



"IF ONLY SOMEONE HAD WARNED US"

How to recognize pre-terminal patients and the potential harms caused by continuing traditional care.


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No Disclosures



Cardiac Case Study



Chief Complaint

86 Year old female comes in to see you for passing out after picking something up off the ground while walking her poodle in the backyard. She has stable substernal discomfort with exertion as well. She is occasionally light headed



History of Present Illness

Known AS for 10 years; now with dyspnea walking across a room with a cane and ankle edema. Has a FWW but "never uses it". Feels generally more fatigued, weaker and has lost 12 pounds over the last year due to change in appetite. Work up for weight loss was unrevealing. Denies palpitations. 2 stents placed 7 years earlier for CAD. H/O DM, Htn, CAD, a-fib and mild diastolic failure. She also is being treated for gout, moderate osteoarthritis pain and depression. She has a BMI of 21. She is generally inactive and rarely gets out because she is "not up to it." She states she hasn't had the energy she used to for years. Does not smoke or drink.



Description - Continued

She has lived with her daughter and son-in-law for 2 years. Both work. Does not drive, cook or pay bills. She is mildly demented with a MMSE of 22, 6 months ago. Her family states that she is just a little forgetful. She wears glasses (20/100 without) and hearing aids (when she remembers). Daughter states she needs more help since she is losing her strength.

Previous Surgical History

- TAH
- Lap chole
- ORIF with stage 3 heel ulcer (resolved) and delirium



Medication Table

ASA	325mg	Oxybutynin	5mg bid
Atorvastatin	10mg	Paxil	20mg
Metoprolol	50mg bid	Flexeril	10 mg qhs
Lisinopril	20mg	Hydrocodone	5/325 tid prn
Digoxin	0.250mg	Ibuprofen	600mg tid
Metformin	500 bid	Tylenol PM	
Allopurinol	300mg	MVI	
Furosemide	20mg	Potassium ER	20meq
Aricept	5mg qd	Pantoprazole	40mg



Vitals

Vitals: BP 100/50, HR 52, RR 16, Temp 97.8

Alert and oriented but easily distracted. No JVD at 90 degrees. Heart is irregular with a 2/6 SEM at the RSB, Lungs are CTA with diminished AE. Abd is soft, NT and NABS. No HJR. No focal neuro deficit. +1 bilateral ankle/le edema.

CXR - Poor inspiration but NED

ECHO - Mod Severe AS, diastolic failure, mild decrease in LVF.

EKG; a fib with HR 54



Lab Data

Abnormal for hemoglobin 11.2, total chol 110 (was 150 the previous year)/ LDL 43 (was 65), pro-BNP 537, albumin 3.3, BUN 24/Cr 0.7, hgbA1c 6.0

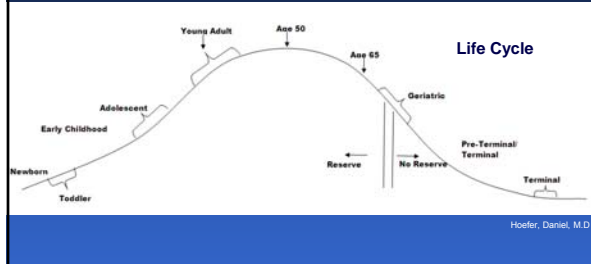


A Decision is made to consider surgery after an angiogram is obtained.

Before you proceed...
Here are some questions to ask.



Up to Date: Physiology and Goals of Care for the Pre-terminal Populations are Not the Same as a Younger and Healthier Geriatric Patient



Identifiers of a Pre-terminal patient:

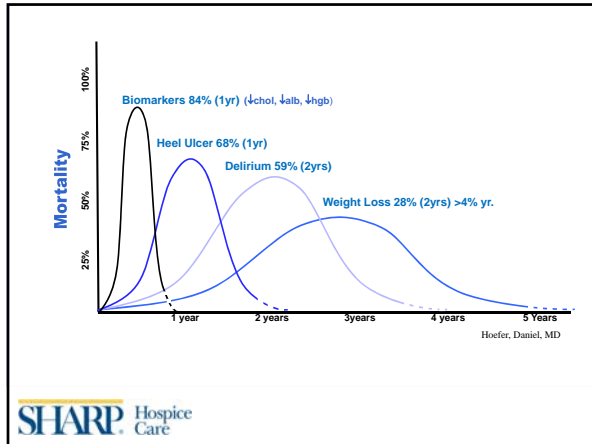
Weight loss (Wallace, JAGS 1995) – 2 year follow up
No loss 11%
Involuntary loss 28%
Voluntary loss 36%

Heel ulcer (Malik, JAMDA 2013) – 1 year
Stage 1 or 2, 55%
Stage 3 or 4, 70%
All stages without vascular intervention 68%
All stages with vascular intervention 59%

Delirium (multiple articles)
30% at 3 mo. to 78% at 34 mo.

Biomarkers (Verdery 1991 J of Gerontology)
84% 1 year mortality for patients with low cholesterol (<160) plus low albumin and hemoglobin versus 7% if none were low. For stable custodial patients.





Other Risk Factors for this patient:

- Cognitive Decline
- Depression
- Social Isolation
- Polypharmacy

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What is this patient's biggest concern?

How much does the patient's cardiac condition really play into her health status?

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Do providers want to know what stage of advanced age their patient belongs to?



This patient's risk of developing hospital induced delirium is:

- a. 23%
- b. 33%
- c. 53%
- d. 63%
- e. 83%



Inouye, Sharon, MD, *Risk Factors for Delirium at Discharge*, Arch Intern Med 2007; 167(13)

Incident delirium

Risk Factors:

1. Dementia
2. Vision worse than 20/70
3. Functional Impairment
4. High comorbidities
5. Any Restraint

0-1 Low
2-3 Intermediate
4-5 High



	Delirium	Death or NH Placement
Low risk	4%	15%
Intermediate	18%	39%
High	63%	64%

Table 4. Predictive Model for the Risk of Delirium in Hospitalized Older Patients

Risk factor
Cognitive impairment (inability to think, concentrate, reason, remember, formulate ideas)
Elevated blood urea nitrogen/serum creatinine ratio (greater than 18)
Severe illness (APACHE score greater than 16, or nurse rating of severe)
Vision impairment (corrected near vision worse than 20/70 in both eyes)

Interpretation: 0 points = low risk (10% chance of developing delirium); 1 or 2 points = intermediate risk (25% chance of developing delirium); 3 or 4 points = high risk (80% chance of developing delirium). APACHE = Acute Physiology and Chronic Health Evaluation (clinical.com/lowMortality/APACHEII.aspx). Information from reference 3.

American Academy of Family Physicians August 1, 2014 Volume 90 Number 3

It is important to recognize who might develop delirium because delirium is associated with all of the following long term consequences except:

1. Delirium is only associated with short term but not long term consequences
2. Higher mortality
3. Longer lengths of stay
4. Higher rates of Readmissions
5. Permanent functional decline
6. Permanent Cognitive decline
7. Higher rates of institutionalization

Pathophysiology (cont.)

- 2. Aberrant stress response
 - a. Inflammation (baseline increase with age, infections)
 - i. Increase in pro-inflammatory cytokines and altered prostaglandins (IL1, IL2, IL6, TNF, Interferon)
 - b. Sickness behavior response
 - i. Limbic-hypothalamic-pituitary-adrenal response

MacLulich, Alasdair MJ, et al, *Unraveling the Pathophysiology of Delirium: A focus on the role of Aberrant Stress Responses*, Journal of Psychosomatic Research, 2008; 65: 229-38



NEJM Cognitive Decline Post Cardiac procedure 2012

- 60 years of age or older
- Statistically significant decrease in MMSE scores at 12 months for status post operative cardiac procedures $p < 0.001$
- 31% vs. 20% : delirious vs. non delirious patients
 $p = 0.055$

Saczynski, Jane, PhD, et Al. *Cognitive trajectories after post operative delirium 2012*, NEJM 367(1):30-39



Wacker, Priscilla, et al, *Post-Operative Delirium is Associated with Poor Cognitive Outcomes and Dementia*, Dement Geriatr Cogn Disord 2006; 21:221-27

Is delirium the precursor for dementia?

For this study – no pre-existing cognitive, hearing or visual deficit known Hip or Knee replacement

Fracture – 60% developed delirium
Elective Repair – 24.6% developed delirium.

5 year prospective Study

Results: **Patients who developed delirium were 1050% (10.5 times) more likely to have developed dementia than those who did not.**



Table 1. Studies That Assess the Association Between Delirium and Long-Term Cognitive Outcomes

Study	N	Population	Study design	Follow-up period	Delirium measure	Cognitive outcome measure	Findings
Reynolds and Emswiler, 1989	76	Acute postoperative hospitalized patients	Prospective	1 year	Clonal Rating	Dr-TuT	Cognitive deterioration associated with delirium observed in 89% of patients at 1 year follow-up
Prattis and Edgar, 1993	239	General hospitalized medical patients	Descriptive	2 years	Chart review, clinical interview, MDSE	Modified Telephone MDSE	Delirium in MDSE score in patients with delirium correlated to results
Rockwood, 1998	203	General hospitalized medical patients	Prospective	1 year	DSST, MDSE, Clinical Judgment, CDT	MDSE, Revised Dementia Rating Scale, Category-Function Interview	Delirium was associated with increased delirium at follow-up
Delis et al., 2000	82	Hip replacement surgery	Prospective	2 years	Chart review, proxy interview using a modified version of the CASP	MDSE	Patients with delirium were more likely to have cognitive impairment at 2 year follow-up
Robinson et al., 2000	11	Community-dwelling adults hospitalized for acute delirium	Prospective	2 years	DSM-IV criteria	Neuropsychological battery	Patients had higher than expected delirium recurrence rates over 2 years
McCluskey et al., 2001	111	Medical patients	Prospective	1 year	CASP	MDSE	Patients with delirium had lower MDSE scores at 1 year follow-up compared to controls
Kane et al., 2001	102	Residential care patients	Prospective	1 year	Chart + interview	MDSE, Brief-16, Selective Packaging Test, Simple Test, Visual Perception	Patients who develop delirium within the context of a study of illness assessment greater cognitive decline
Robinson et al., 2001	188	Community-dwelling patients	Prospective	3 years	Telephone interview, chart or interview, chart review	MDSE, ADL, IADL, Chart Review	Increased risk for new diagnosis of delirium among "older old"
Robinson et al., 2001	34	Medical ICU patients	Prospective	8 weeks	CASP-ICU*	Comprehensive neuropsychological battery	No significant association between delirium duration and cognitive outcomes

*Dr-TuT = Dr-TuT in Brief-16 sub-domain
 DSST = Dementia Rating Scale
 MDSE = Modified Telephone MDSE
 CASP = Confusion Assessment Method
 CASP-ICU = Confusion Assessment Method
 ADL = Activities of Daily Living
 IADL = Instrumental Activities of Daily Living
 CASP-ICU = Confusion Assessment for the Intensive Care Unit

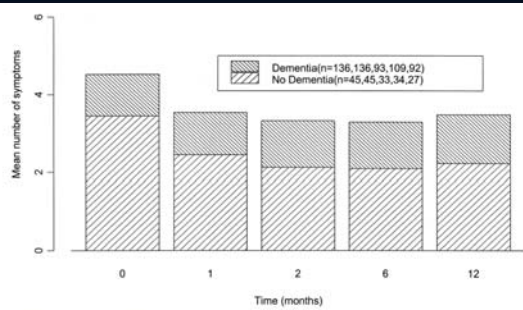


FIGURE 1. Mean number of delirium symptoms at baseline and follow-up in demented and non-demented patients.

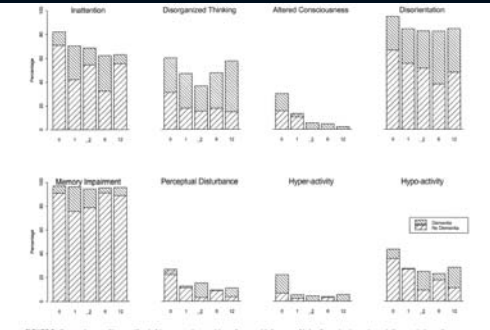


FIGURE 2. Percentage with specific delirium symptoms of baseline and follow-up. Note: Sample sizes of each time point are the same as those in Figure 1.



George, James, et al. *Causes and Prognosis of Delirium in Elderly Patients Admitted to a District General Hospital, Age and Ageing* 1997; 26: 423-27

1 year risk - OR

Mortality 2.30

Institutionalization 4.53

Readmission 2.05



Marcantonio, Edward, MD, SM, et al. *Delirium Is Independently Associated with Poor Functional Recovery After Hip Fracture*, JAGS, 2000; 48(6)

Delirium occurred in 52 of 126 patients
After adjusting for risk factors delirium was associated with poor functional outcomes at 1 mo

ADL decline OR - 2.6

Decrease in ambulatory ability OR - 2.6

Death or Nursing Home Placement OR - 3.0

< 50% of patients returned to their pre-fracture level of function.
Followed for 6 months.



Terri R Fried MD, et al. *Understanding the Treatment Preferences of Seriously Ill Patients*, NEJM 2002; 346: 1061-66

For advanced illness patients, 74.4% and 88.8%, of patients would forgo treatment if the treatment burden was low but the probability of severe functional impairment or cognitive impairment was high.

This compares to 98.7% of patients who would want treatment in the treatment burden was low and they were more likely to return to their previous level of function.

Mortality was not the major determinant in patient choice.

n=279

Patients' had no cognitive or functional deficits in this study.



Salkeld, G et al, *Quality of life related to fear of falling and hip fractures in older women: a time trade off study*, BMJ 2000; 320(7231): 341-46

Of women surveyed (>74 year of age) 80% would rather be dead than experience the loss of independence and quality of life that results from a bad hip fracture and subsequent admission to a nursing home.



This patient has an anticholinergic burden score of:

1. 0
2. 3
3. 6
4. 9
5. >12
6. What is an anticholinergic burden score?

...and why do we care?



Delirium is directly related to the number of medicines prescribed and the number of drug-drug interactions.

Drug Class or Variable	Reference(s)	Relative Risk of Delirium
Type/class of drug		
Sedative-hypnotic drugs	29-31	3.0-11.7
Narcotics	30-33	2.5-2.7
Anticholinergic drugs	29, 33, 34	4.5-11.7
Any psychoactive drug	35	3.9
Number of drugs		
≥2 psychoactive drugs	18	4.5
Adding >3 drugs in 24 hours	18	4.0
2-3 drugs	27	2.7
4-5 drugs		9.3
≥6 drugs		13.7

Inouye, Sharon K, et al, *Delirium: A Symptom of How Hospital Care is Failing Older Persons and a Window to Improve Quality of Hospital Care*, Am J Med 1999; 106: 565-73



Medication Table

ASA	325mg	Oxybutynin	5mg bid
Atorvastatin	10mg	Paxil	20mg
Metoprolol	50mg bid	Flexeril	10 mg qhs
Lisinopril	20mg	Hydrocodone	5/325 tid prn
Digoxin	0.250mg	Ibuprofen	600mg tid
Metformin	500 bid	Tylenol PM	
Allopurinol	300mg	MVI	
Furosemide	20mg	Potassium ER	20meq
Aricept	5mg qd	Pantoprazole	40mg



Evidence-Based Advanced Illness Medication List

ASA	81mg	Nitroglycerin	SL prn
Metoprolol	50mg bid	Allopurinol	?
Lisinopril	10mg	Anti Depressant	?
Tylenol or hydrocodone TID (no prn)		Ducosate	?



Stopping Statins in the last Year of Life:

1. 381 patients
 - a. 189 stopped statins and 191 continued
 - b. 49% Cancer Patients 51% non-CA
 - c. Primary and secondary prevention
 - d. Median time to death
 - i. Off - 229 days
 - ii. On - 190 days
 - iii. Trend
 - e. Statistically significant improvement in QOL scores off statins
 - f. Less symptoms off statins and \$712 dollars less per patient.

Abernethy AP, Kutner, Blatchford PJ: Managing comorbidities in oncology: A multisite randomized controlled trial of continuing versus discontinuing statins in the setting of life-limiting illness. ASCO Annual Meeting, Abstract LBA9514. Presented June 3, 2014.

2. 84% 1 year mortality for stable custodial nursing level patients for patients with chol <150, low hemoglobin and low albumin (versus 7% if no markers present)

Verdery 1991 J of Gerontology



Side Effects of SSRIs in the Advanced Elderly
 Falls with Fracture: HR fracture 2.1, OR Falls 2.2 (Arch Int Med 2007, 106:188-940)

Worse risk of fracture than with glucocorticoids or PPIs: 19% of postmenopausal women will fall twice after starting an SSRI per year with a statistically significant increase in fractures (J Bone Miner Res 2012, 27(5): 1186-95)

Upper Gastrointestinal and post-surgical bleeding (J Clin Psych 2010, 71(12): 1565-75): doubles the risk of UGIBs and possible increase bleeding associated with surgical procedures

Hyponatremia: (Ann Pharmacother 2006; 40(9):1618-622)



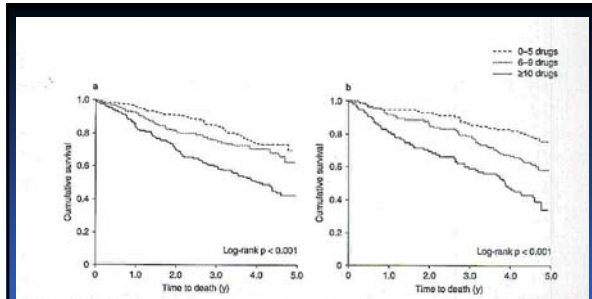
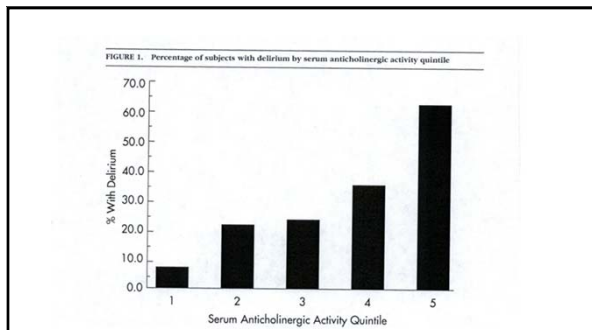


Fig. 1. Kaplan-Meier survival curves for excessive polypharmacy (ten or more drugs), polypharmacy (six to nine drugs) and non-polypharmacy (five or fewer drugs) groups in (a) the first phase (n=501, aged >75 years) between 1999 and 2002 and (b) the second phase (n=330, aged >80 years) between 2002 and 2007.

Jrykka, J. et al, Polypharmacy Status as an Indicator of Mortality in an Elderly Population, Drugs and Aging 2009; 26: 1039-48



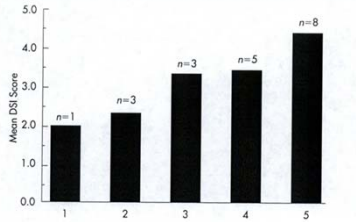


Flacker, J. et al, The Association of Serum Anticholinergic Activity With Delirium in Elderly Medical Patients, Am J Geriatr Psychiatry 1998; 6:31-41



Anticholinergic Activity and Delirium

FIGURE 2. Delirium Symptom Interview (DSI) score and serum anticholinergic activity quintile



Flacker, J. et al. *The Association of Serum Anticholinergic Activity With Delirium in Elderly Medical Patients*. *Am J Geriatr Psychiatry* 1998; 6:31-41



Using prognostic modeling, this patient's post hospital risk of functional decline is:

1. 15%
2. 25%
3. 35%
4. 45%
5. 55%



We **can** identify the at risk population for functional decline and provide statistical information:

Developmental Cohort n=448
Validation cohort n=379

3 Risk Factors Identified

1. Increased age
2. Decreased MMSE
3. IADL deficiency

(IADLS – Managing Finances, Taking Meds, Using the phone, Shopping, Transportation deficit, Preparing meals, deficient housework)

Sager, Mark A MD, et al. *Hospital Admission Risk Profile (HARP): Identifying Older Patients at Risk of Functional Decline Following Acute Medical Illness*, *JAGS*, 1996;44(3): 251-57



TABLE 3 – Scoring of the Risk Profile: Relationship Between Significant Predictor Variables and Loss of ADL Function for the Development Cohort (n = 448)

Patient Characteristic	Parameter Estimate	Risk Score
Age		
<75 (n = 128)	reference	0
75-84 (n = 232)	668	1
≥ 85 (n = 87)	1.24	2
Abbreviated MMSE*		
15-21 (n = 349)	reference	0
0-14 (n = 99)	562	1
Pre-admission IADL function †		
6-7 (n = 210)	reference	0
0-5 (n = 238)	965	2

* Abbreviated Mini-Mental State Exam, range 0-31

† Number of independent instrumental activities of daily living before admission.



Risk of long term functional decline

	Development	Validation
Low (0-1)	17%	19%
Intermediate (2-3)	28%	31%
High (4-5)	56%	55%



This patient has how many characteristics of geriatric Frailty Syndrome? And why should we care?

- 1. 1:5
- 2. 2:5
- 3. 5:5
- 4. 3:8
- 5. 6:8



Adapted by the American Geriatric Society

Frailty has a Phenotype: Requires 3 or more of 5 clinical features

1. Loss of strength
2. Weight loss (unintended)
3. Low activity level/increased sleeping
4. Poor endurance or easily fatigued
5. Slowed performance/unsteady gait



What is Frailty?

“Physiologic syndrome, characterized by decreased reserve, and diminished resistance to stressors, resulting from cumulative decline across multiple physiologic systems, and causing vulnerability to adverse outcomes.”

— The American Geriatric Society

Lack of physiologic reserve
Frailty is progressive
It is independent of other medical disease

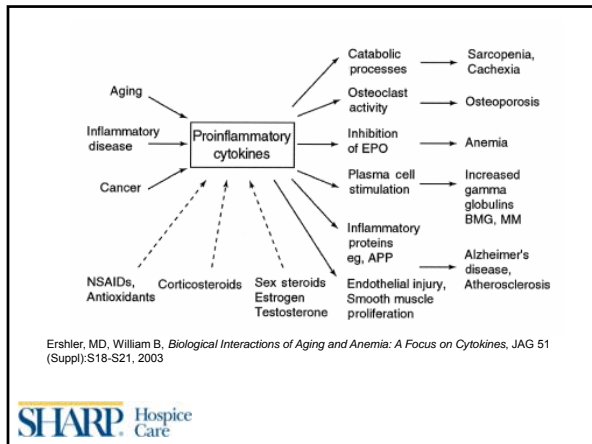
Boockvar, Kenneth S MD, MS et al, *Palliative Care for Frail Older Adults*, JAMA 2006 Vol 296(18), pp 2245-53

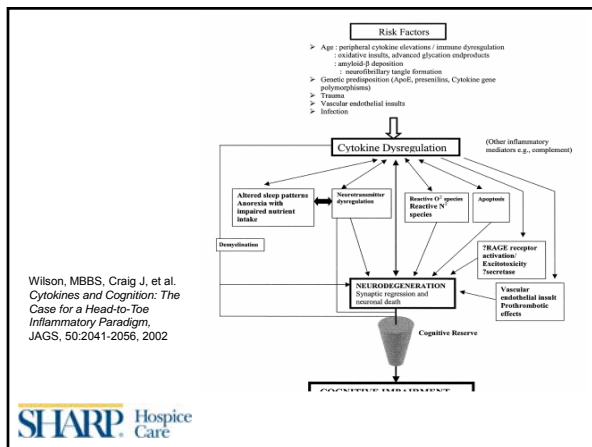


Pathophysiology of this Syndrome

1. Loss of Skeletal muscle mass – “Sarcopenia”
 - a. Rate of muscle loss accelerates after ages 50 and 75
 - b. May also involve visceral protein loss (albumin)
2. Neuroendocrine dysfunction
 - a. Hormones associated with frailty: low estrogen, low testosterone, low growth hormone, low IGF 1 (insulin growth factor), DHEA, cortisol
3. Chronic Inflammation
 - a. Increased levels of proinflammatory cytokines; IL6, c-reactive protein







Frailty As A Predictor of Surgical Outcomes

LOS for Major Procedures	
No Frailty	4.2 days
Intermediate	6.2 days
Frail	7.7 days

Surgical Complications Major Procedures	
No Frailty	19.5%
Intermediate	33.7%
Frail	43.5%

Martin A Makary, MD, MPH, *Am Coll Surg*. 2010 Jun;210(6):901-8. doi: 10.1016

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Discharge Disposition (Assisted Living or SNF)

Minor Procedure	
No Frailty	0.8%
Intermediate	0%
Frail	17.4%
Major Procedure	
No Frailty	2.9%
Intermediate	12.2%
Frail	42.1%

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This patient's risk of "Hospital Associated Disability (HAD)" is:

1. 53%
2. 63%
3. 73%
4. 83%
5. What is HAD?...and why should we care?

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"Hospital-Associated Disability"

- Defined as loss of 1 ADL needed to live independently without assistance
- Occurs in 30% of persons over age 70 – frail patients have higher risk
- Occurs even if the illness is successfully treated and has no direct relationship to the illness
- **Less than 50% of patients with HAD have recovered to pre-illness levels at 1 year**

"Hospital-Associated Disability", 2011 Covinsky, K E, et al, JAMA 306(16):1782

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Prognosis with HAD:

- 41% died at 1 year
- 29% Remained disabled
- 30% returned to preillness levels



Predictive model for developing hospital associated disability:

Risk Factors:

1. Decubitus Ulcer RR-2.7
2. Cognitive Impairment RR-1.7
3. Functional Impairment RR-1.8
4. Low Social Activity Level RR-2.4



Total Risk Factors	Probability of Developing HAD (Validation Cohort)
0	6%
1 – 2	29%
3 – 4	83%

Inouye, Sharon MD, MPH, et al. A Predictive Index For Functional Decline in Hospitalized Elderly Medical Patients, 1993 Journal of Intern Med :645-652



Preoperative evaluation 2012 guidelines ACS and AGS.



Surgical System wide Palliative Consultation and Frailty Screening:
Ernst, KF, et al, *Surgical Palliative Care Consultations Over Time in Relationship to System wide Frailty Screening*, 2014 JAMA Surg

33% reduction in 180-day mortality (p<0.001) even after controlling for age, frailty or whether the patient had surgery if the patient receives a (physician led) palliative consultation.



(Circulation. 2012;125:1928-1932.)
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Circulation is available at <http://circ.ahajournals.org>
DOI: 10.1161/CIRC.0b013e318242173

Decision Making in Advanced Heart Failure
A Scientific Statement From the American Heart Association
Endorsed by Heart Failure Society of America, American Association of Heart Failure Nurses, and Society for Medical Decision Making

Table 1. Top Ten Things to Know

1. Shared decision making is the process through which clinicians and patients share information with each other and work toward decisions about treatment chosen from medically reasonable options that are aligned with the patients' values, goals, and preferences.
2. For patients with advanced heart failure, shared decision making has become both more challenging and more crucial as duration of disease and treatment options have increased.
3. Difficult discussions now will simplify difficult decisions in the future.
4. Ideally, shared decision making is an iterative process that evolves over time as a patient's disease and quality of life change.
5. Attention to the clinical trajectory is required to calibrate expectations and guide timely decisions, but prognostic uncertainty is inevitable and should be included in discussions with patients and caregivers.
6. An annual heart failure review with patients should include discussion of current and potential therapies for both anticipated and unanticipated events.
7. Discussions should include outcomes beyond survival, including major adverse events, symptom burden, functional limitations, loss of independence, quality of life, and obligations for caregivers.
8. As the end of life is anticipated, clinicians should take responsibility for initiating the development of a comprehensive plan for end-of-life care consistent with patient values, preferences, and goals.
9. Assessing and integrating emotional readiness of the patient and family is vital to effective communication.
10. Changes in organizational and reimbursement structures are essential to promote high-quality decision



(Circulation, 2012;125:1928-1952.)
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Circulation is available at <http://circ.ahajournals.org>
DOI: 10.1161/CTR.0b013e318242173

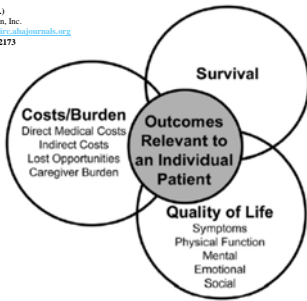


Figure 2. Prognosis is not only about expectations for survival. There are multiple domains that are of varying importance to individual patients. Adapted from Spilker.³⁸

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Test your Palliative Knowledge:

For the case study patient, all of the following have been shown to improve quality of life. Place these issues in order of decreasing benefit when treated appropriately on prolonging life and describe how you would achieve that goal:

- Cholesterol management
- Depression management
- Pain management
- Social isolation prevention

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There is altered physiology and different psychosocial needs in the advanced elderly than at a younger and healthier time in the lifespan. Medicine must do a better job advancing the construct for which healthcare is practiced as that construct has not keep up with the technological advances of the industry. As a result, technologic advances are not yet optimizing patient centered goals.

Daniel R. Hoefer, M.D.

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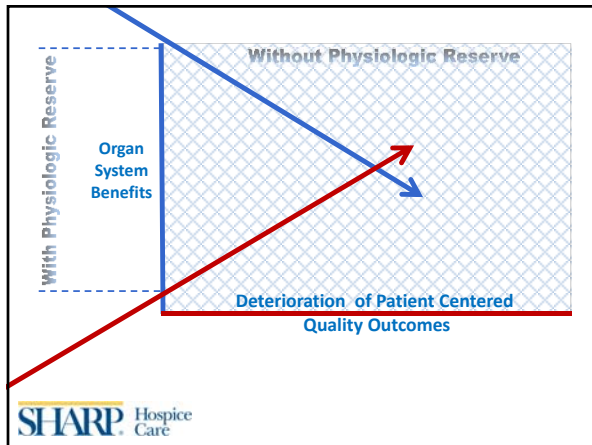
When a patient has lost their physiologic reserve decisions regarding care plans must involve Patient centered quality outcomes (PCQOs) vs Organ system directed interventions (OSDs)

- PCQOs**
1. Worsening Symptoms
 2. Preventing cognitive decline
 3. Preventing Functional decline
 4. Preventing Institutionalization
 5. Not being an emotional and financial burden to the family.

Versus

- OSDs**
1. Improving Symptoms
 2. Improving Function
 3. Maintaining Status





OWNERSHIP

We are not only responsible for the acute outcomes of our patients but the long term consequences of that same care.

By using our professional skill of palliative prognostication we can foresee the risks of the unintended consequences of our care. We can then, at the least, offer them an alternative aggressive patient centered pathway.



Conclusion

The new paradigm: Integrating the Outcome goals of the advanced elderly is possible. Prognostication will be mandatory. Regaining this professional tool and the multiple diverse benefits will improve care for this demographic.

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