic Conditions: Making the case for ongoing care. RWJ – 9/2004 update
Patients with Chronic Illnesses

Americans Are Living Longer

• By 2030, 20 percent of the population will be people age 65 and older with chronic conditions.

• Life expectancy at birth increased over 44% between 1900 and 1950, 13% between 1950 and 2000, and between 2000 and 2050 life expectancy is projected to increase by 9%.

Multiple Chronic Conditions

Source: Medical Expenditure Panel Survey, 2001

Johns Hopkins University, Partnership for Solutions
Prognosis

- Provides framework to make informed decisions about care
- Provides life-care planning
  - spiritual
  - financial
  - psychosocial – relationships/forgiveness
  - opportunity to say goodbye
  - life closure and legacy giving
Discussion of Prognosis and Goals Leads to Different Medical Care in the Last Week of Life

**Table 3. Medical Care Received in the Last Week of Life by End-of-Life Discussion**

<table>
<thead>
<tr>
<th>Service</th>
<th>Total (N=332)</th>
<th>End-of-Life Discussion</th>
<th>Adjusted OR (95% Confidence Interval)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical care received in the last week</td>
<td>332</td>
<td>123 (37.0)</td>
<td>209 (63.0)</td>
<td></td>
</tr>
<tr>
<td>ICU admission</td>
<td>31 (9.3)</td>
<td>5 (4.1)</td>
<td>26 (12.4)</td>
<td>0.35 (0.14-0.90)</td>
</tr>
<tr>
<td>Ventilator use</td>
<td>25 (7.5)</td>
<td>2 (1.6)</td>
<td>23 (11.0)</td>
<td>0.26 (0.08-0.83)</td>
</tr>
<tr>
<td>Resuscitation</td>
<td>15 (4.5)</td>
<td>1 (0.8)</td>
<td>14 (6.7)</td>
<td>0.16 (0.03-0.80)</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>19 (5.7)</td>
<td>5 (4.1)</td>
<td>14 (6.7)</td>
<td>0.36 (0.13-1.03)</td>
</tr>
<tr>
<td>Feeding tube</td>
<td>26 (7.9)</td>
<td>11 (8.9)</td>
<td>15 (7.3)</td>
<td>1.30 (0.55-3.10)</td>
</tr>
<tr>
<td>Outpatient hospice used</td>
<td>213 (64.4)</td>
<td>93 (76.2)</td>
<td>120 (57.4)</td>
<td>1.50 (0.91-2.48)</td>
</tr>
<tr>
<td>Outpatient hospice ≥1 wk</td>
<td>173 (52.3)</td>
<td>80 (65.6)</td>
<td>93 (44.5)</td>
<td>1.65 (1.04-2.63)</td>
</tr>
</tbody>
</table>

Abbreviation: ICU, intensive care unit; OR, odds ratio.

a The propensity-score weighted sample was used for these analyses. Logistic regression models were also adjusted for patients’ treatment preferences, desire for prognostic information, and acceptance of terminal illness.

Costs Go Down 48 Hours After Palliative Care Consultation

Mean direct costs/day for patients who died and who received palliative care consultation versus matched usual care patients

![Graph showing the comparison of direct costs/day between usual care and palliative care consultation patients over hospital days. The graph demonstrates a decline in costs 48 hours after the consultation.]
Prognostication in Cancer

Oncologists
Only 37% - frank disclosure
20% accuracy
63% overestimate

Prognostication in Cancer

- 50% < 6 month survival
- Systemic review 383 articles
- Universal picture of decline
- Little evidence that treatment influenced survival time
- Hospice – median survival time – 3 wks

Salpeter, S. Systemic Review of Cancer Presentations with a median survival of 6 months or less JPM Vol 14, 2011
Prognostication in Non Cancer

- Universal factors - ≥ 50% 6 mo mortality
  - Poor performance status
  - Advanced age
  - Malnutrition
  - Co-morbidities
  - Organ dysfunction
  - Hospitalization for acute decomposition

- Treatment did not improve prognosis

Salpeter, S Systematic Review of Noncancer Presentations with a median survival of 6 months or less  AJMed 2011
Prognostication

‘Would you be surprised if your patient died within the next year?’

Lynn, 2005
What is the Clinical Course?

<table>
<thead>
<tr>
<th></th>
<th>Disease - Stable</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Disease - Stable</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Disease - Unstable</td>
<td>Months</td>
</tr>
<tr>
<td>C</td>
<td>Deteriorating, Exacerbations</td>
<td>Weeks</td>
</tr>
<tr>
<td>D</td>
<td>End of Life</td>
<td>Days</td>
</tr>
</tbody>
</table>

Disease Trajectories/ADLs

- Sudden death
- Cancer
- Organ Failure
- Frailty / Dementia

Sudden Death

- Accounts for about 10% deaths
- Examples – AMI, CVA
- Often highly functional prior to death (7 ADLs)

- Dependence
  - 1 year prior to death – .69 ADL
  - 1 month prior to death – 1.22 ADL

Lunney, JR, JAMA 2003 289 (18) 2397-92 Patterns of Functional Decline
Cancer

- Accounts for 30% of all deaths
- Highly functional early on with slow steady decline 3 months prior to death
  - 1 year prior to death – .77 ADL
  - 3 months prior to death – 4.09 ADL
Disease Trajectories

"Cancer" Trajectory, Diagnosis to Death

- **High**
- **Cancer**
- **Low**

- **Onset of illness**
  - Decline usually 3 months
- **Death**
Organ Failure

- Account for 40% of all deaths
- Multiple exacerbations, often frequent hospitalizations
- Generally die during exacerbations
- Renal, liver, cardiac, pulmonary
- Functional status fluctuates with overall slow decline
  - 1 year prior to death – 2.1 ADL
  - 3 months prior to death – 3.66 ADL
Disease Trajectories

Organ System Failure Trajectory

(mostly heart and lung failure)

Multiple hospitalizations → Death usually follow disease exacerbation

Time frame – usually 2-5 years
Frailty

- Accounts for 20-30% of all deaths
- Elderly women with multiple co-morbidities
- Dementia often present
- Very slow rate of decline, with early functional decline
  - 1 year prior to death – 2.92 ADL
  - 1 month prior to death – 5.84 ADL
Disease Trajectories

Frailty / Dementia Trajectory

High dependence on ADLs early in disease course

Time frame - usually 6-8 years

Function

High

Low

Death

Slow decline
Prognosis

Important factors to consider

- Co-morbid illnesses
- Rate of decline
- Nutritional status
- Functional status
- Cognitive status
- Age and gender
- Number of hospitalizations in past year
- Will to live
- Other (psychosocial, emotional and spiritual)
Depression and Social Isolation

- Increased rates of hospitalization
- Increased mortality post MI
- Increased mortality from cancer
- Overall higher mortality rates from all diseases
- Lower immune functions
- Depression and social isolation independent risk factors
Spiritual Beliefs and Prognosis

- Major source of coping
  - 85% hospitalized patients
  - 40% most important factor

- Multiple studies in chronic diseases demonstrate source of coping

- Suggested role in improving depression

- Literature demonstrates beneficial effects on health outcomes
Prognostication Tools

- Prognostic Indicators - MACs
- Disease Specific Tools (FAST, MRI, BODE, MELD, NYHA, Albumin, Cr cl, BNP, CO2)
- BMI/weight
- ADLs
- MMSE/clock drawing
- PPS/Karnofsky
- Rapidity of decline
- Co-morbidities
- Secondary conditions
Prognosis

- Co-morbidities – associated conditions not related to the primary illness
  
  Dementia patient – cardiac disease, pulmonary, etc.

- Secondary conditions – conditions directly related to the primary diagnosis
  
  Dementia patient – delusions, dysphagia, pressure ulcers
Prognostic Tools

- **Prognostat** – age, gender, diagnosis, PPS

- **Palliative Prognostic Score (PaP)** – FF #124
  - KS, WBC, lymphocytes, clinical, anorexia, dyspnea

- **Palliative Prognostic Index (PPI)**
  - PPS, edema, oral intake, dyspnea, delirium in cancer patients
# Palliative Prognostic Score

## Calculation of the Palliative Prognostic (PaP) Score

<table>
<thead>
<tr>
<th>PROGNOSTIC FACTORS</th>
<th>CHARACTERISTIC</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspnea</td>
<td>Absent</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Present</td>
<td>1</td>
</tr>
<tr>
<td>Anorexia</td>
<td>Absent</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Present</td>
<td>1.5</td>
</tr>
<tr>
<td>KPS</td>
<td>≥ 50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>30–40</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10–20</td>
<td>2.5</td>
</tr>
<tr>
<td>CPS</td>
<td>&gt; 12 weeks</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>11–12 weeks</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>9–10 weeks</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>7–8 weeks</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>5–6 weeks</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>3–4 weeks</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>1–2 weeks</td>
<td>8.5</td>
</tr>
<tr>
<td>Total WBC count</td>
<td>Normal (4,800–8,500 cells/mm³)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>High (8,501–11,000 cells/mm³)</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Very high (&gt;11,000 cells/mm³)</td>
<td>1.5</td>
</tr>
<tr>
<td>Lymphocyte %</td>
<td>Normal (20.0%–40.0%)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Low (12.0%–19.9%)</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Very low (0%–11.9%)</td>
<td>2.5</td>
</tr>
</tbody>
</table>

To calculate the PaP score, add the dyspnea score + anorexia score + KPS score + CPS score + total WBC count score + lymphocyte % score.

Abbreviations: KPS = Karnofsky Performance Status; CPS = clinical prediction of survival; WBC = white blood cell count

## Survival Probabilities Associated With the Palliative Prognostic (PaP) Score

<table>
<thead>
<tr>
<th>TOTAL PaP SCORE</th>
<th>RISK GROUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5.5</td>
<td>A: 30-day survival probability &gt;70%</td>
</tr>
<tr>
<td>5.6–11.0</td>
<td>B: 30-day survival probability 30%–70%</td>
</tr>
<tr>
<td>11.1–17.5</td>
<td>C: 30-day survival probability &lt;30%</td>
</tr>
</tbody>
</table>

Maltoni et. al, JPSM 1999;17:240-247
Glare et. al, JPSM 2001;22:891-898
Fast Fact 124

Reproduced from Glare P. Clinical Predictors of Survival in Advanced Cancer (Tables 5a and 5b). *Support Oncol.* 2005;3(5):337. ©2013 *Journal of Supportive Oncology*. Reproduced with permission. All rights reserved.
Leading Causes of Mortality (2010)

1. Cardiac disease
2. Cancer
3. Respiratory Disease
4. Stroke
5. Accidents
6. Dementia
7. Diabetes
8. Influenza and Pneumonia
9. Renal disease
10. Suicide
Quiz Time!

62 yo with Class IV heart disease, COPD, DM, and CRF admitted to ICU with ventricular dysrhythmias. EF = 40%, FEV1 = 40%, Cr-1.5

Would you refer this patient to hospice?

1. Yes, cardiac disease
2. Yes, COPD
3. Yes, diabetes
4. Yes, debility
5. No
Physiology of CHF

- **Systolic** – 2/3 CAD, 1/3 valvular disease, DM, Hypertension, thyroid, alcoholism and myocarditis
- **Diastolic** – CAD and Hypertension
  - 50% CHF over 70 yo Dilated ventricles
- **Symptoms** – fatigue and dyspnea
- **Maladaptive neurohormonal response**
- **TNF and IL-6** cause proteolysis and wasting, similar to cancer pt

Journal of Cardiac Failure, vol 13, No 7 2007
Cardiovascular Disease

- Cachexia
- Depression
- Multiple admissions
- Co-morbidities – DM, PVD, renal, dementia
- Age > 70
- Poor functional status
- HR > 100, Cr >2, inc sustained BNP
- LV volume > 85 mm (20% 2 year survival)

Palliation in heart failure, Davis, AJHPM 2005: 22, 211
Cardiovascular Disease

- Recent cardiac hospitalization (3 x 1 yr mortality)
- Elevated creatinine >1.4
- SBP <100 or tachycardia > 100 (2 x 1 yr mortality)
- LVEF < 40%
- Ventricular dysrhythmias
- Anemia
- Hyponatremia
- Cachexia
- Reduced functional state
- Co-morbid illnesses

Fast Fact Concept #143
Arrhythmias

Although arrhythmias are common in patients with heart failure and are indicators of disease severity, they are not powerful independent predictors of prognosis.
CHF – Prediction Models

- **CVM-HF PREDICTOR - EFFECT**
  - Am J Cardiol 2006;98:1076-1082
  - [http://www.ccort.ca/CHFriskmodel.asp](http://www.ccort.ca/CHFriskmodel.asp)
  - Predicts death at 30 days and one year

- **SEATTLE HEART STUDY**
  - Predicts 1, 2, 3 year survival with and w/o meds

Download both to laptop or mobile device
**EFFECT Heart Failure Mortality**

### Conventional (U.S.) units Score

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Score Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
</tr>
<tr>
<td>Respiratory Rate (breaths/min) (minimal 20; maximal 45)</td>
<td></td>
</tr>
<tr>
<td>Systolic blood pressure (mmHg)</td>
<td>Select one</td>
</tr>
<tr>
<td>Blood Urea Nitrogen (maximal, 60 mg/dL)</td>
<td></td>
</tr>
<tr>
<td>Sodium Concentration &lt;136 mEq/L</td>
<td>Yes, No</td>
</tr>
<tr>
<td>Cerebrovascular Disease</td>
<td>Yes, No</td>
</tr>
<tr>
<td>Dementia</td>
<td>Yes, No</td>
</tr>
<tr>
<td>COPD</td>
<td>Yes, No</td>
</tr>
<tr>
<td>Hepatic Cirrhosis</td>
<td>Yes, No</td>
</tr>
<tr>
<td>Cancer</td>
<td>Yes, No</td>
</tr>
<tr>
<td>Hemoglobin &lt;10.0 g/dL (not required for 30-day Score)</td>
<td>Yes, No</td>
</tr>
</tbody>
</table>

### 30-Day Score

<table>
<thead>
<tr>
<th>Score Range</th>
<th>30-Day Mortality Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 60</td>
<td>0.4</td>
</tr>
<tr>
<td>61-90</td>
<td>3.4</td>
</tr>
<tr>
<td>91-120</td>
<td>12.2</td>
</tr>
<tr>
<td>121-150</td>
<td>32.7</td>
</tr>
<tr>
<td>&gt; 150</td>
<td>59.0</td>
</tr>
</tbody>
</table>

### One-Year Score

<table>
<thead>
<tr>
<th>Score Range</th>
<th>One-Year Mortality Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 60</td>
<td>7.8</td>
</tr>
<tr>
<td>61-90</td>
<td>12.9</td>
</tr>
<tr>
<td>91-120</td>
<td>32.5</td>
</tr>
<tr>
<td>121-150</td>
<td>59.3</td>
</tr>
<tr>
<td>&gt; 150</td>
<td>78.8</td>
</tr>
</tbody>
</table>
Seattle Heart Model
Biomarkers in Heart Disease

- Troponin – myocardial cell damage
- BNP – LV dysfunction
- Cystatin C – renal function
- CRP – inflammation

Increased risk of death when all four elevated

NEJM – 5/2008 Zethelius

- Others - TNF, IL-6, IL-1, Fas (APO-1), endothelin-1, NE, troponin-1, Na

Biomarkers in Heart Failure, NEJM, Vol 358;2148-2159
Prognostication in Cancer

- **Performance or functional status**
  - Karnofsky Score < 50%, ECOG >2
- **Solid tumor, KS 50% - average 3-months**
- **Signs and symptoms**
  - Anorexia
  - Confusion or delirium
  - Dysphagia
  - Dyspnea
- **Biomarkers** – Ca-125, Ca 19-9, Ca 27.29, Ca 15-3
Prognostication in Cancer

- Hypercalcemia (exceptions breast CA and Multiple Myeloma) – 2 months
- Carcinomatous meningitis – 2-3 months
- Malignant pleural effusion
- Pericardial effusion – 2-3 months
- Liver metastasis
- Brain metastasis 2-6 months
Quiz Time!

62 yo with COPD, 2 episodes of pneumonia over the past year, 10 lb weight loss (BMI 19), who is hospitalized because of increasing dyspnea. FEV1 is 30% and O2 sat on room air is 86%. What do you think this pt’s life expectancy is?

A. < 6 months
B. 6-12 months
C. >12 months
COPD - Prognosis

BODE – point system

- Body Mass Index (BMI < 21)
- Obstruction – FEV1
- Dyspnea scale (MMRC)
- Exercise capacity – 6 min distance walked

Better predictor than FEV1 alone, but still not predictive of 6-month prognosis

http://www.icumedicus.com/clinical_criteria/bode.php
NEJM, 2004 150 (10) 1005-1012
COPD -- Prognosis

- Hansen – Flaschen Criteria
  - Best FEV1 < 30% predicted
  - Increasing dependence on caregivers
  - Activity limited to a few steps
  - Depression
  - Single
  - Recurrent hospitalization within the previous yr
  - Associated chronic comorbid illness

Respiratory Care January 2004, 49 (1) 90-98
COPD - Prognosis

- Hansen – Flaschen Criteria
  - Best FEV1 < 30% predicted
  - Increasing dependence on caregivers
  - Activity limited to a few steps
  - Depression
  - Single
  - Recurrent hospitalization within the previous yr
  - Associated chronic comorbid illness

Respiratory Care January 2004, 49 (1) 90 -98
Acute Ischemic Stroke (85% CVA’s)

- 5% hospital mortality
- 17 to 21% 90 day mortality
- Medical complications in the hospital increase the mortality rate
- NIHSS and age – strongest predictors
Hemorrhagic Stoke (15% CVAs)

- 52% 30 day mortality
- 90% 30 day mortality if a brainstem bleed
- Volume of the bleed
  - < 30 cc’s – 20% mortality
  - 30 to 60 cc’s – 100% with Rankin Score > 4
    – Unable to walk or any ADL’s without assistance
  - >60 cc’s – 90+% mortality

Mitka, JAMA 2007; 297 (23) 2573
Quiz Time!

86 yo WF with Fast Stage 6 dementia who falls at the NH and fractures a hip. Post op she is stable, eating about 20%. A hospice consult is requested. Would you admit this woman to hospice and under what diagnosis?

1. Yes, dementia
2. Yes, debility
3. No
Prognosis in Dementia

- FAST 7c
  - 39.5% mortality in 6 mo (poor selectivity)
  - 22.2% who died had FAST 7c (poor sensitivity)

Excluded a substantial portion of patients who died in 6 months – 77.8%
Mortality Risk Index

- Retrospective study based on MDS
- Better outcome predictor than FAST scale
- Assesses 12 risk factors and assigns points
- Use in nursing home population

# Mortality Risk Index (2004)

Score Sheet to Estimate 6-Month Prognosis in Nursing Home Residents With Advanced Dementia

<table>
<thead>
<tr>
<th>Risk Factor From Minimum Data Set</th>
<th>Points</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities of Daily Living Scale = 28*</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Male Sex</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Oxygen Therapy Needed in Prior 14 Days</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Shortness of Breath</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>&lt;25% of Food Eaten at Most Meals</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Unstable Medical Condition</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Bowel Incontinence</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Bedfast</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Age &gt;83 y</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Not Awake Most of the Day</td>
<td>1.4</td>
<td></td>
</tr>
</tbody>
</table>

**Total Risk Score, Rounded to Nearest Integer**

Possible Range, 0-19

*The Activities of Daily Living Scale is obtained by summing the resident’s self-performance ratings on the Minimum Data Set for the following 7 functional activities: bed mobility, dressing, toileting, transfer, eating, grooming, and locomotion. In the Minimum Data Set, functional ability is rated on 5-point scale for each activity (0, independent; 1, supervision; 2, limited assistance; 3, extensive assistance; and 4, total dependence). A total score of 28 represents complete functional dependence.*

<table>
<thead>
<tr>
<th>If Total Risk Score is...</th>
<th>Risk Estimate of Death Within 6 Months, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8.9</td>
</tr>
<tr>
<td>1 or 2</td>
<td>10.8</td>
</tr>
<tr>
<td>3, 4, or 5</td>
<td>23.2</td>
</tr>
<tr>
<td>6, 7, or 8</td>
<td>40.4</td>
</tr>
<tr>
<td>9, 10, or 11</td>
<td>57.0</td>
</tr>
<tr>
<td>≥12</td>
<td>70.0</td>
</tr>
</tbody>
</table>


Copyright restrictions may apply.
Mortality Risk Index - Dementia

Complete dependence with ADLs  1.9
Male Gender                  1.9
Cancer                       1.7
CHF                          1.6
Oxygen therapy past 14 days  1.6
SOB                          1.5
<25% po intake               1.5
Unstable medical condition   1.5
Bowel incontinence           1.5
Bedfast                      1.5
Age > 83 yo                  1.4
Sleeps most of the day       1.4
Mortality Risk Index

Risk of estimate of death in 6 months

- 0 pts  8.9 %
- 1-2    10.8 %
- 3-5    22.2 %
- 6-8    40.4 %
- 9-11   57.0 %
- > 12   70.0 %

Prognosis in Dementia

- Hospitalized with pneumonia
  - 53% 6-month mortality vs. 13% cognitively intact

- Hospitalized with hip fracture
  - 55% 6-month mortality vs. 12% cognitively intact

Morrision RS JAMA 2000;264:47-52
Liver Disease

- PT > 5 or INR > 1.5
- Serum albumin < 2.5 gm/dl

And at least one of these

- Ascites
  - refractory to treatment
  - spontaneous bacterial peritonitis (1 yr survival – 30%)
  - hepatorenal syndrome
  - hepatic encephalopathy
  - recurrent variceal bleeding
Liver Disease

- Calculate MELD score (Model ES Liver Dz)
  - INR
  - Bilirubin
  - Creatinine

Liver – MELD Scores
3 Month Mortality (Hospitalized)

<table>
<thead>
<tr>
<th>MELD Score</th>
<th>Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 9</td>
<td>4</td>
</tr>
<tr>
<td>10-19</td>
<td>27</td>
</tr>
<tr>
<td>20-29</td>
<td>76</td>
</tr>
<tr>
<td>30-39</td>
<td>83</td>
</tr>
<tr>
<td>≥ 40</td>
<td>100</td>
</tr>
</tbody>
</table>

MELD – Na – better predictor of those with heptocellular carcinoma (over MELD)

Kamath 2001
92 yo with frailty, weight loss (90 lbs), recent history of pneumonia, mild dementia, DM, PVD and CRF. Albumin – 2.0, Cr – 1.9, Hgb – 10.5. Patient resides in NH and is seen by PC. Would you refer this pt to hospice; if so diagnosis?

1. Yes, renal disease
2. Yes, dementia
3. Yes, FTT
4. Yes, debility
5. No
# Chronic Renal Failure

<table>
<thead>
<tr>
<th>Stages</th>
<th>GFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 slight</td>
<td>&gt; 90ml/min</td>
</tr>
<tr>
<td>2 mild</td>
<td>60-89</td>
</tr>
<tr>
<td>3 moderate</td>
<td>30-59</td>
</tr>
<tr>
<td>4 severe</td>
<td>15-29</td>
</tr>
<tr>
<td>5 end stage</td>
<td>&lt;15 diabetics</td>
</tr>
<tr>
<td></td>
<td>&lt;10 non diabetics</td>
</tr>
</tbody>
</table>

**Hemodialysis withdrawal**

**Median survival** = 9.6 days, 32% > 2 weeks
Renal Disease

- Not seeking dialysis or renal transplant
- \( \text{Cr cl} < 10 \, \text{cc/min} \) (15 cc/min with DM) or \( \text{Cr} > 8 \, \text{mg/dl} \)
- Albumin < 3
- Co-morbid conditions
  - PVD, especially amputation
  - CHF
  - DM
- Malnutrition
- Age > 80 years old
Renal Disease

- Albumin < 3.5
  - 50% - 1 year survival
  - 17% - 2 year survival
Mortality Trends

- Cause of mortality
  - age
  - diagnosis
  - ICD-9 codes (most common 56 codes)
  - country
  - plots trends over time
In Summary

Would you be surprised if this patient died within the next year?

Lynn, 2005
Documentation – Paint the Picture

- Primary illness - maximally treated
- Co-morbidities
- Secondary conditions
- Nutritional
- Functional Rate of decline
- Cognitive
- ADLs
- Infections
- Signs and symptoms/supporting labs
“Of course you don’t feel any better. Two years ago I gave you a six months to live. You do the math.”
Prognostication

Questions ?

jbull@fourseasonscfl.org