Frailty With CLTI: How Best To Measure It And Can It Improve With Revascularization

VEITH 2024 (5 min)

CV-QED

Center for Quality, Effectiveness, and Outcomes in Cardiovascular Diseases

Disclosures

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- Specific Disclosures
  - –None
- General Disclosures
  - –None

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Seven Ages of Man

All the world's a stage,
And all the men and women merely players,
They have their exits and entrances,
And one man in his time plays many parts,
His acts being seven ages. At first the infant,
Mewling and puking in the nurse's arms.
Then, the whining schoolboy with his satchel
And shining morning face, creeping like snail
Unwillingly to school. And then the lover,
Sighing like furnace, with a woeful ballad
Made to his mistress' eyebrow. Then a soldier,
Full of strange oaths, and bearded like the pard,
Jealous in honour, sudden, and quick in quarrel,
Seeking the bubble reputation
Even in the cannon's mouth. And then the justice
In fair round belly, with good capon lin'd,
With eyes severe, and beard of formal cut,
Full of wise saws, and modern instances,
And so he plays his part. The sixth age shifts
Into the lean and slipper'd pantaloon,
With spectacles on nose, and pouch on side,
His youthful hose well sav'd, a world too wide,
For his shrunk shank, and his big manly voice,
Turning again towards childish treble, pipes
And whistles in his sound. Last scene of all,
That ends this strange eventful history,
Is second childishness and mere oblivion,
Sans teeth, sans eyes, sans taste, sans everything.

- William Shakespeare

What is Frailty?

- A clinical syndrome of physiological decline and loss of functional independence characterized by increased vulnerability and decreased resilience to stressors

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Measures

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- **Prospective**
  - CHSA Frailty index
  - Edmonton Frail Scale
  - Groningen Frailty Indicator
  - Essential Frailty Toolset
  - Clinical Frailty Score
  - modified Frailty Index
  - Multidimensional Prognostic Index
  - Risk Analysis Index
- **Retrospective**
  - mFI-11
  - mFI-5
  - VQI-FI
  - VQI-RAI

Types and Uses of Frailty Indices

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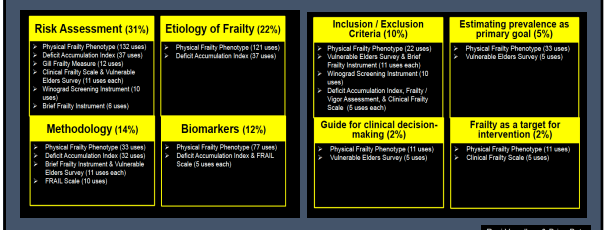

Ravi Varadhan & Brian Buta
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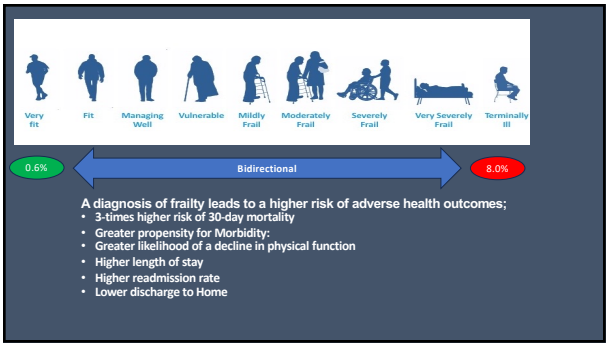
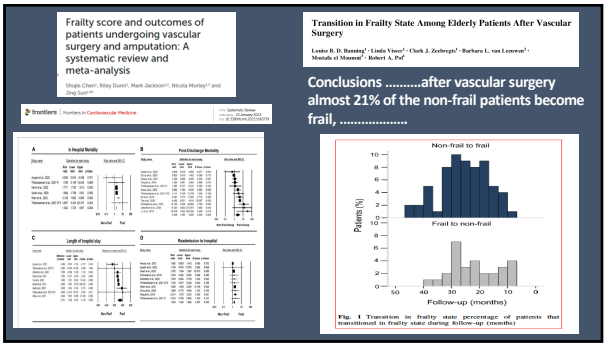


A diagnosis of frailty leads to a higher risk of adverse health outcomes;

- 3-times higher risk of 30-day mortality
- Greater propensity for Morbidity:
- Greater likelihood of a decline in physical function
- Higher length of stay
- Higher readmission rate
- Lower discharge to Home



Methods

- A prospective database of patients undergoing vascular intervention treatment of the lower extremity for tissue loss between 2018 and 2022
- Three primary interventions and One Control:
  - Endovascular - EV
  - Infra-inguinal bypass - BYP
  - Major Amputation – AMP
  - Wound Care –WOUND
- VQI-RAI was uses as measure of Frailty
- Patients were staged according to their initial frailty status pre-operatively and reclassified at 30 days and one year
- Four groups were identified at each reclassification:
  - Frail to Frail
  - Frail to Non-Frail
  - Non-Frail to Frail
  - Non-Frail to Non-Frail

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Frailty domain	VQI-RAI variable	Weighted VQI-RAI Scoring Paradigm	
Social	• Gender	Male = 3	
	• Age	≤ 19 = 0 20-24 = 1 25-29 = 4 30-34 = 6 35-39 = 8 40-44 = 10 45-49 = 12 50-54 = 14 55-59 = 16	60-64 = 18 65-69 = 20 70-74 = 22 75-79 = 24 80-84 = 26 85-89 = 28 90-94 = 30 95-99 = 32 ≥ 100 = 34
	Living Status • Livingstatus • Transfer	Residence other than independent living = 1	
Nutritional*	BMI (< 20 kg/m2 or ≥ 35kg/m2) • HTCM • WTKG	BMI (< 20 kg/m² or ≥ 35kg/m²) = 4	
Physical*	Congestive Heart Failure (CHF) • Prior_chf	CHF = 5	
	Renal Failure (CKD) • Preop_crea (> 1.78 mg/dL) • Dialysis	Renal failure = 8	
	Dyspnea • COPD	COPD = 3	
Functional	Activities of Daily Living (ADL) • Functstatus • Preop_ambul	Totally dependent Partially dependent Independent	14 7 0
Cognitive	Mental status • Mental status missing in VQI		

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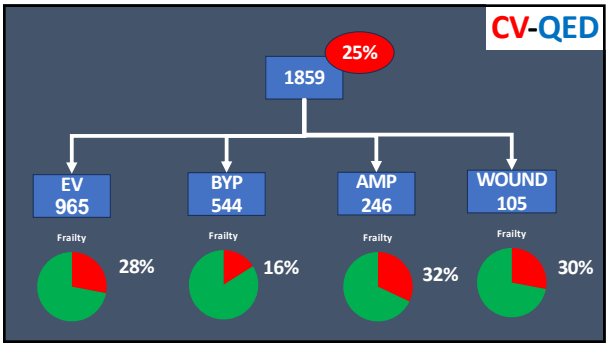
VQI- RAI = Gender + Age + Living Status + BMI + CHF + CKD + COPD + ADL

The cutoff to dichotomize frail vs non-frail patients was

VQI-RAI score ≥35



Pre-operatively Frail vs Non-Frail

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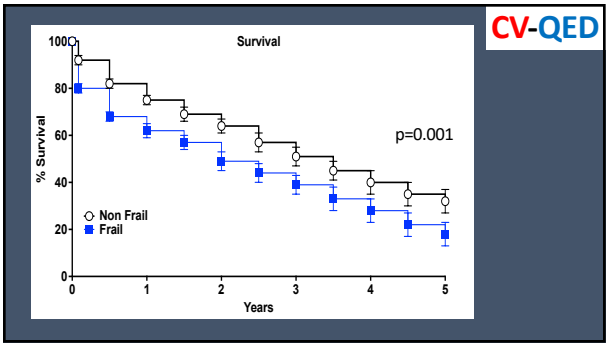
	Frail	Non Frail	p-Value	
90-day perioperative mortality	6%	1%	0.001	
90-day perioperative morbidity	33%	4%	0.001	
Length of stay	11±7 days	4±2 days	0.01	
Readmission rate	27%	9%	0.001	
Discharge home	22%	51%	0.02	
30-day OPG				Goal
MACE	14%	2%	0.003	≤10%
MALE	20%	2%	0.001	≤9%
Amputation	5%	1%	0.02	≤4%

	Baseline
Non-Frail	76%
Frail	24%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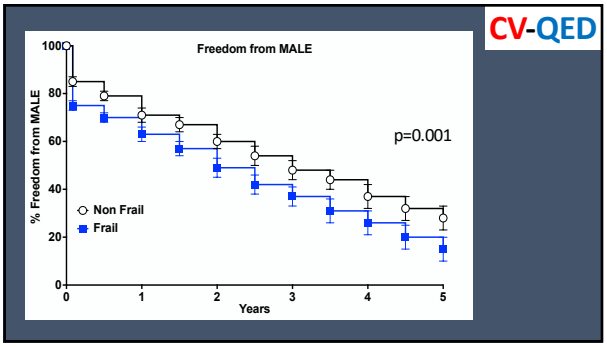
Survival
% Survival
Years
p=0.001
Non Frail
Frail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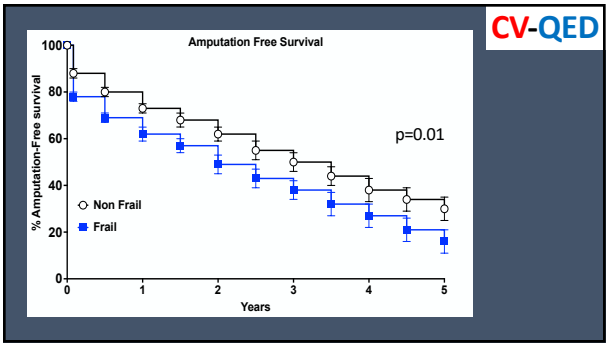
Freedom from MALE
% Freedom from MALE
Years
p=0.001
Non Frail
Frail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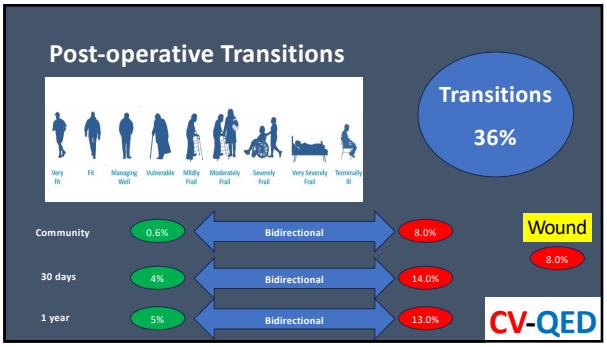
Amputation Free Survival
% Amputation-Free survival
Years
p=0.01
Non Frail
Frail


Post-operative Transitions
Transitions
36%
Community
0.6%
Bidirectional
8.0%
30 days
4%
Bidirectional
14.0%
1 year
5%
Bidirectional
13.0%
Wound
8.0%
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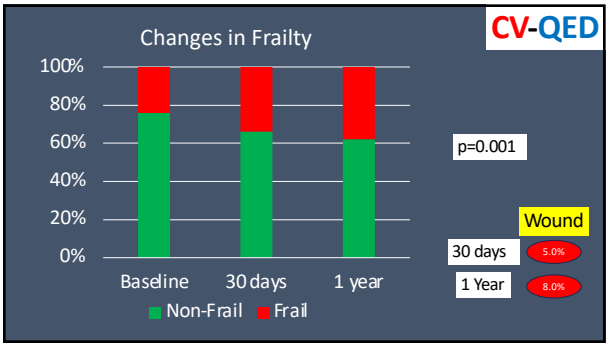
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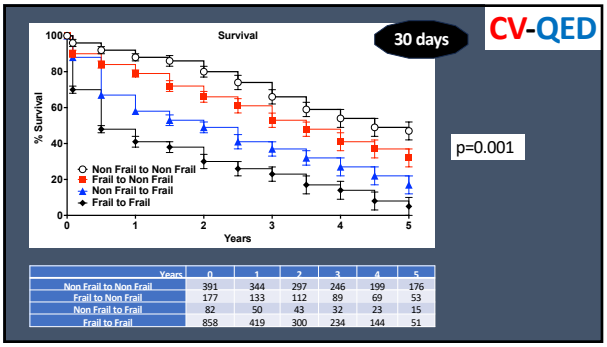
Changes in Frailty
100%
80%
60%
40%
20%
0%
Baseline
30 days
1 year
Non-Frail
Frail
p=0.001
Wound
30 days
5.0%
1 Year
8.0%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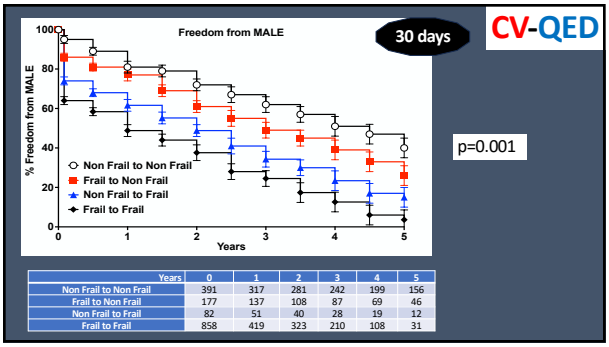
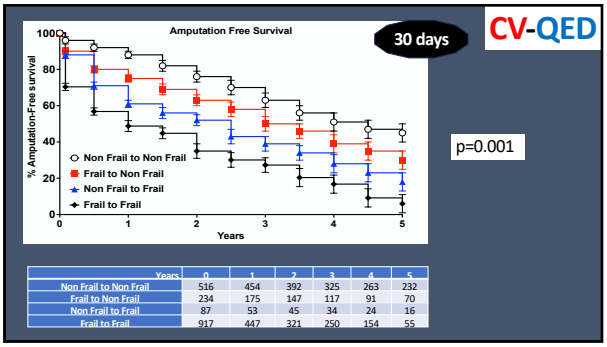
Survival
30 days
% Survival
Years
Non Frail to Non Frail
Frail to Non Frail
Non Frail to Frail
Frail to Frail
p=0.001
Years 0 1 2 3 4 5
Non Frail to Non Frail 391 344 297 246 199 176
Frail to Non Frail 177 133 112 89 69 53
Non Frail to Frail 82 50 43 32 23 15
Frail to Frail 858 419 300 234 144 51



Years	0	1	2	3	4	5
Non Frail to Non Frail	391	317	281	242	199	156
Frail to Non Frail	177	137	108	87	69	46
Non Frail to Frail	82	51	40	28	19	12
Frail to Frail	858	419	323	210	108	31



Years	0	1	2	3	4	5
Non Frail to Non Frail	516	454	392	325	263	232
Frail to Non Frail	234	175	147	117	91	70
Non Frail to Frail	87	53	45	34	24	16
Frail to Frail	917	447	321	250	154	55

Role of the Pre-frail state

- **Pre-frailty can be defined as a clinically silent process that predisposes individuals to frailty. The Fried criteria consist of five components, and individuals meeting three or more of these criteria are considered frail:**
  - **Unintentional Weight Loss:** Self-reported unintentional weight loss of 10 pounds or more in the past year.
  - **Exhaustion:** Self-reported exhaustion, as determined by responses to two questions about energy and fatigue from the Center for Epidemiologic Studies Depression (CES-D) scale.
  - **Weakness:** Grip strength is measured using a dynamometer, and weakness is defined based on sex-specific cutoff points.
  - **Slow Walking Speed:** Walking speed is measured over a 15-foot course, and individuals are categorized as slow based on sex-specific cutoff points.
  - **Low Physical Activity:** Physical activity is assessed using the Minnesota Leisure Time Physical Activity questionnaire, and individuals are categorized as having low physical activity based on their responses.

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Role of the Pre-frail state

- VQI- RAI has 4 assessable domains
  - Social
  - Nutritional
  - Functional
  - Physical
  - ~~Cognitive~~
- Two positive domains may indicate Prefrailty

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Influence of the Pre-Frail State

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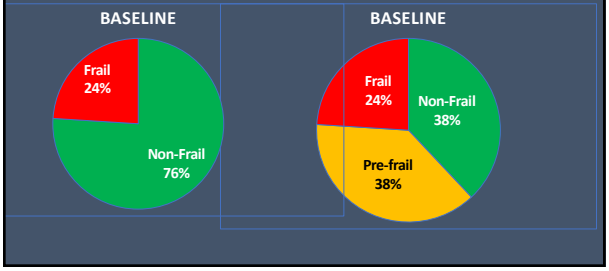
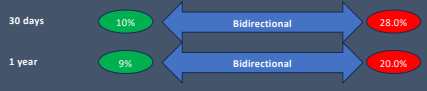


Post-operative Transitions in Pre-Frailty

Transitions 67%



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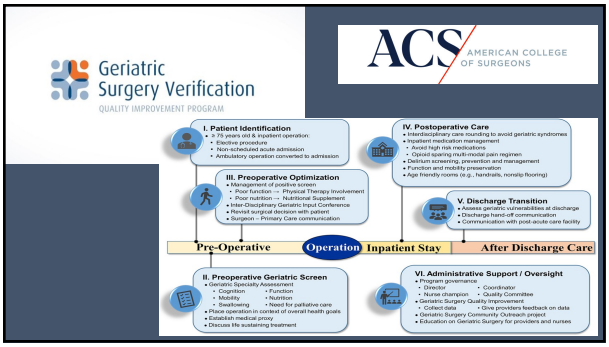
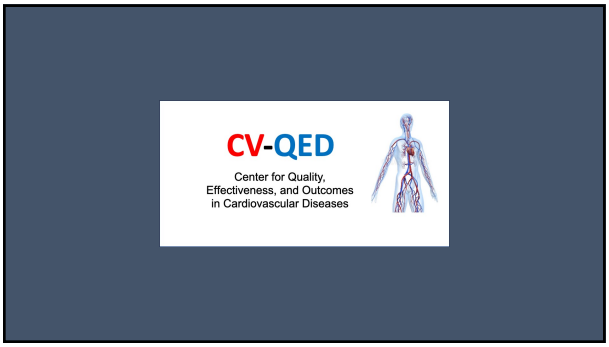

Geriatric Surgery Verification
QUALITY IMPROVEMENT PROGRAM
ACS AMERICAN COLLEGE OF SURGEONS
I. Patient Identification
• > 75 years old & inpatient operation;
• Elective procedure
• Non-scheduled acute admission
• Ambulatory operation converted to admission
III. Preoperative Optimization
• Management of positive screens
• Poor function → Physical Therapy Involvement
• Poor nutrition → Nutritional Supplement
• Inter-Disciplinary Geriatric Input Conference
• Revisit surgical decision with patient
• Surgeon – Primary Care communication
II. Preoperative Geriatric Screen
• Geriatric Specialty Assessment
• Cognition • Function
• Mobility • Nutrition
• Swallowing • Need for palliative care
• Place operation in context of overall health goals
• Establish medical proxy
• Discuss life sustaining treatment
IV. Postoperative Care
• Interdisciplinary care rounding to avoid geriatric syndromes
• Inpatient medication management
• Avoid high risk medications
• Opioid sparing multi-modal pain regimen
• Delirium screening, prevention and management
• Function and mobility preservation
• Age friendly rooms (e.g., handrails, nonslip flooring)
V. Discharge Transition
• Assess geriatric vulnerabilities at discharge
• Discharge hand-off communication
• Communication with post-acute care facility
VI. Administrative Support / Oversight
• Program governance
• Director • Coordinator
• Nurse champion • Quality Committee
• Geriatric Surgery Quality Improvement
• Collect data • Give providers feedback on data
• Geriatric Surgery Community Outreach project
• Education on Geriatric Surgery for providers and nurses
Pre-Operative
Operation
Inpatient Stay
After Discharge Care


Geriatric Surgery Verification
QUALITY IMPROVEMENT PROGRAM
ACS AMERICAN COLLEGE OF SURGEONS
JOURNAL OF THE AMERICAN GERIATRICS SOCIETY
Models of Geriatric Care, Quality Improvement, and Program Dissemination
Preliminary data demonstrate the Geriatric Surgery Verification program reduces postoperative length of stay


SVS
SOCIETY for VASCULAR SURGERY
ERAS Society
SOCIETY FOR VASCULAR SURGERY DOCUMENT
A framework for perioperative care for lower extremity vascular bypasses: A Consensus Statement by the Enhanced Recovery after Surgery (ERAS®) Society and Society for Vascular Surgery
ABSTRACT
JVS-Vascular Insights
A framework for perioperative care in lower extremity major limb amputation: a consensus statement by the Enhanced Recovery After Surgery (ERAS) Society and Society for Vascular Surgery


SVS
SOCIETY for VASCULAR SURGERY
ERAS Society
Journal of Vascular Surgery
Implementation of an enhanced recovery program for lower extremity bypass
ORIGINAL ARTICLES
Clinical Impact of an Enhanced Recovery Program for Lower-extremity Bypass
• ERAS patients had decreased total and postoperative LOS
• Variable and total costs for ERAS patients were significantly reduced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