

# Frailty: A Specialist's Perspective

Thomas Robinson MD MS

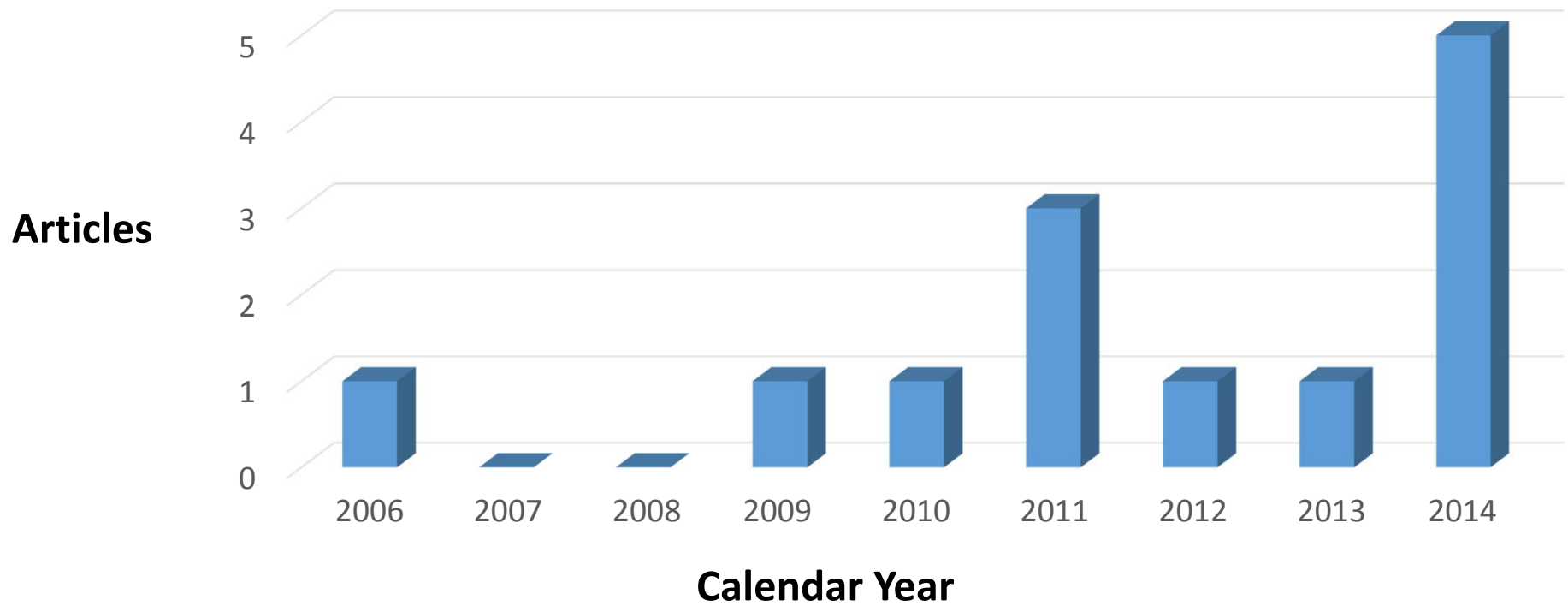
General Surgery

University of Colorado / Denver VA

## Integrating Frailty Research into the Specialties

“We have chosen to focus on [frailty which is a] topic critical to the aging/specialty interface, where the bulk of research has been done in the field of geriatrics, and specialty researchers are actively trying to integrate this [frailty] research into issues pertinent to the specialty population.”

# FRAILITY IN THE SURGICAL LITERATURE



Pubmed search: Title word frailty in Ann Surg, J Am Coll Surg, JAMA – Surg, Am J Surg

# FRAILITY IN THE SURGICAL LITERATURE

## LETTERS

### **Acute Postoperative Frailty**

Luigi Ferrucci, MD, PhD, Marcello Maggio, MD, PhD  
Baltimore, MD

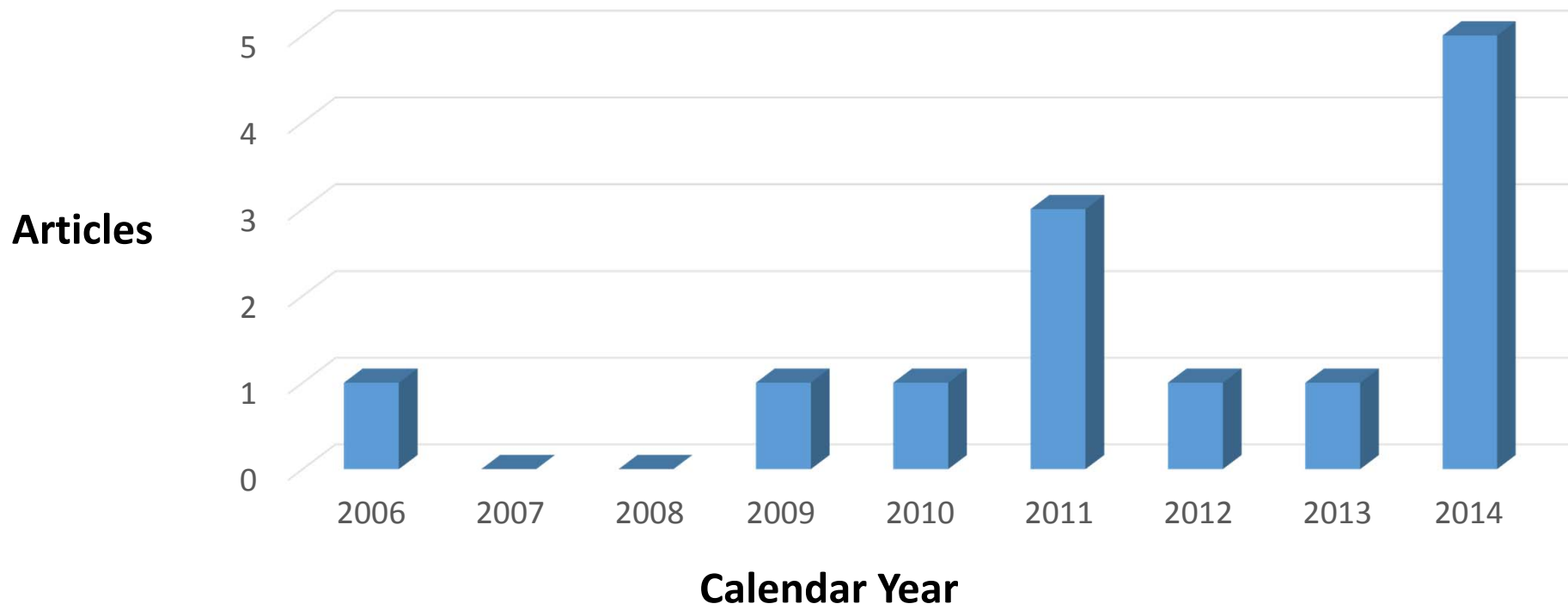
Gian Paolo Ceda, MD, Cesare Beghi, MD,  
Giorgio Valenti, MD  
Parma, Italy

Giuseppe De Cicco, MD  
Brescia, Italy

We read with great interest the article by Dr Wolfe concerning the influence of surgical stress on muscle mass in the elderly. The author underlines that the catabolic re-

terone, sex hormone-binding globulin, and insulin-like growth factor-1 were measured the day before, on the day of the procedure, and 1, 2, 3, and 4 days after operation. We found a substantial decrease in serum insulin-like growth factor-1 levels along with increased levels of cortisol, dehydroepiandrosterone, and estradiol in both men and women. A dramatic drop in serum testosterone levels (< 200 ng/dL, considered a cut-off for hypogonadism) was also observed in older men after operation.<sup>5</sup> Reduction in anabolic hormones such as testosterone and insulin-like growth factor-1 can be explained and can also contribute to an increase in inflammatory cytokines, such as interleukin (IL)-6, tumor necrosis factor- $\alpha$ , IL-1 $\beta$ , a chain of events that can lead to sarcopenia after operation.<sup>2,3</sup> In addition, inflammation plays an important role in muscle catabo-

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# FRAILITY IN THE SURGICAL LITERATURE

## ORIGINAL ARTICLES

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### Redefining Geriatric Preoperative Assessment Using Frailty, Disability and Co-Morbidity

*Thomas N. Robinson, MD,\*† Ben Eiseman, MD,\*† Jeffrey I. Wallace, MD,‡ Skotti D. Church, BS,\*  
Kim K. McFann, PhD,§ Shirley M. Pfister, RN, MS, NP,¶ Terra J. Sharp, NP-C,¶ and Marc Moss, MD‡*

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**Objectives:** (1) Determine the relationship of geriatric assessment markers to 6-month postoperative mortality in elderly patients. (2) Create a clinical prediction rule using geriatric markers from preoperative assessment.

confers increased susceptibility to poor outcomes. Clinical markers of frailty are widely recognized by geriatricians as predictors of poor outcomes. With more than half of all operations in the United States

# TWO APPROACHES TO FRAILTY

## Accumulation of Deficits

- disability
- cognition
- multi-morbidity
- social vulnerability

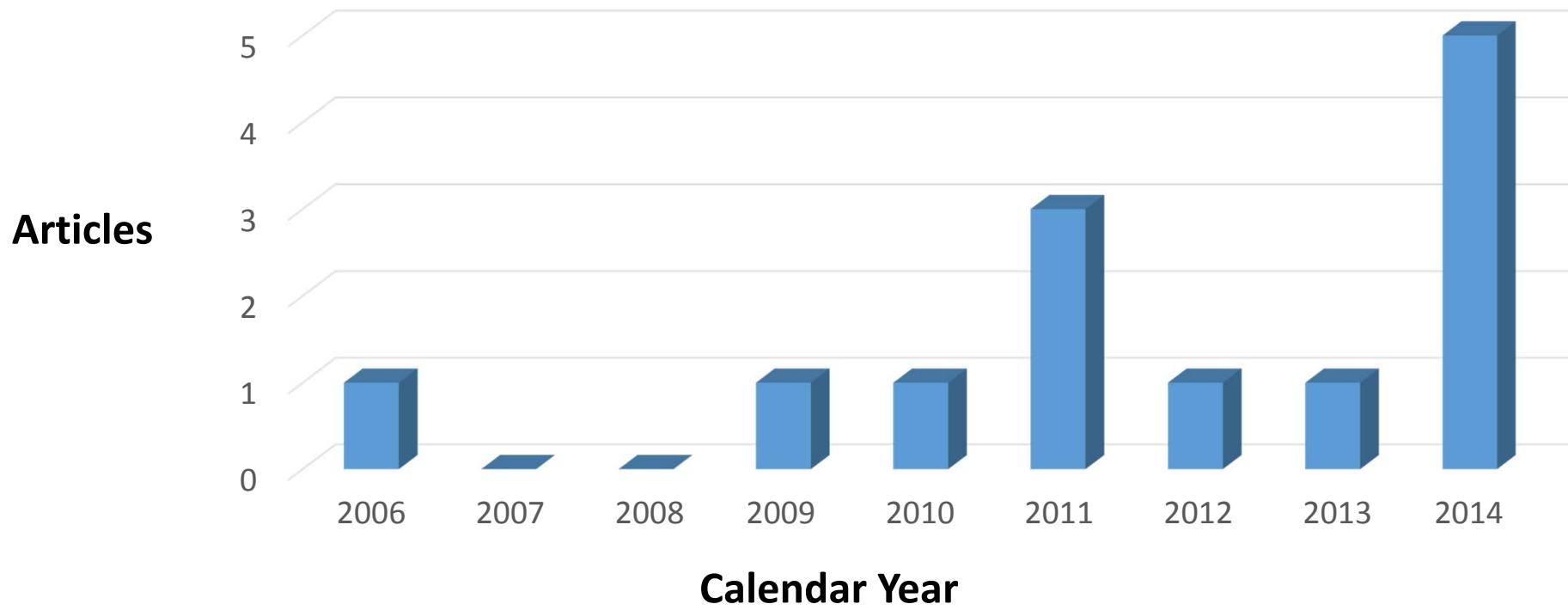
CMAJ 2005;173(5):489-95

## Phenotypic Frailty

- slow walking speed
- impaired grip strength
- self-report of declining activity levels
- unintended weight loss
- exhaustion

J Gerontol A Biol Sci Med Sci 2001;56:M146

# FRAILITY IN THE SURGICAL LITERATURE



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# Frailty in the Surgical Literature

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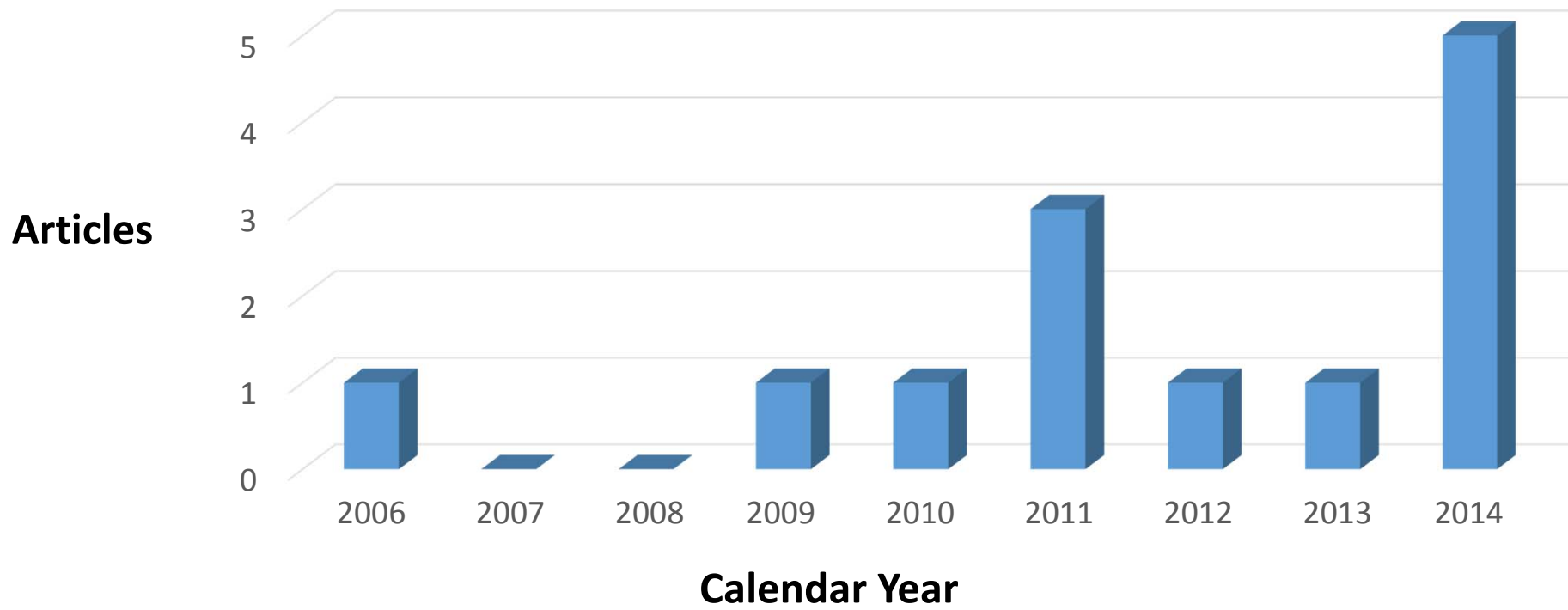
## Frailty as a Predictor of Surgical Outcomes in Older Patients

Martin A Makary, MD, MPH, FACS, Dorry L Segev, MD, PhD, FACS, Peter J Pronovost, MD, PhD, Dora Syin, MD, Karen Bandeen-Roche, PhD, Purvi Patel, MD, MPH, Ryan Takenaga, MD, Lara Devgan, MD, MPH, Christine G Holzmueller, BLA, Jing Tian, MS, Linda P Fried, MD, MPH

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**BACKGROUND:** Preoperative risk assessment is important yet inexact in older patients because physiologic reserves are difficult to measure. Frailty is thought to estimate physiologic reserves, although its use has not been evaluated in surgical patients. We designed a study to determine if frailty predicts surgical complications and enhances current perioperative risk models.

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## Integrating Frailty Research into the Specialties

“Gaps in knowledge remain regarding how to apply these [frailty] principles to specialty research, such as –

- (1) the identification and optimal treatment of frail older adults who are undergoing medical and/or surgical interventions
- (2) the development of additional outcomes (i.e. surgical complications, chemotherapy toxicity) that may be utilized by specialists to identify individuals who are considered frail.”

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# Surgical Risk Calculators - - <http://riskcalculator.facs.org/>

**Procedure**

Begin by entering the procedure name or CPT code. One or more procedures will appear below the procedure box. You will need to click on the desired procedure to properly select it. You may also search using two words (or two partial words) by placing a "+" in between, for example: "cholecystectomy+cholangiography"

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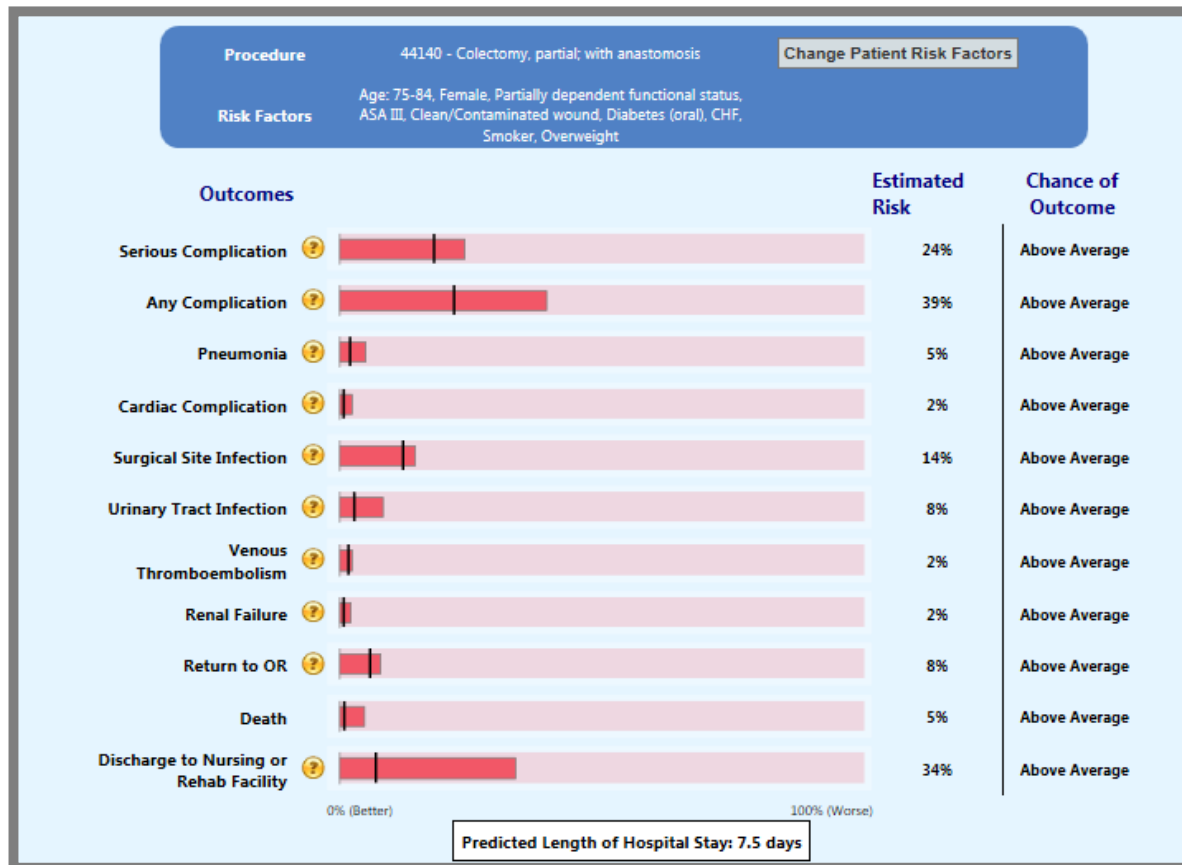
**Are there other potential appropriate treatment options?**  Other Surgical Options  Other Non-operative options  None

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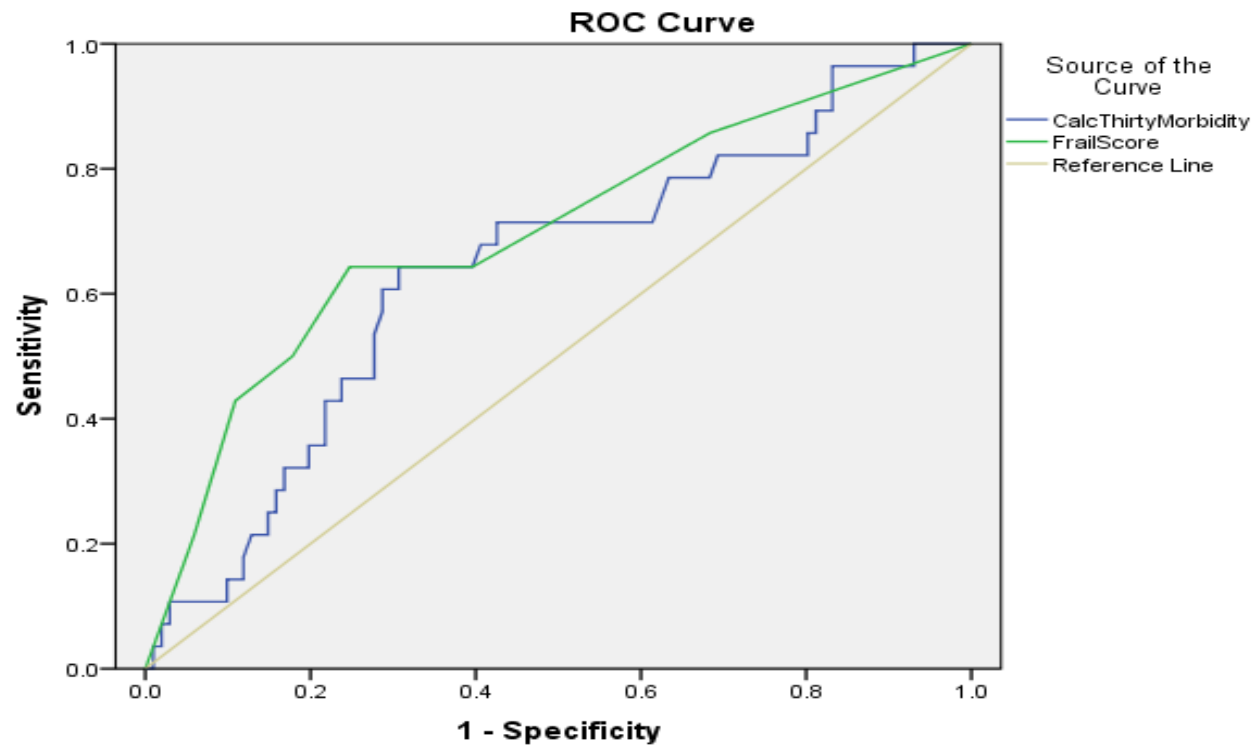
*Please enter as much of the following information as you can to receive the best risk estimates.  
A rough estimate will still be generated if you cannot provide all of the information below.*

Age Group	<input type="text" value="75-84 years"/>	Diabetes	<input type="text" value="Oral"/>
Sex	<input type="text" value="Female"/>	Hypertension requiring medication	<input type="text" value="No"/>
Functional status	<input type="text" value="Partially Dependent"/>	Previous cardiac event	<input type="text" value="No"/>
Emergency case	<input type="text" value="No"/>	Congestive heart failure in 30 days prior to surgery	<input type="text" value="Yes"/>
ASA class	<input type="text" value="III - Severe systemic disease"/>	Dyspnea	<input type="text" value="None"/>
Wound class	<input type="text" value="Clean/Contaminated"/>	Steroid use for chronic condition	<input type="text" value="No"/>
Current smoker within 1 year	<input type="text" value="Yes"/>	Ascites within 30 days prior to surgery	<input type="text" value="No"/>
History of severe COPD	<input type="text" value="No"/>	Systemic sepsis within 48 hours prior to surgery	<input type="text" value="None"/>
Dialysis	<input type="text" value="No"/>	Ventilator dependent	<input type="text" value="No"/>
Acute Renal Failure	<input type="text" value="No"/>	Disseminated cancer	<input type="text" value="No"/>
BMI Calculation:	Height (in) <input type="text" value="68"/>	Weight (lbs) <input type="text" value="184"/>	

# Surgical Risk Calculators - - <http://riskcalculator.facs.org/>



## Receiver Operating Characteristic (ROC) Curve



	AUC	95% CI	p-value
Null	0.500		
Risk Calculator	0.638	0.520, 0.755	0.026
Frailty Score	0.700	0.581, 0.817	<0.001

## CURRENT GEMSSTAR PROJECTS WITH EASY LINKS TO FRAILTY

BOWLING, CHRIST	EMORY UNIVERSITY	Reasons for the Excess Mortality and Functional Decline in Older Adults with CKD
BROWN, CHARLES	JOHNS HOPKINS UNIV	The impact of impaired cerebral autoregulation on postoperative delirium
BRUMMEL, NATHA	VANDERBILT UNIVERSITY	Early Prediction of Long-Term Cognitive Impairment Following Critical Illness
CHAER, RABIH A.	UNIVERSITY OF PITTSBURGH	Effect of Aging and Aortic Wall Behavior as Predictors of Aortic Aneurysm Growth
DODSON, JOHN A	NEW YORK UNIVERSITY	Determinants of fall-related bleeding among older adults with atrial fibrillation
DONOVAN, NANCY	BRIGHAM AND WOMEN'S	Loneliness and biomarkers of Alzheimers disease in clinically normal elderly
GARCIA, JOSE M.	BAYLOR COLLEGE OF MED	The role of ghrelin and the ghrelin receptor GHSR1a in sarcopenia of aging
HSIEH, SHI-JUN	ALBERT EINSTEIN	Intranasal insulin for neuroprotection in elderly cardiac surgery patients
JUMP, ROBIN	CASE WESTERN RESERVE	Colonization resistance and older adults vulnerability to C. difficile infection
KAPOOR, ALOK	BOSTON MEDICAL CENTER	Older Adult Safety in Surgery (OASIS)
KENNEDY, MAURA	BETH ISRAEL DEACONESS	Assess Emergency Department Patients Developing Delirium after Hospital Admission



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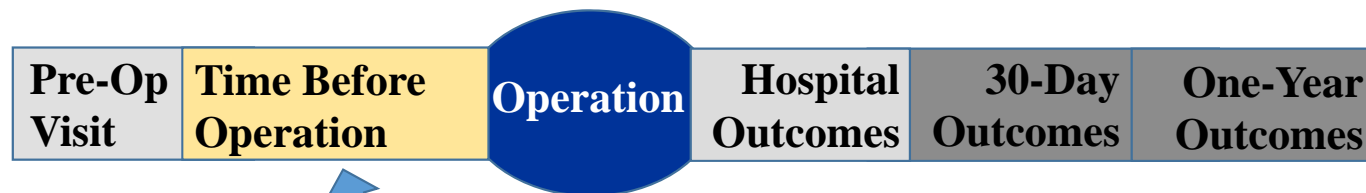
LAI, JENNIFER C.	UNIV OF CA SAN FRANCISCO	Global Functional Status in the Older Liver Transplant Candidate
LEE, RICHARD H.	DUKE UNIVERSITY	Metabolomics of low-trauma fracture among older women with diabetes
MOSELEY, KENDALL	JOHNS HOPKINS UNIVERSITY	Glycemic derangement and osteogenic cells:A model of Premature skeletal aging
RAO, ARATI V	DUKE UNIVERSITY	Clinico-Genomic Assessment of Performance Status in Elderly AML Patients
RIANON, NAHID	UNIVERSITY OF TEXAS HOUSTON	Effects of ACE Inhibitor (ACEI) use on bone turnover in humans: a clinical trial
RONDINA, MATTHEW	UNIVERSITY OF UTAH	The Regulation of Inflammatory Gene Responses in Aging
SAFDAR, NASIA	UNIV OF WISCONSIN-MADISON	Probiotics to Improve Outcomes of Clostridium difficile
SCALES, CHARLES D	DUKE UNIVERSITY	Urinary Dysfunction in the Elderly: Informing Accountable Urologic Care
WILDES, TANYA M	WASHINGTON UNIVERSITY	PILOT STUDY OF GERIATRIC ASSESSMENTS IN SENIOR ADULTS WITH MULTIPLE MYELOMA

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# SHOULD WE START PREVENTING COMPLICATIONS PREOPERATIVELY?



THE INFORMED PATIENT | October 22, 2012, 7:00 p.m. ET

## Need Surgery? You Might Have to Get Healthier First

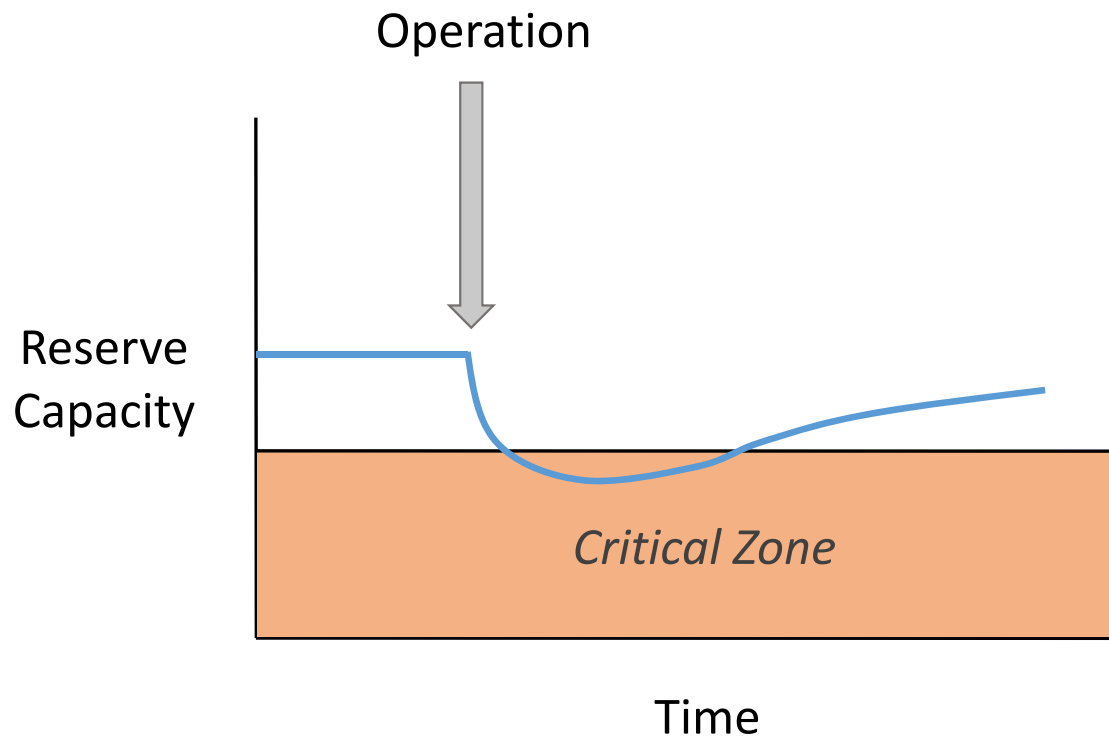
Article | Video | Comments (9)

Email | Print | Save | Facebook | Twitter | Google+ | LinkedIn | A A

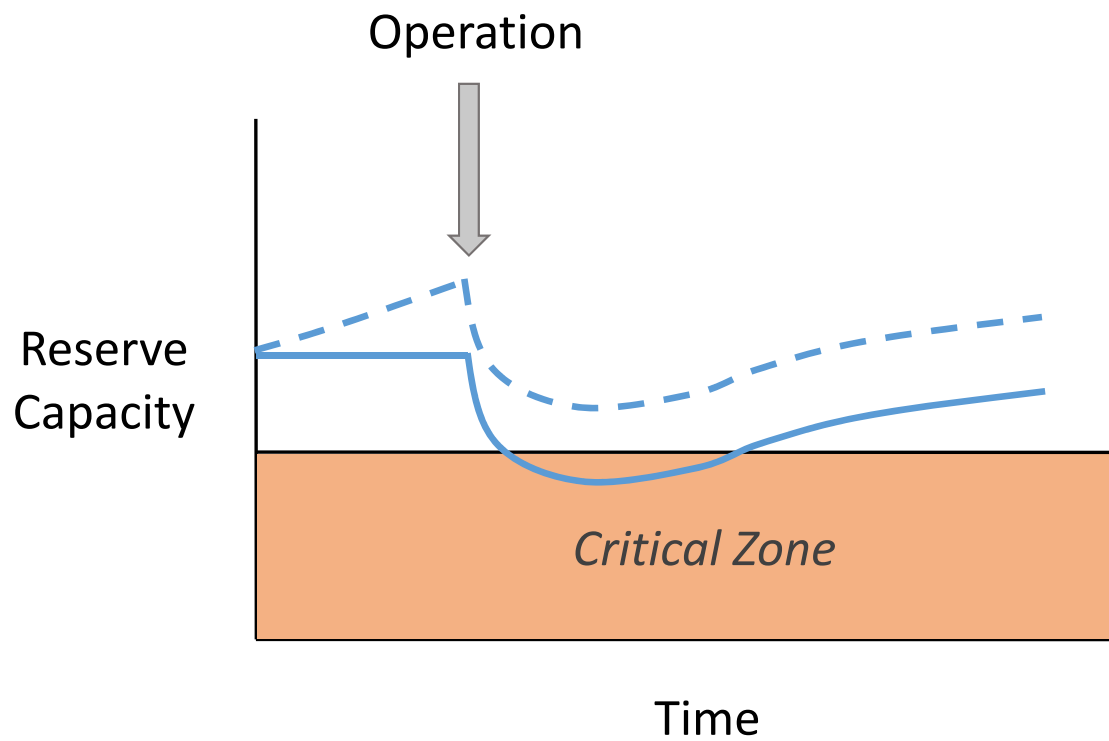
After learning that he needed surgery to remove a golf-ball size tumor in his lung, 67-year-old Doug Rice expected to go under the knife right away. But his doctor told him he'd have to make an important change first: Quit smoking for 2½ weeks to reduce the chance of dangerous complications.

Wall Street Journal Oct 22<sup>nd</sup> 2012.

# THE CONCEPT OF STARTING BEFORE SURGERY TO IMPROVE OUTCOMES



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## STRONG FOR SURGERY

- state-wide initiative bringing pre-surgery checklists to doctors' offices to improve clinical outcomes



Optimize  
nutrition



Smoking  
cessation



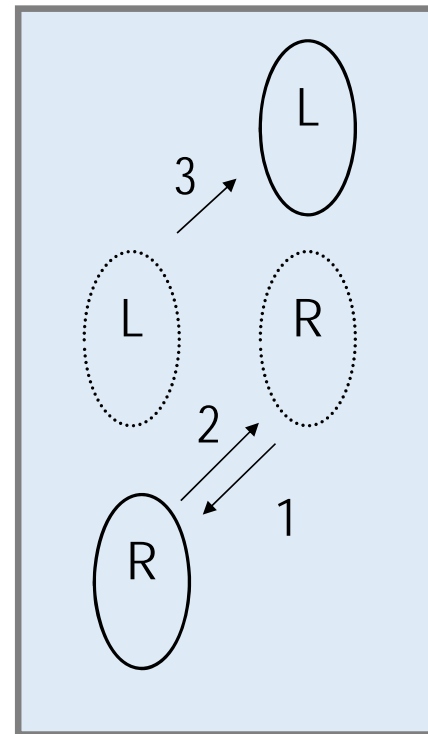
Glucose  
control



Medication  
review

## TRAINING THE FRAIL ELDERLY TO SURVIVE SURGERY

- Log-roll transfer from bed
- Gait training (stairs and curbs)
- Walking patterns
- Motor learning
- Strength training
- Inspiratory muscle training



## CURRENT GEMSSTAR PROJECTS WITH EASY LINKS TO FRAILTY

VERCELES, AVELINO	UNIVERSITY OF MARYLAND BALT	The Multimodal Rehabilitation of Older Ventilated Survivors Of Critical Illness
REGENBOGEN, SCOT	UNIVERSITY OF MICHIGAN	Toward More Effective Enhanced Recovery Protocols for Major Surgery in Older Ad
SCHWARZE, GRETCH	UNIV OF WISCONSIN-MADISON	A communication tool to assist older adults facing difficult surgical decisions

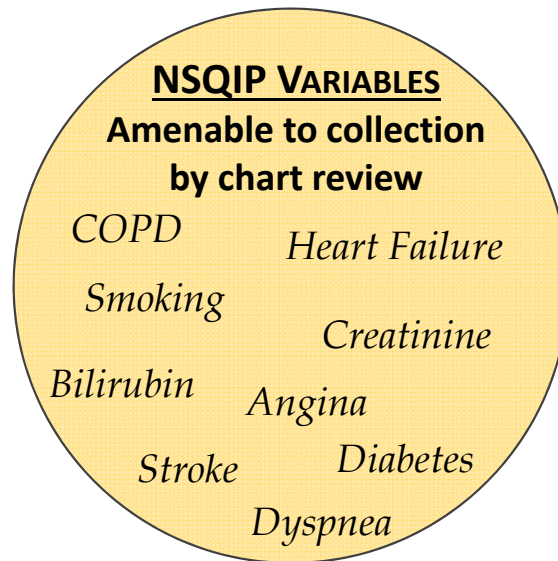


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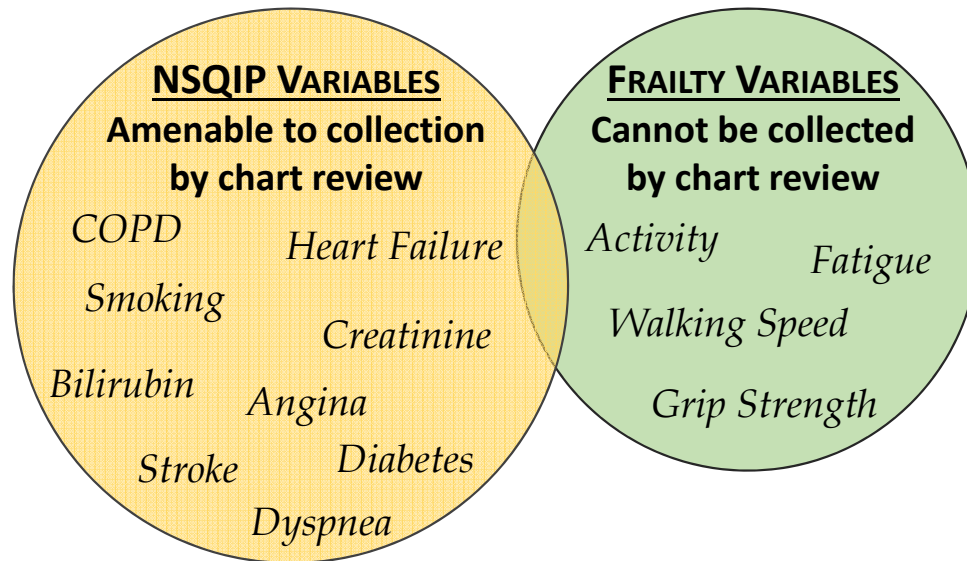
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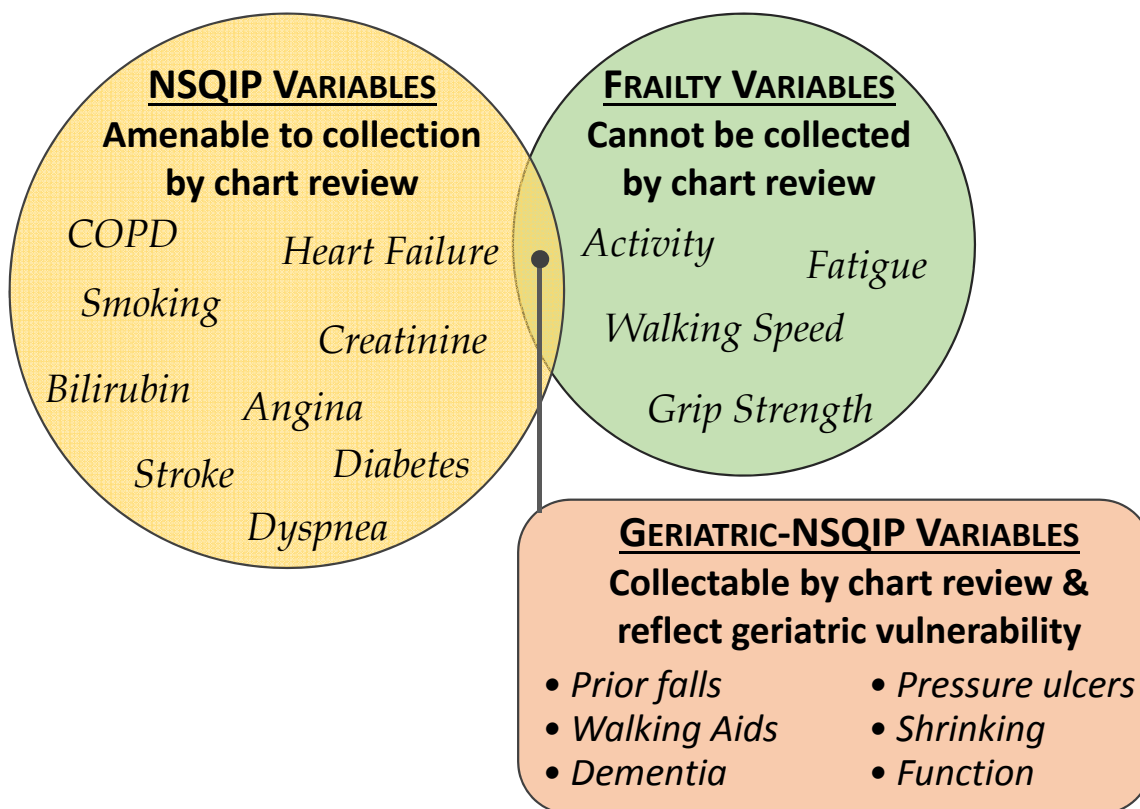
## TAILORING SURGICAL OUTCOMES DATASETS TO OLDER ADULTS



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## TAILORING NSQIP VARIABLES TO THE OLDER ADULT

### Function

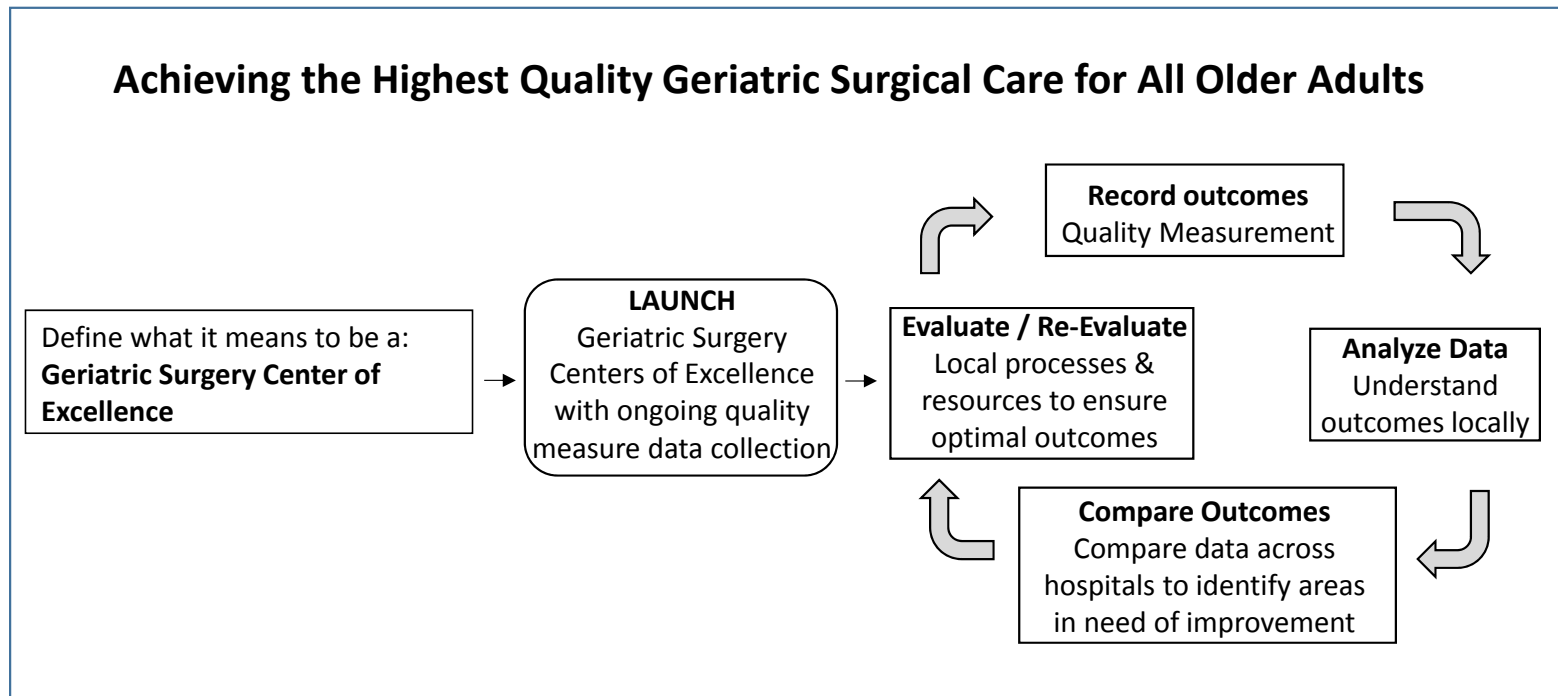
### Mobility

### Cognition

### Healthcare Goals

1. Origin from home with support
2. Discharge functional health status
3. Discharge with / without services
4. Pre-op use of mobility aid
5. Pre-op history of prior falls
6. Postoperative pressure ulcer
7. Fall risk on discharge
8. New mobility aid on discharge
9. History of dementia
10. Competency status on admission
11. Postoperative delirium
12. Palliative care on admission
13. DNR order during hospitalization
14. Postop palliative care consult

# OPERATIONALIZING FRAILTY INTO SURGICAL QUALITY PROGRAMS



## CURRENT GEMSSTAR PROJECTS WITH EASY LINKS TO FRAILTY

COOPER, ZARA	BRIGHAM AND WOMEN'S HOSP	The one year trajectory of elderly patients after cervical spine fracture
DEINER, STACIE	MOUNT SINAI SCHOOL OF MED	The geriatric surgical patient: stress, anesthetics, and functional outcomes
HUGHES, CHRIS	VANDERBILT UNIVERSITY MED	Role of Endothelial and Brain Injury in Acute and Long-term Brain Dysfunction
MANNO, REBECCA	JOHNS HOPKINS UNIVERSITY	The PRESS ERA: Protein & Resistance Exercise Supplement Study for Elderly with RA
VERCELES, AVELINO	UNIVERSITY OF MARYLAND BALT	The Multimodal Rehabilitation of Older Ventilated Survivors Of Critical Illness
REGENBOGEN, SCOT	UNIVERSITY OF MICHIGAN	Toward More Effective Enhanced Recovery Protocols for Major Surgery in Older Ad
PAVON, JULIESSA M	DUKE UNIVERSITY	Adherence to Venous Thromboembolism Prophylaxis Guidelines in Hospitalized Elders