## **Evidence Based Medical Prognostication**

# Prognostication Made Easy – Sometimes

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# Disclosures

- National Hospice and Palliative Care Organization (NHPCO)
- Coalition for the Advancement of Palliative Care (CAPC)
- MCE CME for Primary Care
- Family Medicine Education Consortium (FMEC)
- Goldblatt IT Systems



# Award Winning Community-Based Palliative Care

- 1. Circle of Life Award Citation of Honor 2010
- 2. Circle of Life Award Winner 2012
- 3. SB1004 Medicaid Palliative Medicine California
- 4. NAACO Innovators Award Winner 2017
- 5. Certificate of Distinction Joint Commission 2018
- 6. Jefferson Hearst Population Health Winner 2019





SHARP. Hospice Care

# What makes our community based palliative care program so unique?

We do not wait for patients to be hospitalized or piggy backed off of home health, therefore our patients may never see the inside of the hospital and do not need to be homebound. As well, we would consider preventing a readmission a failure because the patient never should have been admitted in the first place.

> "We have let economics define our ethics instead of ethics defining our economics" Daniel Hoefer, M.D.



## Hippocratic physicians of ancient Greece prized the skill of prognostication above all others.

It is "a most excellent thing for the physician to cultivate Prognosis; for by foreseeing and foretelling...the present, the past and the future, and explaining the omissions which patients have been guilty of, he will be more readily believed to be acquainted with the circumstances of the sick, so that men will have the confidence to intrust themselves to such a physician"

Citation by Ray Porter in The Greatest Benefit to Mankind



"Why has there been so little research on individual prognosis in the terminal period? One explanation is that doctors unconsciously need the uncertainty to justify to themselves their actions for an individual patient..."

The Lancet, May 25, 1985





Social Science & Medicine, The Ellipsis of Prognosis In Modern Medical Thought; vol 4-1, No. 3



# Diagnosis and Treatment vs. Diagnosis, Treatment and Prognosis



# Why should we prognosticate?

To be sure that the treatment path is consistent with the goals of care.

To move away for the the outdated model of reactive care to proactive care.

Far more cost effective – primary and secondary costs.



#### 343 doctors

- Estimates on 468 terminally ill patients
- Mean patient survival 24 days
- Considered accurate if estimate within 33% for any given patient
- > 20% of the time accurate
- 80% of the time inaccurate
  - 63% over-optimistic
  - 17% over-pessimistic

The average over-optimistic estimate was off by 530%

British Medical Journal; Vol 320 (7233)



No significant difference for:
Sex
Board certification
Self rated physician optimism
Number of hospice referrals in the past year
Number of medically similar patients in the past year
Specialty

British Medical Journal; Vol 320 (7233)



Negative correlation with accurate prognostication:
Longevity of doctor-patient relationship
Longer the time since the last visit

Positive correlation with accurate prognostication:> Upper quartile of physician experience

British Medical Journal; Vol 320 (7233)



The only group more overly optimistic than healthcare providers are patient and families.



# How do we represent ourselves?

Terminal cancer patients

- 37% gave frank estimates of survival
- 28% knowingly overestimated
- 12% knowingly underestimated
- 23% declined to respond

Annals of Internal Med 2001:139 pp.1096-1105



There are 3 types of prognostication:

1.Time – how long until an event occurs

2.Event – what is the next event in the expected series of events?

3. Probability – how likely is that event to occur?



With training how good are doctors at the different types of prognostication?

- Time Poor
- Event Good
- Probability Good



The reason doctors are poor prognosticators is because we lack training and perseverate about time prognostication!



# Before You Start Prognosticating: Transitions Program

What is the Main Diagnosis?

Is it Late Stage?



# Has the Patient had Maximum Medical Therapy?

Medicare Critieria:

- Truly no other treatment to provide in a "traditional pathway"
- 2. Patient is intolerant to further treatment
- 3. Patient refuses further treatment or chooses a different pathway.
- 4. Patient is so noncompliant they are repeatedly hospitalized.



<u>Pearl</u> – The More Tools you use to prognosticate, the more accurate you can be.

# "More is More"



# **General Prognostic Data**

- 1. Age
- 2. Male
- 3. BMI
- 4. Weight Loss
- 5. Depression
- 6. Frailty Syndrome



Biometric models + functional decline patterns + specific biological data + general biological data + adjusting for your personal tendencies = accurate, effective, professional and compassionate information.



# **Biometric Models: Examples**

- NYHA Class CHF
- BODE Pulmonary
- MELD Liver
- SEER Cancer
- ECOG Cancer
- FAST Dementia



Medicare Hospice LCD's

# **4 Basic Functional Decline Patterns:**

- 1. Sudden Death
- 2. End-Organ Disease
- 3. Cancer
- 4. Debility (Frailty/Dementia)



# **Patterns of Functional Decline**





Lunney, J. R. et al. JAMA 2003;289:2387-2392

# **ADL End-Organ vs. Cancer**



Journal of Palliative Medicine, Dying Trajectory in the Last of Life: Does Cancer Trajectory Fit other Diseases, Vol 4, no 4, 2001 pp. 457-464



# Pearl:

End organ disease patients, 6 months prior to death are:

- 1. Alert and oriented
- 2. Ambulatory
- 3. Not in pain



# **Population Studies**

#### Six annual interviews

6070 patients with at least one interview after the fourth annual follow-up with severe disability and without evidence of previous severe disability. Severe disability – disability in 3 or more ADLs Catastrophic severe disability – no previous ADL dysfunction Gradual severe disability – previous disability in 1 or 2 ADLs

In the year for which severe disability developed:

72.1% chance of hospitalization for catastrophic severe disability48.6% chance of hospitalization for gradual severe disability22.3% chance of hospitalization for patients with some disability14.3% chance of hospitalization for patients with no disability

JAMA, Hospital Diagnoses, Medicare Charges, and Nursing Home Admissions in the Year When Older Persons Become Severely Disabled, March 5, 1997, Vol 277, no. 9 pp.728-734



# Biological Data – Disease Specific and non-specific

- 1. Absolute level
- 2. Progression of Markers



# **Time Prognostication**

Never say, "I would be surprised if you were here in six months."

Do say, "If I had 100 people in your situation, this is what the medical information says the bell curve would look like."



Event Prognostication – Prognostication which guides the patient in an expected series of events.



#### **Anticipatory Guidance**

Age (mos)	0-1	2	4	6	9	12	16	24
Diet	Breast/bottle		Solids Reaching walkers	Finger foods	Wean bottle/ reduced appetite		Healthy diet	
Safety	Car seat (all) Fever/signs of illness Shaking (0-6 mos) scalds (all) Passive smoke (all)	rolling		Choking/poison Crawling baby proofing Water safety (6-24 mos) Sun screen	prev	climbing Brush teeth		
Behavior	Sleep (all)	crib talk to baby	Supine bot Hands in mouth	stranger anx	exploring	Disci- pline/ tantrums		toileting



#### Karnofsky Performance Status Index

#### General Category

Able to carry on normal activity; no special care needed.

Unable to work, able to live at home and care for most personal needs, varying amount of assistance needed.

Unable to care for self, requires institutional or hospital care or equivalent, disease may be rapidly progressing.

#### Index

#### Specific criteria

- 100 Normal no complaints; no evidence of disease.
- 90 Able to carry on normal activity; minor signs or symptoms of disease.
- 80 Normal activity with effort, some signs or symptoms of disease.
- 70 Cares for self, unable to carry on normal activity or to do work.
- 60 Requires occasional assistance from others buy able to care for most needs.
- Requires considerable assistance from others and frequent
- 50 medical care.
- 40 Disabled, requires special care and assistance.
- 30 Severely disabled, hospitalization indicated, death not imminent.
- 20 Very sick, hospitalization necessary, active supportive treatment necessary.
- 10 Moribound.
- 0 Dead.



				CHF
				82 Year old male
				Co-managed with specialist
				Functional Decline
				Progressive decline SOB
Test	Result	Flag	Reference	Slow rise in ADL decline

#### **Result History**

	21 Jan 11	13 Dec 10	25 Mar 10	28 May 09	02 Dec 08	17 June 08	07 May 07	07 Nov 06
	8:43 am	8:00 am	9:47 am	8:11 am	8:07 am	8:43 am	8:33 am	7:57 am
BNP	1270	631	386	103	173	111	170	148





#### **Results History**

	21Jan2 011	13Dec2 010	25Mar2 010	29Dec2 009	28May 2009	02Dec2 008	17Jun2 008	07May 2007	12Feb2 007	07Nov 2006
	8:43 AM	8:00 AM	9:47 AM	8:52 AM	8:11 AM	8:07 AM	8:43 AM	8:33 AM	8:02 AM	7:57 AM
Sodium	144	142	142	145	141	143	142	143	139	142
Potassium	4.4	4.4	4.7	4.3	4.6	4.8	4.8	4.5	5.1	4.4
Chloride	106	104	104	106	105	105	105	107	105	106
Carbon Dioxide	31	29	31	31	33	29	31	30	29	30
BUN	44	44	48	17	26	19	23	11	30	16
Creatinine	1.5	2.0	1.9	1.1	1.2	1.1	1.1	1.0	1.2	1.2
Calcium	9.9	9.6	9.8	9.4	9.4	9.5	9.5	9.0	9.5	9.2

Glucose Non-\*107 Fasting



#### Results History

	13Dec2010	25Mar2010	29Dec2009	28May2009	02Dec2008	07Nov2006
	8:00 AM	9:47 AM	8:52 AM	8:11 AM	8:07 AM	7:57 AM
WBC	8.4	6.5	8.0	7.9	8.3	8.3
Hgb	012.5	12.0	12.6	13.1	13.4	14.4
He	t 37.9	37.5	38.2	39.1	40.1	42.7
Platelet	t 199	210	182	179	189	171
Rdw For SRS	13.5	14.0	13.4	13.2	13.3	12.3
MCV	93	92	93	90	90	90
RBC	24.08	4.09	4.11	4.33	4.44	4.76
MCH	[31	29	31	30	30	30
MCHC	233.0	32.0	33.0	33.5	33.4	33.7
MPV	6.5	6.9	6.2	6.8	6.3	7.6





\*Cholesterol less than 150 in men 63% mortality at 14 months

\*\* Worst 1 year prognostic marker + Low cholesterol, low albumin, low hemoglobin = 84% 1 year mortality

Hoefer, Daniel, M.D

#### Development and Preliminary Evaluation of an Innovative Advanced Chronic Disease Care Model

Daniel R. Hoefer, MD, Suzi K. Johnson, MPH, RN, and Miriam Bender, PhD, RN

JCOM September 2013 Vol. 20, No. 9, 408-418

#### CLINICAL INVESTIGATIONS

# Effect of a Home-Based Palliative Care Program on Healthcare Use and Costs

J. Brian Cassel, PhD,\* Kathleen M. Kerr, BA,<sup>†</sup> Donna K. McClish, PhD,<sup>‡</sup> Nevena Skoro, MPH,<sup>§</sup> Suzanne Johnson, RN, MPH,<sup>¶</sup> Carol Wanke,<sup>#</sup> and Daniel Hoefer, MD\*\*

J Am Geriatr Soc. 2016 Nov;64(11):2288-2295. doi: 10.1111/jgs.14354. Epub 2016 Sep 2



**Hospital Costs Per Month** 





# **Non-Hospital Costs Per Month**

\$7,000	Includes outpati durable medical services. Does no	Includes outpatient care, home health, transportation services, diagnostic services, durable medical equipment, injectable drugs, chemotherapy agents, and professional services. Does not include hospice care nor Transitions costs.								
\$6,000	Schuces. Does no	e merade nospree care n								
\$5,000	P=.319	P=.08	P=.09	P=.002						
\$4,000										
\$3,000	\$2.082									
\$2,000	\$1,393	\$1,605	\$1,690 \$1,306	\$1 291						
\$1,000 \$0		\$1,108		\$649						
ΨŪ	Cancer	COPD	HF	Dementia						
Transitions Comparison										



# **Total Healthcare Costs Per Month**



Does not include hospice care nor Transitions costs



# Percent in Hospital at Least Once in Evaluation Period





# **Percent Dying in Hospital**





### Mean healthcare costs per patient per month

178 Transitions pts enrolled for at least six months prior to death and 515 matched comparison patients. Does not include hospice or Transitions program costs.



Month prior to death (p-value)



# **Program Costs Compared to Costs Avoided**

- Average of \$642 per patient per month cost of providing Transitions services.
- → We then added those to the cost of care per month for the Transitions group.
- → Net savings per patient per month:
  - Cancer: \$4,258
  - COPD: \$4,017
  - CHF: \$3,447
  - Dementia: \$2,690

Brumley RCT 2007 (CHF, Ca, COPD): \$4,535 net savings per patient per month in 2014 dollars\*

\* Brumley RD, Enguidanos S, Jamison P, et al. Increased satisfaction with care and lower costs: results of a randomized trial of in-home palliative care. J Am Geriatr Soc 2007;55:993-1000.



# **Transitions' Patients Use of Hospice**

	Cancer	COPD	HF	Dementia
% using hospice	89.2%	90.8%	84.4%	87.0%
Median days from hospice enrollment to death	15	39	44	46



# **Participant Perceptions**

% Responding "Very good". N=354.



Would recommend Transitions to others Assistance received when problems occurred Effective reducing hospitalizations and ER visits Improvement in quality of life Assisted with care planning and advance directives Taught to contact Transitions team re: symptoms

Taught to manage meds & symptoms





