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Strategies for Prehabilitation: Addressing Vulnerabilities of an Aging Population

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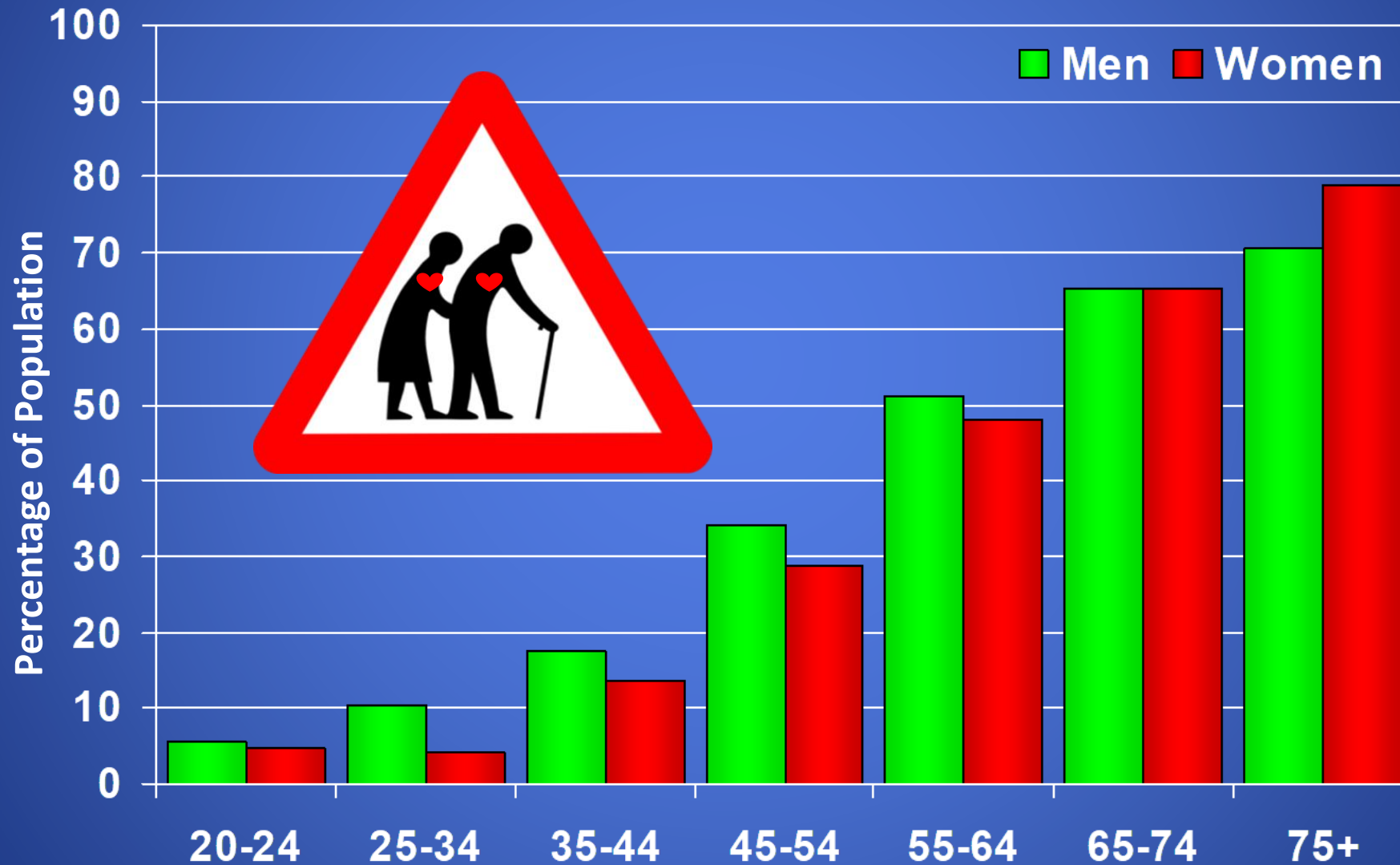
Director of Translational Research, GRECC, VA Pittsburgh Healthcare System

Director of Whole Health Research, VA Pittsburgh Healthcare System

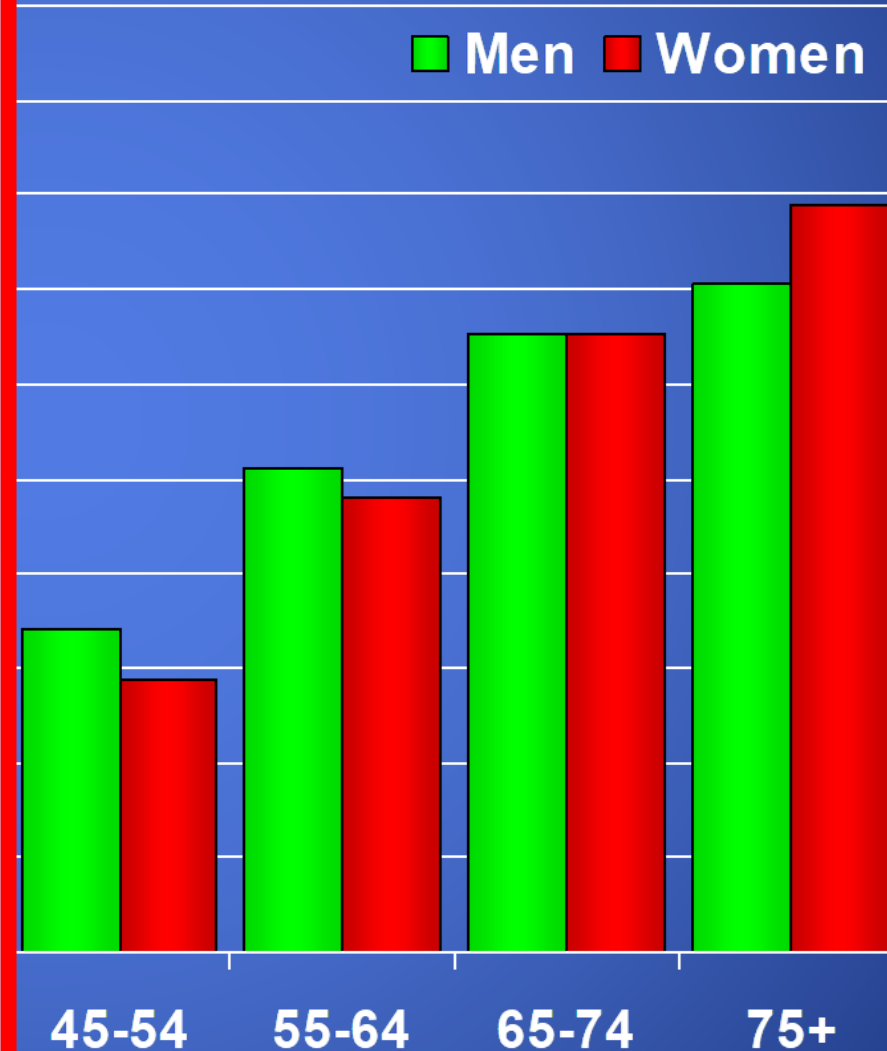


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 - PCORI IHS-2021C3-24147

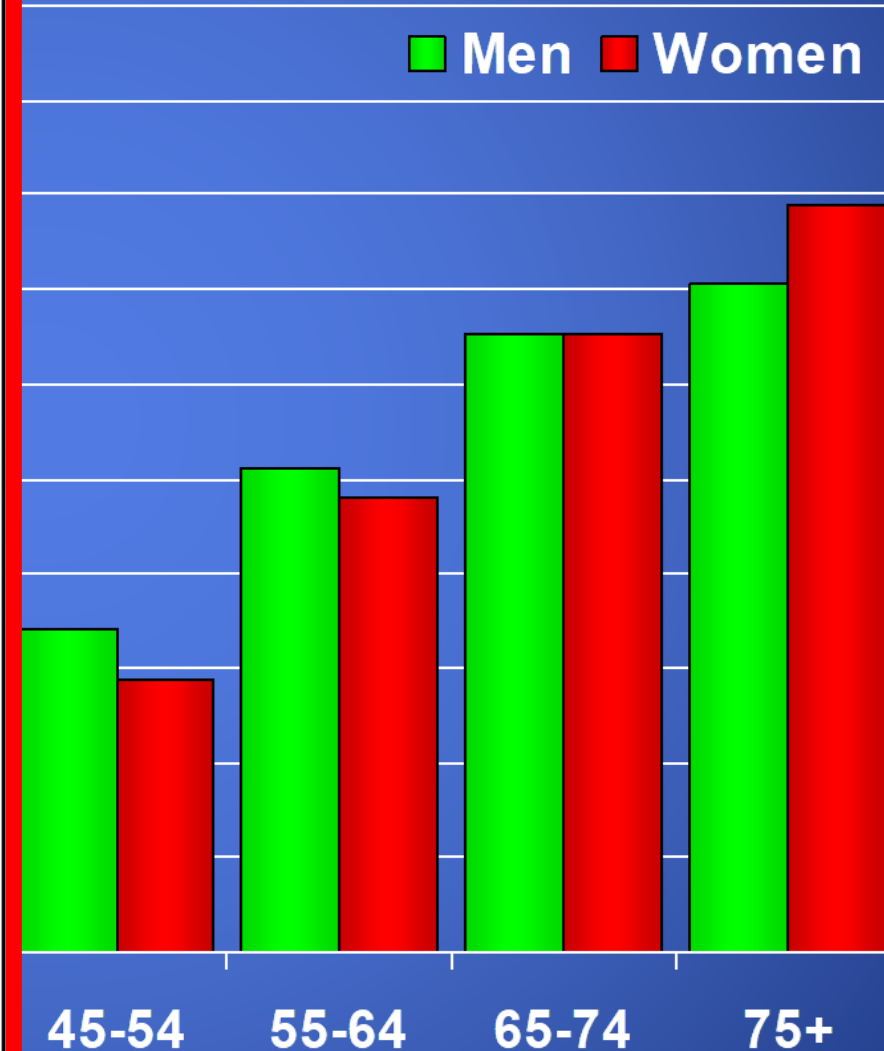
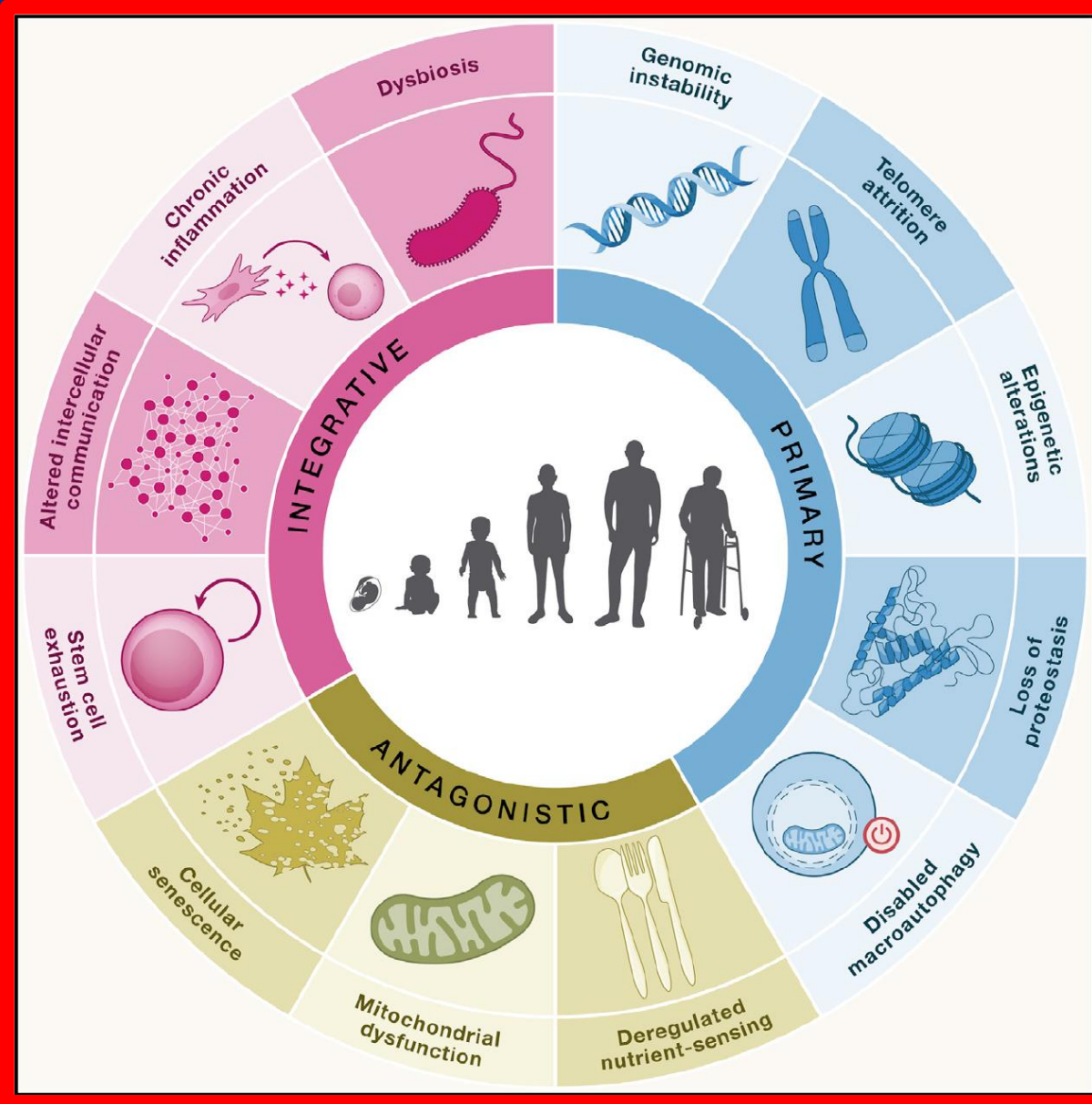
↑ CVD with Aging

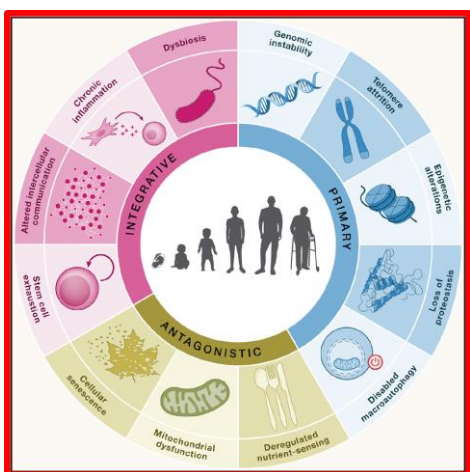
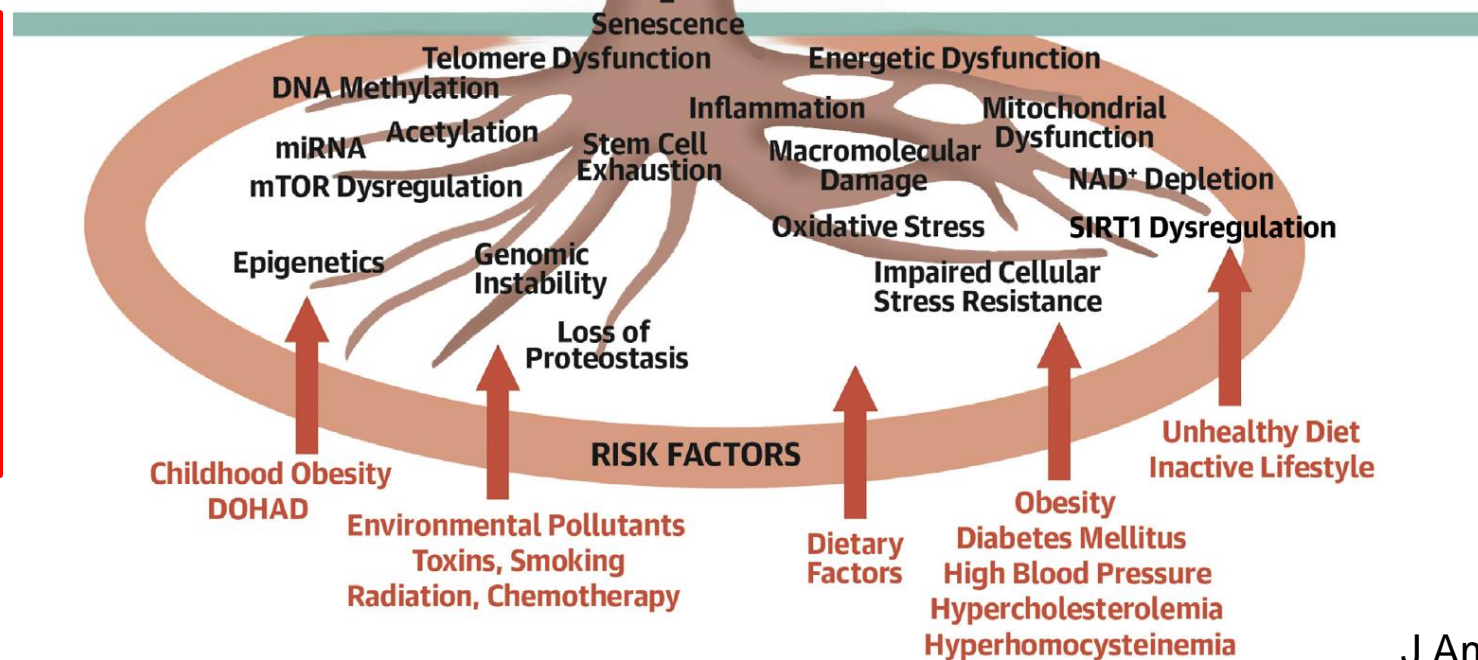
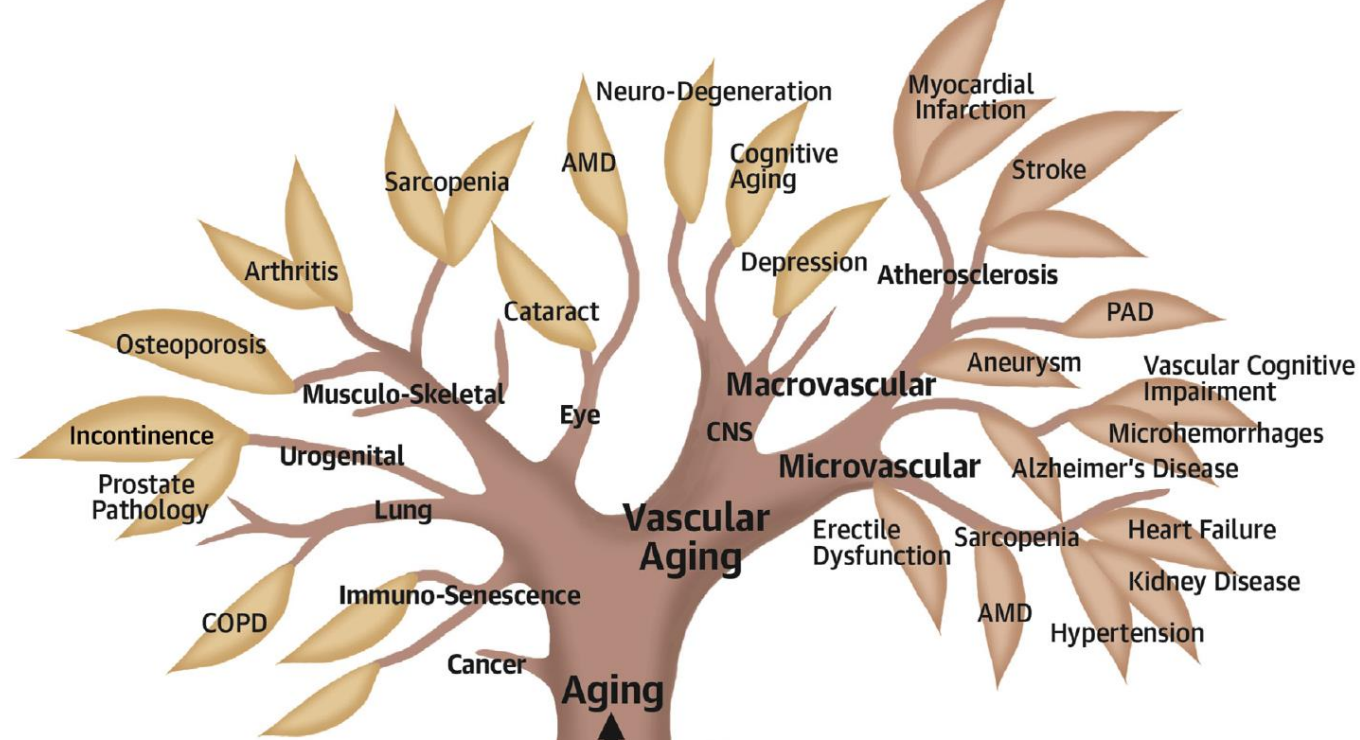


↑ CVD with Age: *Driven by Biological Changes*

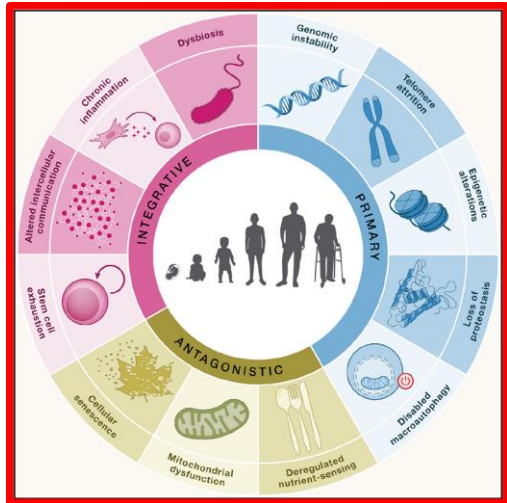
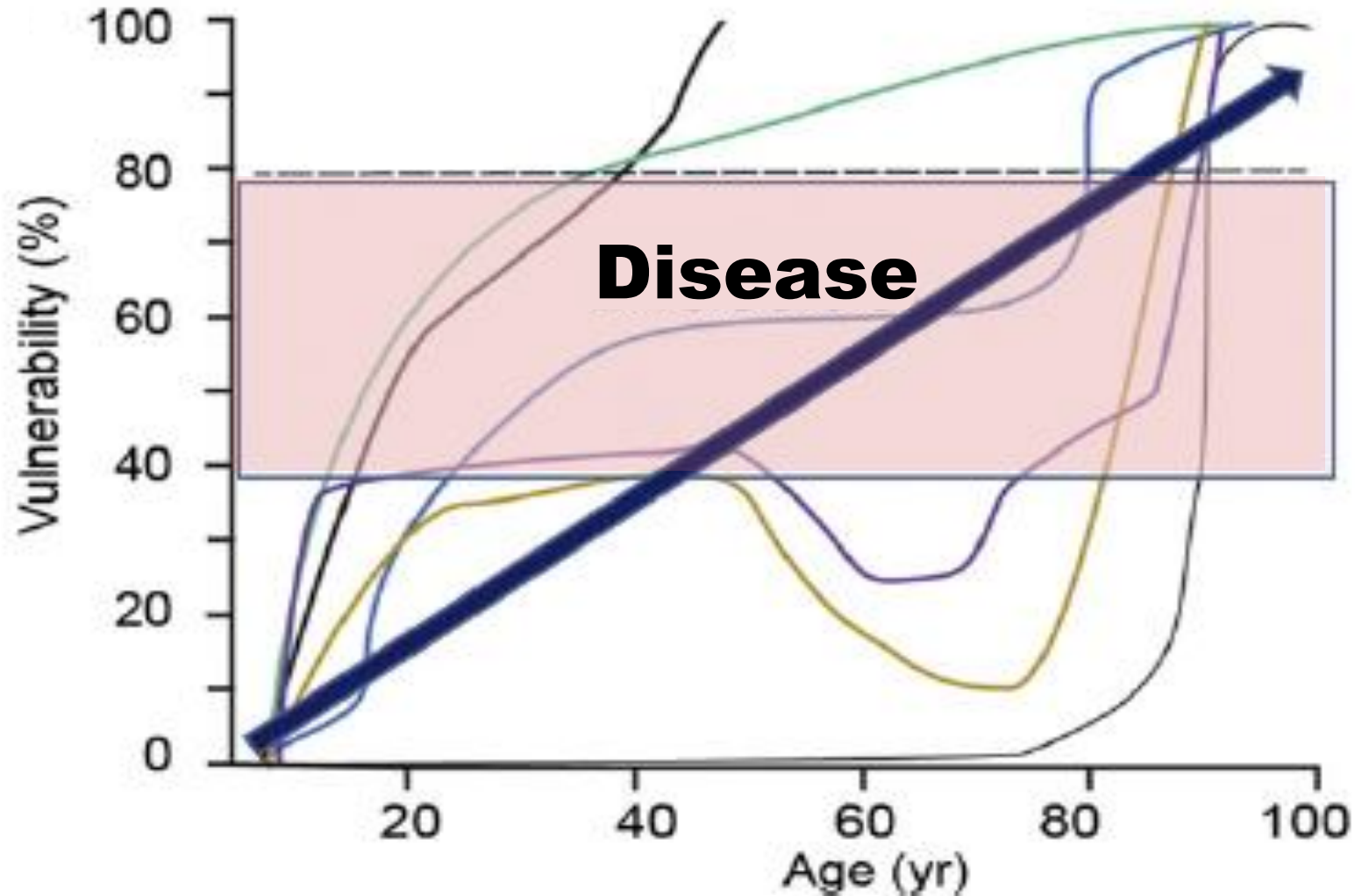


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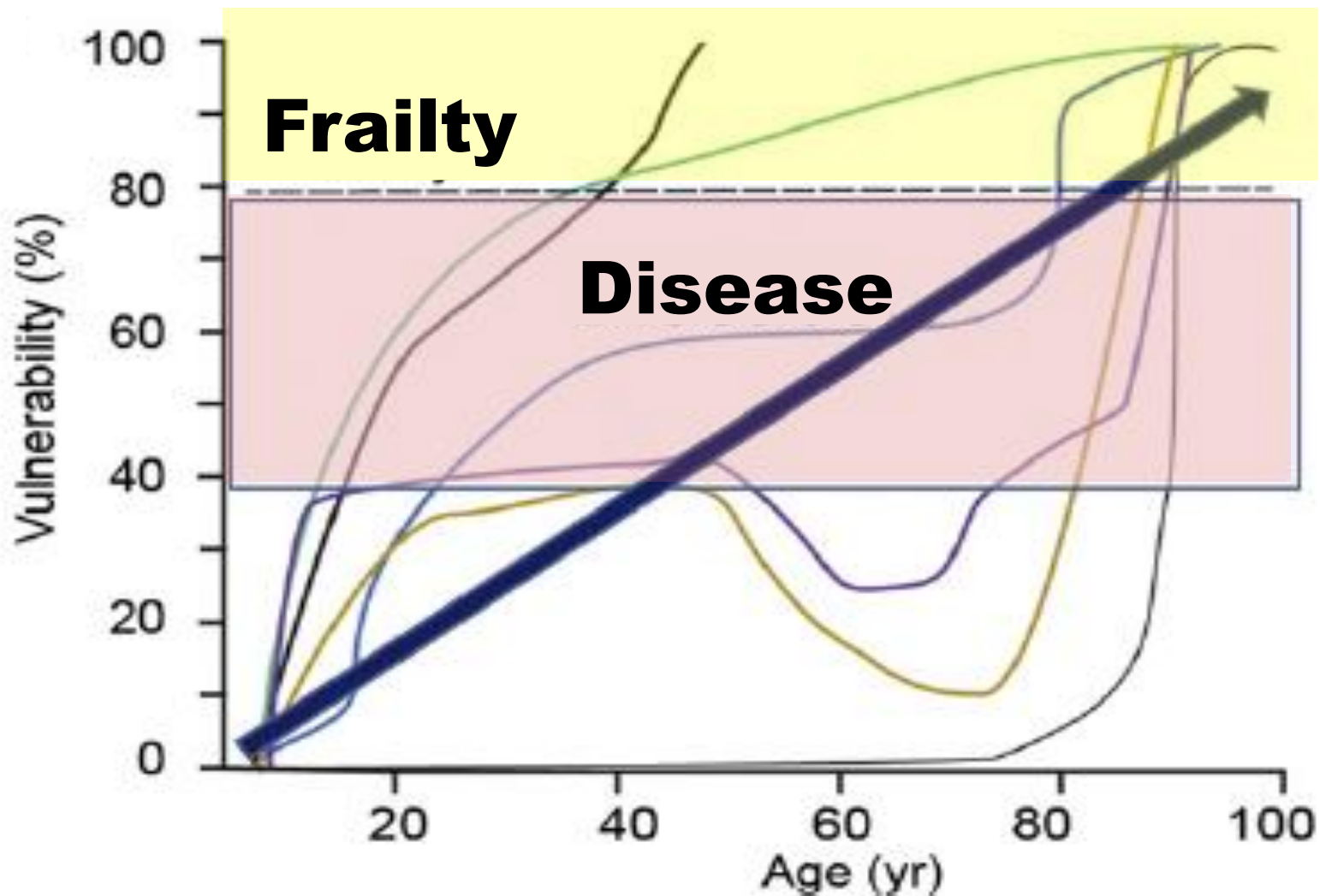
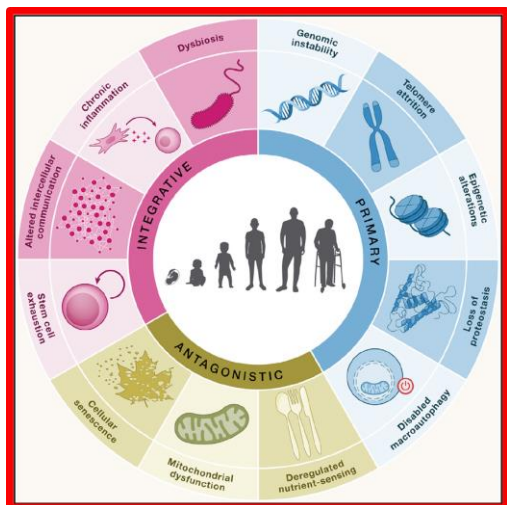




Age: CVD in a Context of Multimorbidity



Multimorbidity and Frailty Are Biologically Linked



Exhausted
Functional Reserve

Frailty: Cumulative declines across multiple physiologic systems

Physical Frailty Phenotype

Unintentional weight loss: >5% body weight unintentionally in last year, or BMI < 18.5kg/m²

Exhaustion: felt unusually tired or unusually weak 'all of the time' or 'most of the time' or reported energy level was ≤3

Low Activity: < 128 kcal (men) or <90 kcal (women) of energy expenditure based on 6 self-reported questions

Slowness: Average walking speed over 4-meter course:
Men ≤ 0.65m/s for height ≤173 cm or ≤0.76m/s for height >173cm.
Women: ≤0.65m/s for height ≤159cm or ≤0.76m/s for height > 159cm

Weakness: Maximal grip strength:
Men: ≤29kg for BMI ≤24; ≤30kg for BMI 24.1-28; ≤32kg for BMI >28.
Women: ≤17kg for BMI ≤23; ≤17.3kg for BMI 23.1-26; ≤18kg for BMI 26.1-29; ≤21 kg for BMI > 29.

Scoring: Frail = 3+ criteria met; prefrail = 1-2 criteria met; non-frail if 0 criteria met.

Deficit Accumulation Index

30-40 deficits - defined as symptoms, signs, disabilities and diseases.

Each deficit is scored as binary (0 or 1) or can be graded (e.g., 0, 0.5, 1)

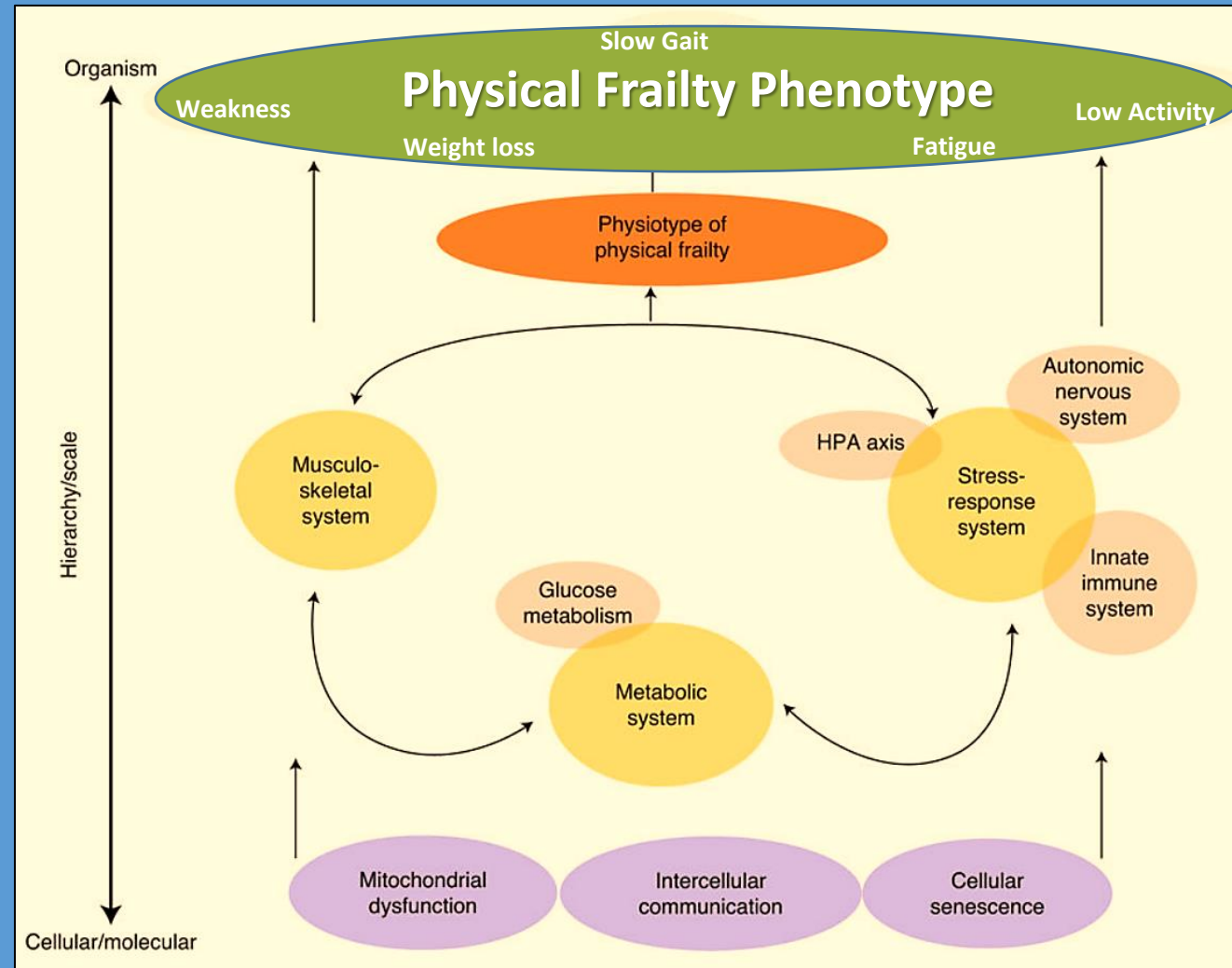
Examples of deficits include: disability; cognitive or physical impairments, co-morbidities, self-rated health, depression/mood.

Scoring: the ratio of deficits present over the total number of deficits included (e.g., if 10 out of 40 deficits total, the index score = 0.25).

Scoring: A person with frailty index score of ≥0.2 is deemed frail.

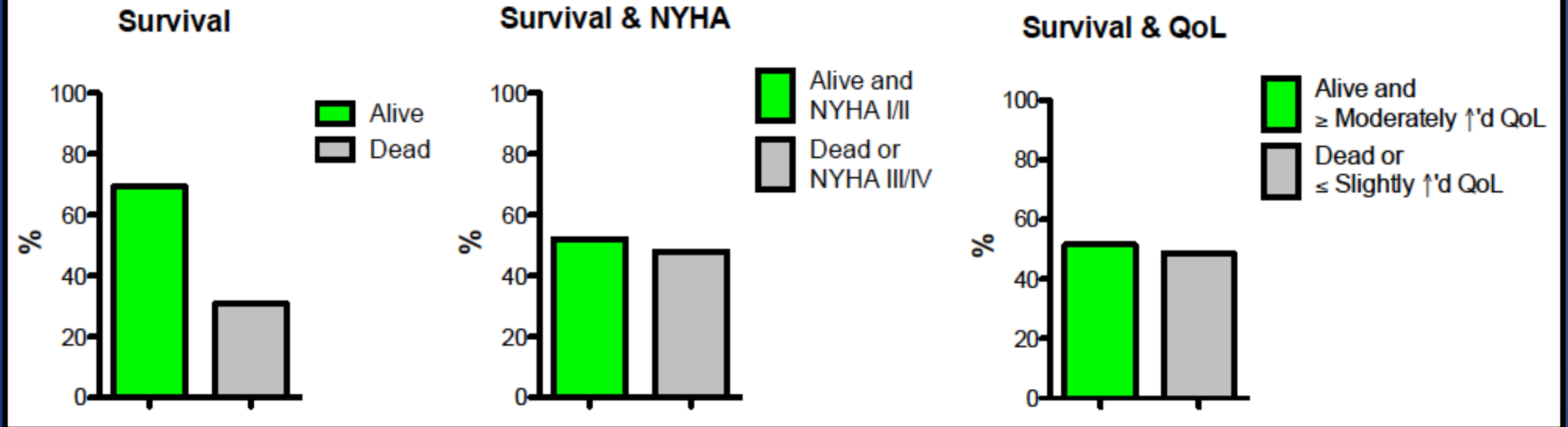

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Biologic Underpinnings to of Frailty



TAVR: *Which patients will benefit?*

Prohibitive Risk Patients in the PARTNER Trial - 1 Year Outcomes







Periprocedural Enhancements are Insufficient

- Surgical Techniques
- Anesthesia Techniques
- Fluids
- Medications
- Nutrition
- Mobilization
- PT
- Post-Acute Care
- Sleep



Persistent Risk

- Hospital-associated disability
- Worsening frailty
- Delirium
- Falls
- Loss of independence





European Society
of Cardiology

European Heart Journal: Acute Cardiovascular Care

<https://doi.org/10.1093/ehjacc/zuab126>

EDITORIAL

Acute Coronary Syndromes

Applying frailty to guide myocardial infarction management: an important step towards precision medicine and personalized care for older adults

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What are Frailty-Associated Risks

- Multimorbidity
 - CVD, Pulmonary, Osteoarthritis, Movement abnormalities, DM,
 - Geriatric Syndromes (Sensory Impairments, Incontinence, Polypharmacy, Falls)
- Sarcopenia
 - Dynapenia, Atrophy (inflammation, denervation, fatty infiltration)
- Cognitive Risks
 - Memory, Executive Function, Delirium
- Functional Decline
 - Fatigue, Dyspnea, Deconditioning, Disability

Potential Therapeutic Enhancements

- Process of Care
 - Prehabilitation
 - Rehabilitation
 - Transitions of care
- Therapeutic Targets
 - Clinical: Malnutrition, Frailty/Sarcopenia, Deconditioning, Polypharmacy, Delirium, Isolation
 - Biologic: Inflammation, Mitochondrial, Epigenetics, Senescence, Nutrient Sensing
(Lifestyle, Pharmacological)
 - Social Determinants of Health (Access, costs, surveillance)

VAPHS Prehabilitation Feasibility Trial

- 8/2017—1/2020: 43 pts thoracic (26), abdominal (8), urological (3), cardiac (7)
- 36/43 (84%) completed a prehabilitation regimen (median 5 weeks) up to surgery
- Risk Analysis Index 35.1
- Multimodal Prehabilitation: (a) strength and coordination; (b) inspiratory muscle training; (c) aerobic training; and (d) nutritional coaching and supplementation.
- ↑physical function: TUG (2.3 sec) , gait speed (0.1 m/sec), Sit-to-stand (1.6 sec), 6MWT (41.7m)
- Respiratory Muscle Strength with significant improvements in MIP

Insights and Challenges

- Frail/Prefrail?
- Treatment Burden
- Adherence in the context of intrinsic instability, frailty, cognitive challenges, anxiety, pain
- Implementation
 - Facility-based and home-based?
 - Safety, Fear
 - Transitions (pre-surgery; post-surgery)
- Minimum Dose of Rehab required?
- Surgical Delay

Cardiac Rehabilitation?



Efficacy established but underutilized, especially among older adults who are frail and multimorbid

Notorious Challenges to CR Implementation

- Embedded Barriers
 - Multimorbidity, Frailty, Cognition
 - Socioeconomic Determinants of Health, Support
 - Access: Logistic, Technology
 - Lack of Clinician endorsement
- Poor Adherence
 - Motivation, Fear
- Safety
 - Falls, Discomfort

Cardiac Rehabilitation Research

- **Dissemination**

- MACRO: Modified Application of Cardiac Rehabilitation
- T2CR: Transition to Cardiac Rehabilitation

- **Telehealth**

- Beatty: McNair Comparativer Effectiveness of In-Person and Telehealth Cardiac Rehabilitation
- Lindman: Home-based cardiac rehabilitation using a novel mobile health exercise regimen following transcatheter heart valve interventions (HOME RUN HITTER)

- **Exercise Intervention**

- Kitzman: REHAB-HFpEF—PT delivery of CR
- Pack: Improving outcomes from cardiac rehabilitation among older adults through exercise testing and individualized exercise intensity prescriptions
- Mueller S: OptimEx-Clin (Optimizing Exercise Training in Prevention and Treatment of Diastolic Heart Failure)

Palliative Care Rehab: *Respiratory Muscle Training for Frail End-Stage HF Patients*

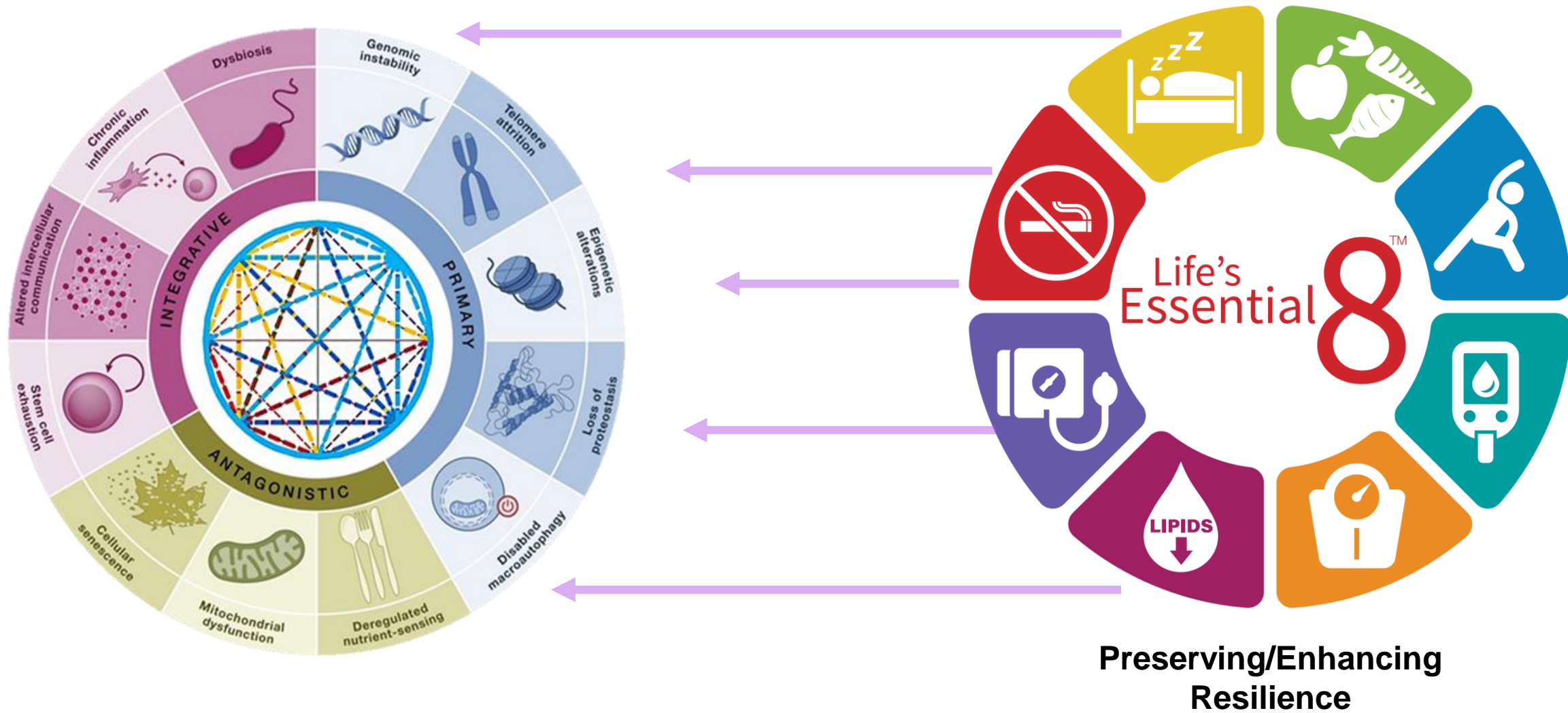
Older HF systolic patients (**N-30; ≥ 70 yrs**)

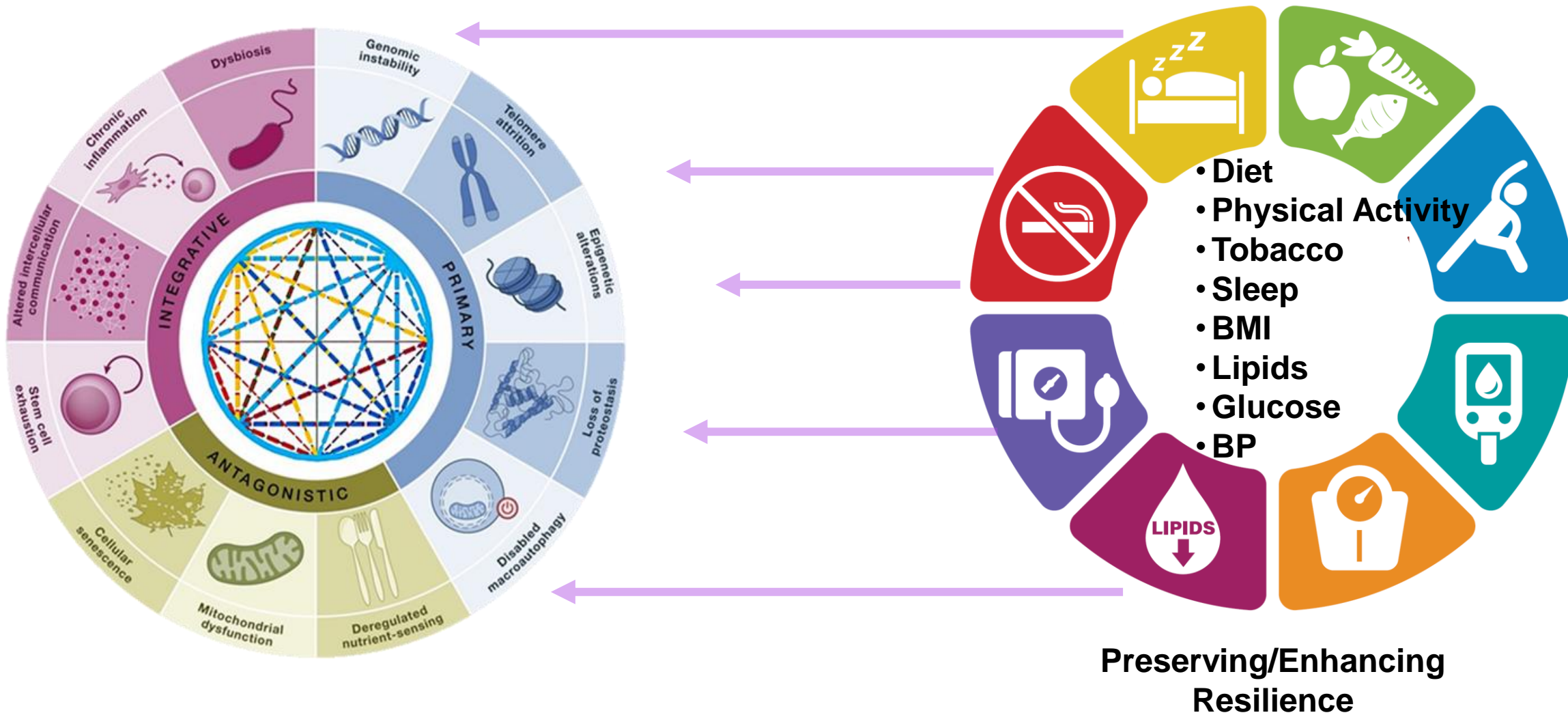
- HFrEF and HFpEF endstage disease
- Feasibility, safety
- Surveillance, medical monitoring

Endpoints

- Sit-to-Stand, Grip-strength, Fatigability, AM-PAC-CAT, Self-efficacy, Quality of life





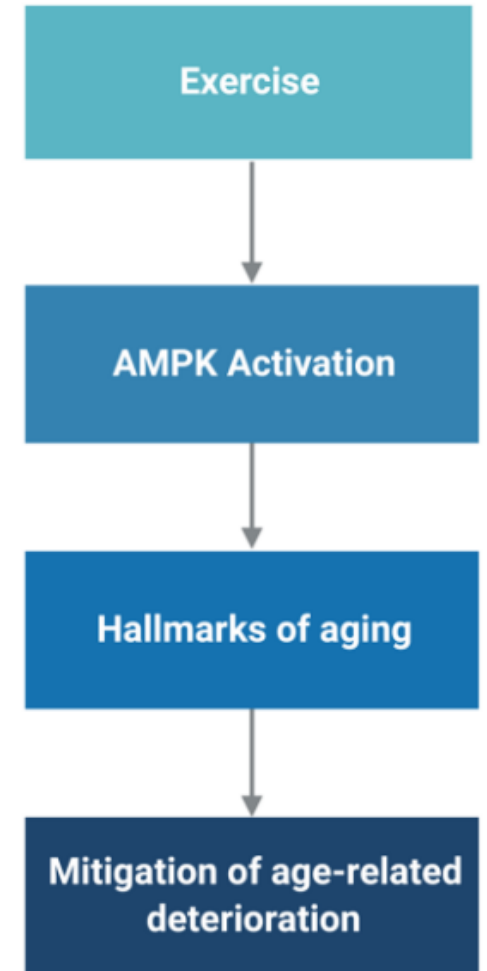


Aerobic exercise:

- ROS and inflammatory response stimulates homeostatic response
 - Mitochondrial Biogenesis and Function: AMPK, Sirt1, PGC-1- α , Akt
 - Insulin signaling: PI3-kinase
 - \downarrow SASP
 - \uparrow NO
 - \downarrow NF κ B, RAGE, TNF- α , NADPH, iNOS

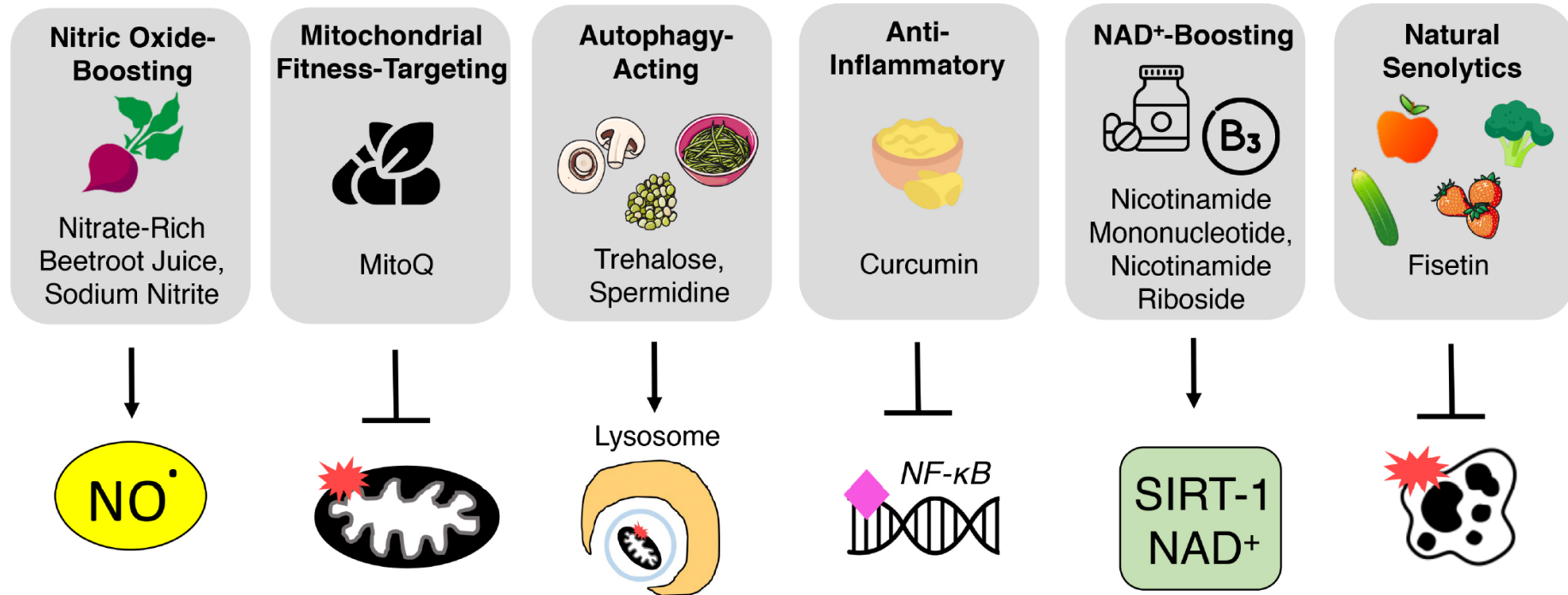
Resistance Training:

- Activates stem cells and mTOR signaling



Nutraceutical Resilience Enhancers

Compounds to Target Mechanisms



Mechanisms of Cardiovascular Aging

Pharmacological Resilience Enhancers

- Anti-inflammatory
 - Canakinumab, Colchicine, Clazakizumab
- Metabolic Drug Therapies
 - Metformin—AMPK, mitochondria, proteostasis, autophagy
 - SGLT2 inhibitors—Nutrient sensing, AMPK, Mitochondria, inhibit NLRP3, mTORC
- Senolytics/Senomorphics—Dasatinib:mesenchymal; Quercetin:endothelial

Summary

- Demographics of aging drive the relevance of prehabilitation
- Old adults are inherently susceptible to medical challenges for which interventions required, but also inherently susceptible to frailty, multimorbidity, and complexity of care.
- High priority to refine prehabilitation and other strategies to improve efficacy and value of healthcare.



129 days after surgery



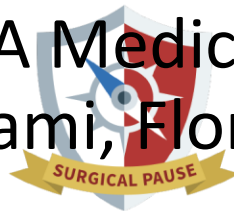
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Strategies for Prehabilitation

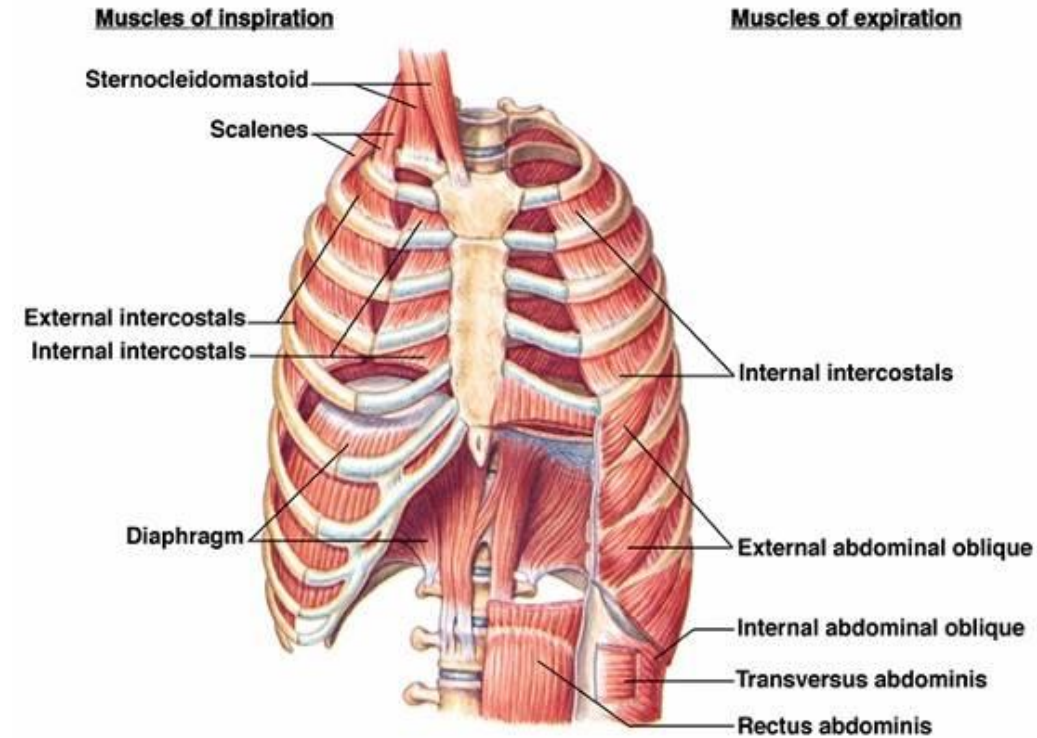
Respiratory Muscle Training

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Department of Physical Therapy
Coral Gables, Florida
Research Health Scientist, Research Service
Miami VA Medical Center
Miami, Florida



Respiratory Muscles and Respiratory Muscle Training

- Composed of all 3 muscle fibers
 - Slow-twitch oxidative
 - Fast-twitch oxidative glycolytic
 - Fast-twitch glycolytic
- Adult diaphragm: ~55% slow twitch fibers
- Disease and disuse can alter the % fiber type
 - Eliciting more slow twitch fibers and less fast-twitch
 - ✓ **Yielding more endurance and less strength**
 - ✓ **Producing a respiratory sarcopenia**
- **Respiratory muscle training** can improve respiratory muscle strength, power, & endurance
 - ✓ Yielding more efficient & effective breathing, gas exchange, and numerous physiologic and functional performance outcomes



Respiratory Muscle Training Methods/Devices

Different Methods & Devices



- Supine or Semi-recumbent with weights on the abdominal area
- Inspiratory muscle training (IMT) or expiratory muscle training (EMT) devices
- Combined IMT & EMT Devices



Spring-Loaded “Threshold” Respiratory Muscle Training Devices

“Threshold” Inspiratory Muscle Trainer



	Light	Medium	Heavy
Level 0	17cmH ₂ O	23cmH ₂ O	29cmH ₂ O
Level 1	25cmH ₂ O	39cmH ₂ O	53cmH ₂ O
Level 2	33cmH ₂ O	55cmH ₂ O	78cmH ₂ O
Level 3	41cmH ₂ O	72cmH ₂ O	102cmH ₂ O
Level 4	49cmH ₂ O	88cmH ₂ O	127cmH ₂ O
Level 5	58cmH ₂ O	104cmH ₂ O	151cmH ₂ O
Level 6	66cmH ₂ O	121cmH ₂ O	176cmH ₂ O
Level 7	74cmH ₂ O	137cmH ₂ O	200cmH ₂ O
Level 8	82cmH ₂ O	153cmH ₂ O	225cmH ₂ O
Level 9	90cmH ₂ O	170cmH ₂ O	249cmH ₂ O
Level 10	98cmH ₂ O	186cmH ₂ O	274cmH ₂ O

“POWERbreathe” Inspiratory Muscle Trainer

Flow-Dependent Respiratory Muscle Training Devices

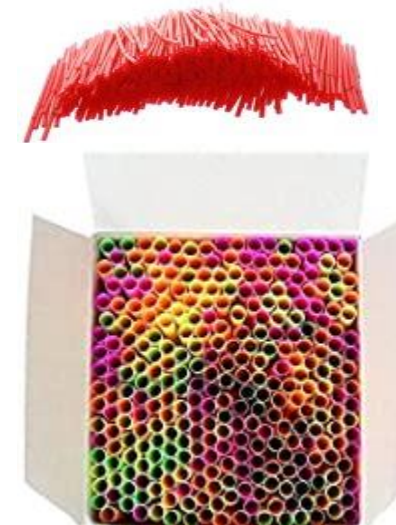
- P-flex



- DHD/Portex (Smiths Med)



- Straws



[#See10Breathe10Challenge](#)

Respiratory Muscle Therapy for SCI (Long)

RMT for patients with SCI video with citations: <https://www.youtube.com/watch?v=9wlc6MHRrdI&t=447s>

Threshold IMT vs POWERbreathe KH1

Novel Method for IMT in COPD

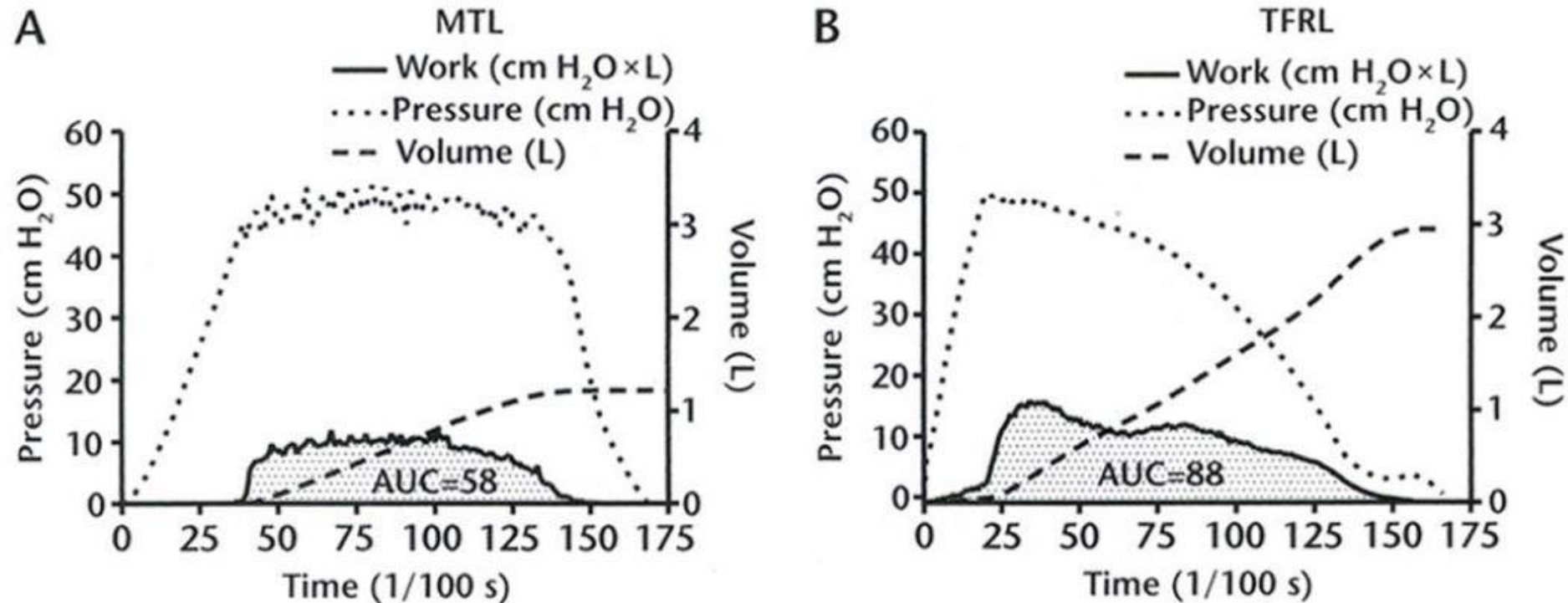


Figure 1.

Comparison between 2
 inspiratory pressure (50
 the curve for total exte



during a typical inhalation against a resistance
 = mechanical threshold loading, (B) TFRL = t
 work as integrated from mouth pressure (cm

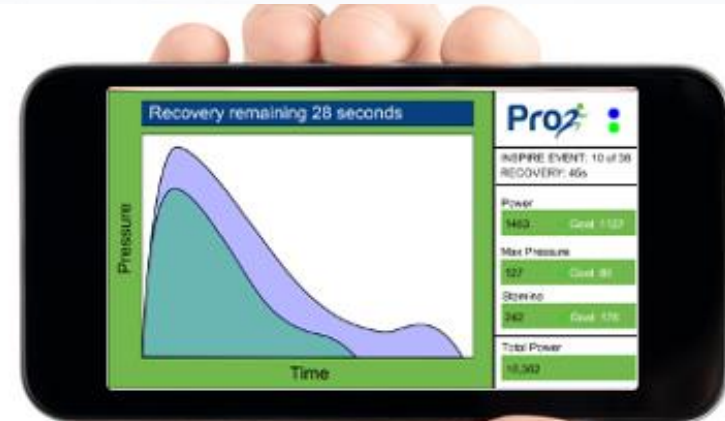


baseline maximal
 . AUC = area under
 ls over time.

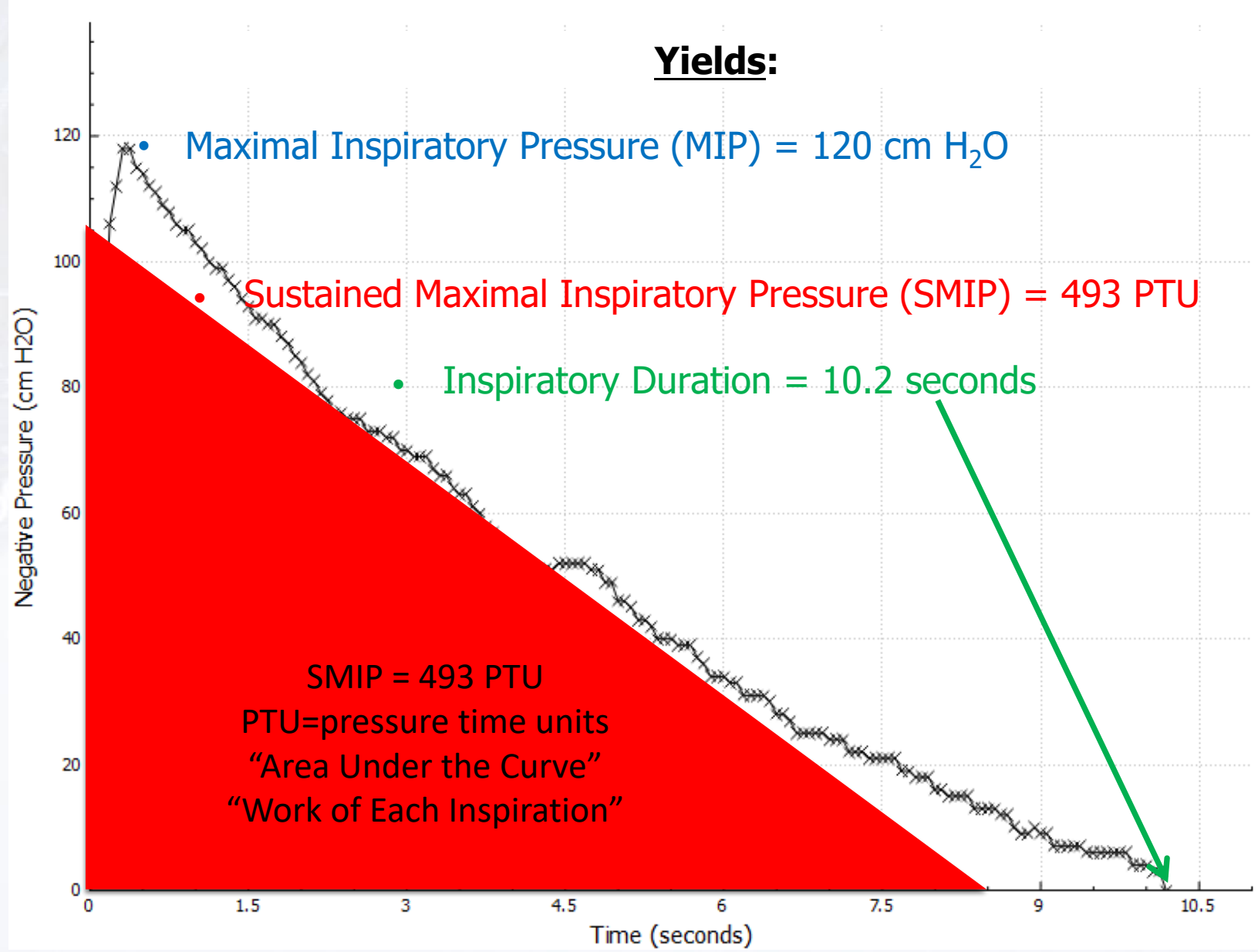
Phys Ther J
 2015;95(9):1264-1273

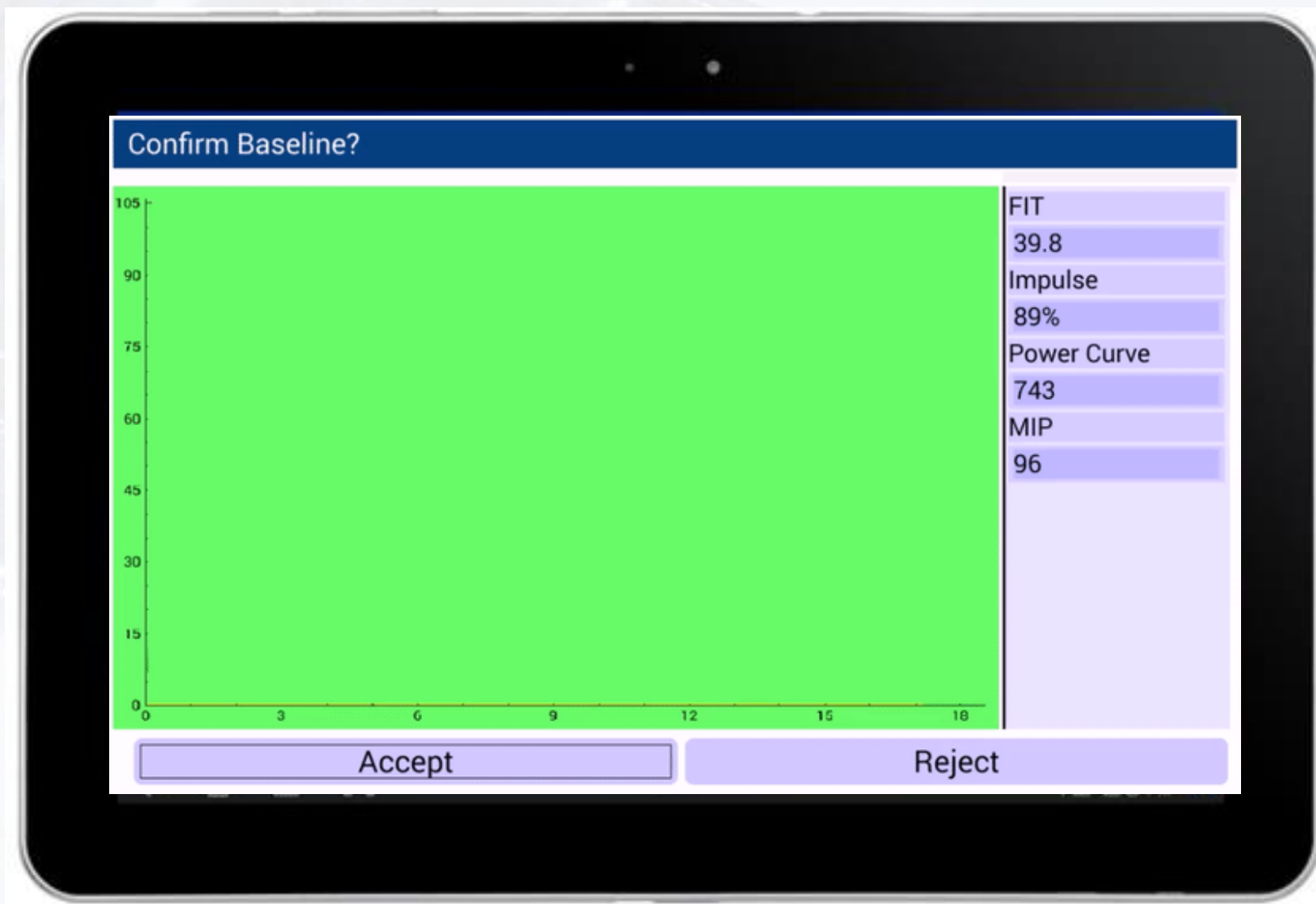
Test of Incremental Respiratory Endurance (TIRE)

- Maximal Inspiratory Pressure (MIP)
- Sustained Maximal Inspiratory Pressure (SMIP)
- Inspiratory Duration (ID)



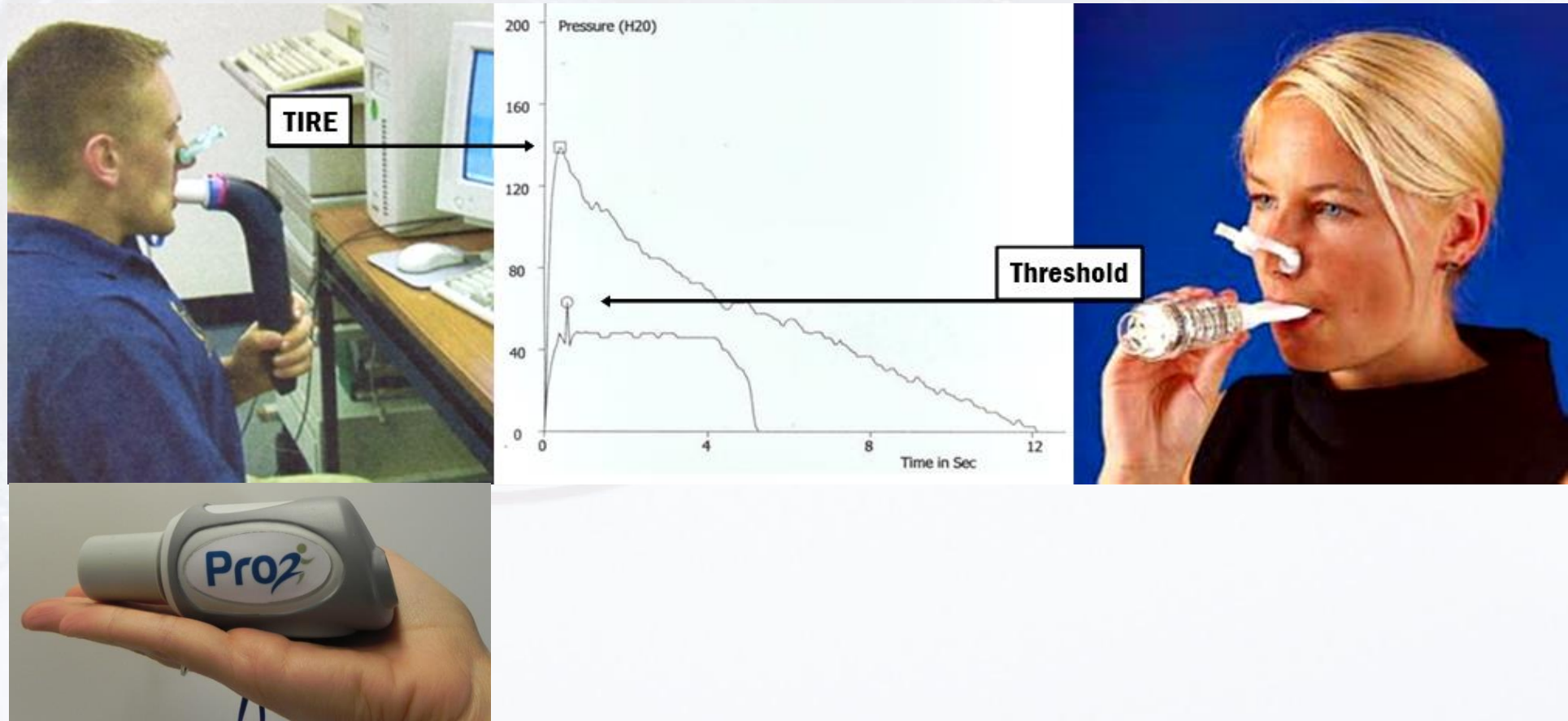
Measurement of Inspiratory Performance via the Test of Incremental Respiratory Endurance (**TIRE**)






TIRE Respiratory Muscle Testing & Training Data Immediately Sent to the Cloud For Real-time and Subsequent Surveillance of Respiratory Muscle Testing & Training Efforts

TIRE versus Threshold Inspiratory Muscle Training



Respiratory Muscle Training is NOT Incentive Spirometry!!

- No workload is imposed on the respiratory muscles
 - The literature supporting incentive spirometry is poor
 - Yet it continues to be a standard of care
- 
- Respiratory Muscle Training consists of:
 - A specific **mode** of training (one or more of the devices just reviewed)
 - **Inspiratory efforts at 20-80%** of maximal inspiratory pressure (MIP)
 - **Expiratory efforts at 5-50%** of maximal expiratory pressure (MEP)
 - A duration tailored to a patient's status and response to IMT (5-30 min)
 - A daily or every other day frequency based on level of effort
 - Progression of training based on weekly measurements of MIP and/or MEP

Combined Testing and Training Devices

- Respiratory muscle training devices that **TEST** and **TRAIN** provide greater training effects!!



TIRE Respiratory Muscle Trainer



POWERbreathe Inspiratory Muscle Trainer

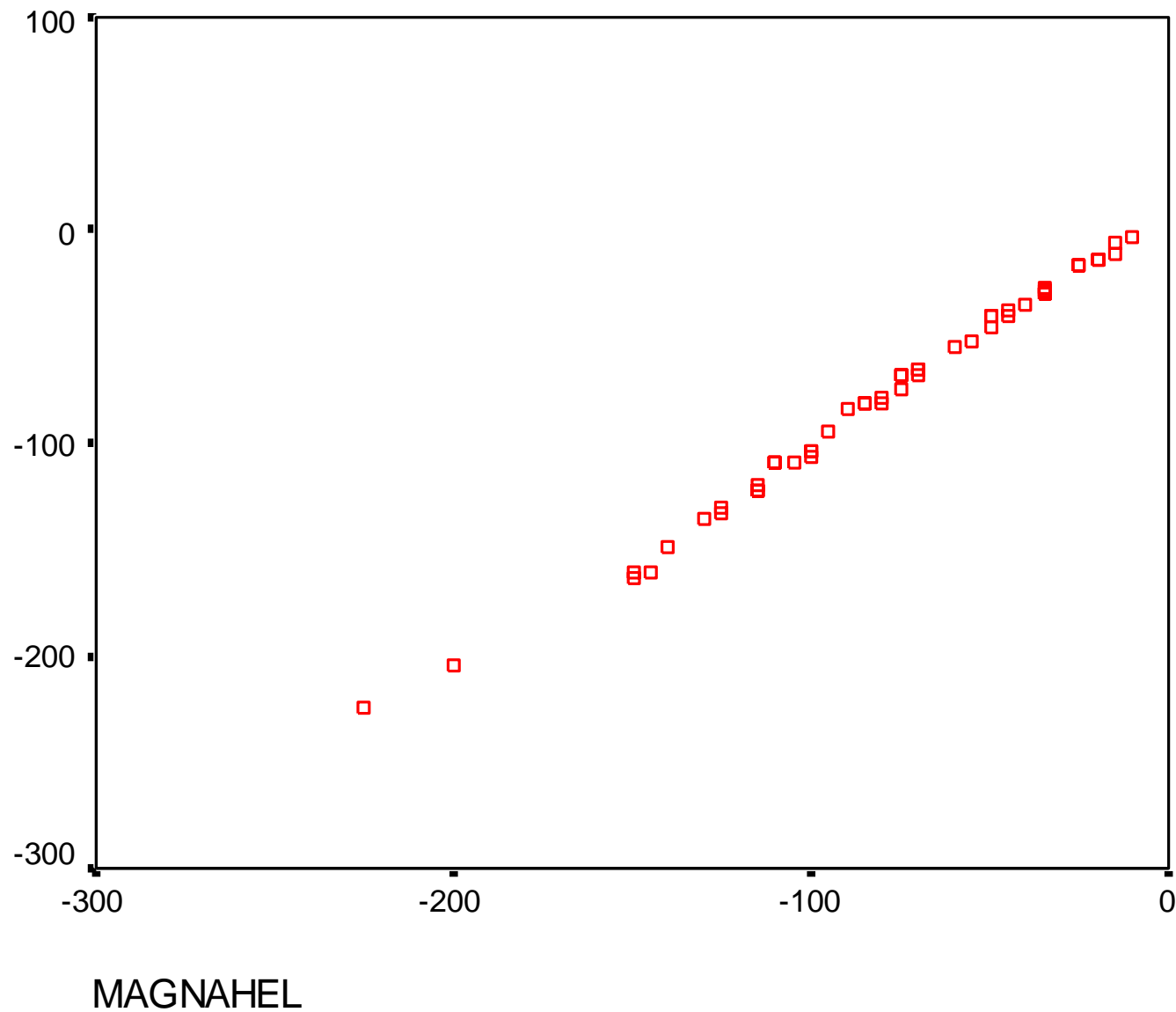
Methods to Measure Inspiratory & Expiratory Pressure



Magnehelic – Anaroid Respiratory Muscle Testing Methods

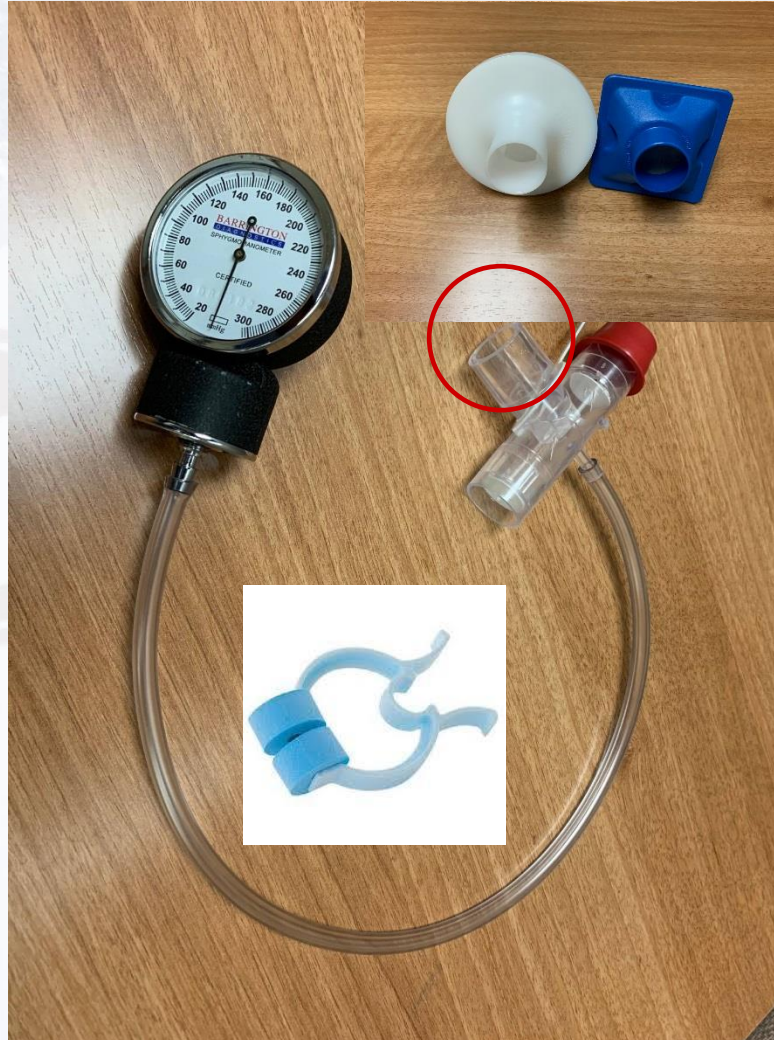


Magnahelic versus Anaroid Measurements



Sphygmomanometer to Test Respiratory Muscle Performance

- Sphygmomanometer attached with oxygen tubing to the DHD inspiratory muscle training device
- $\text{mmHg} \times 1.36 = \text{cm H}_2\text{O}$



Threshold & P-flex Inspiratory Muscle Trainer with O₂ Port Attached to a Sphygmomanometer

O₂ Port Could Also Provide Supplemental Oxygen



Why Perform Respiratory Muscle Training?

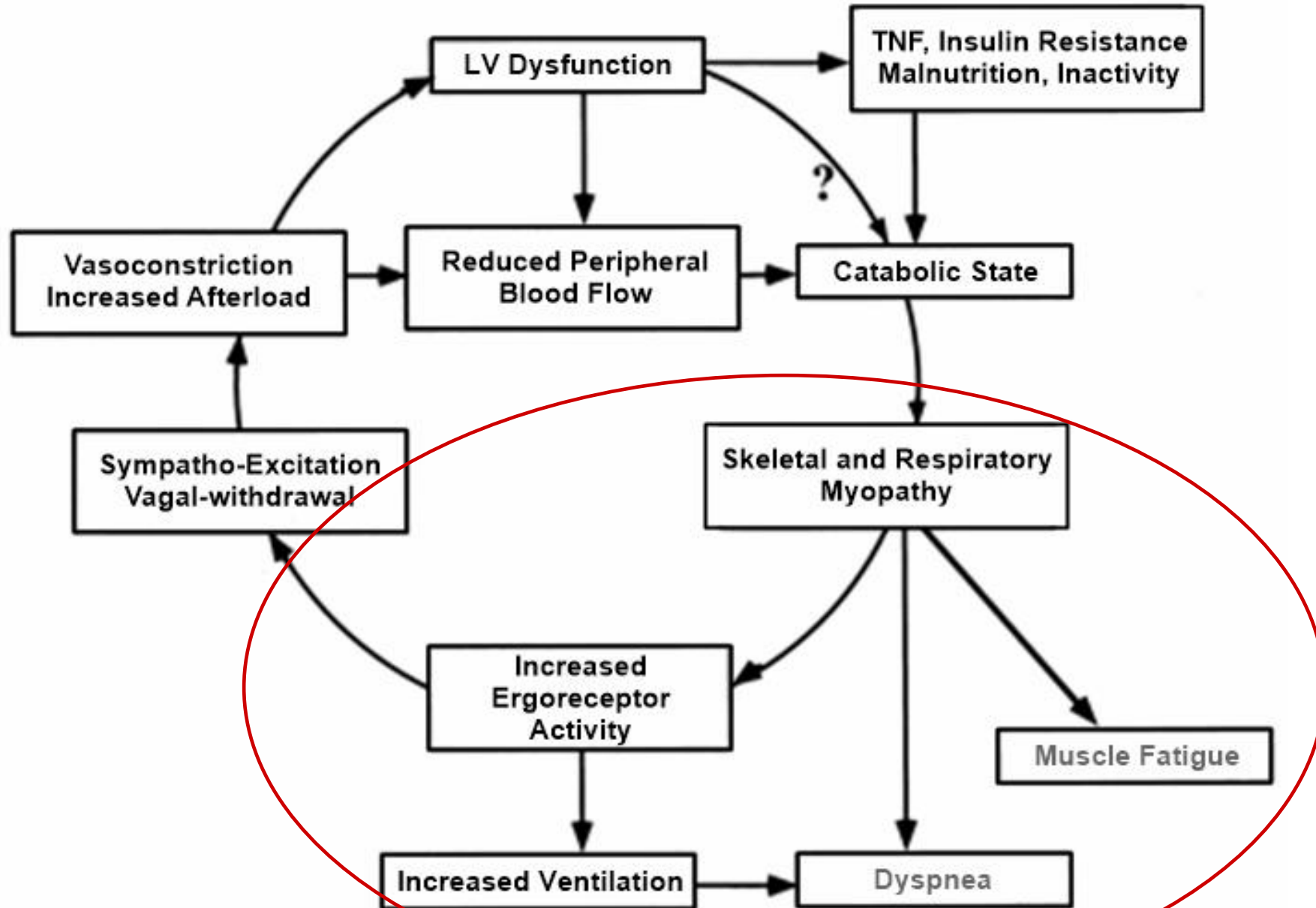


VHA DIFFUSION OF EXCELLENCE

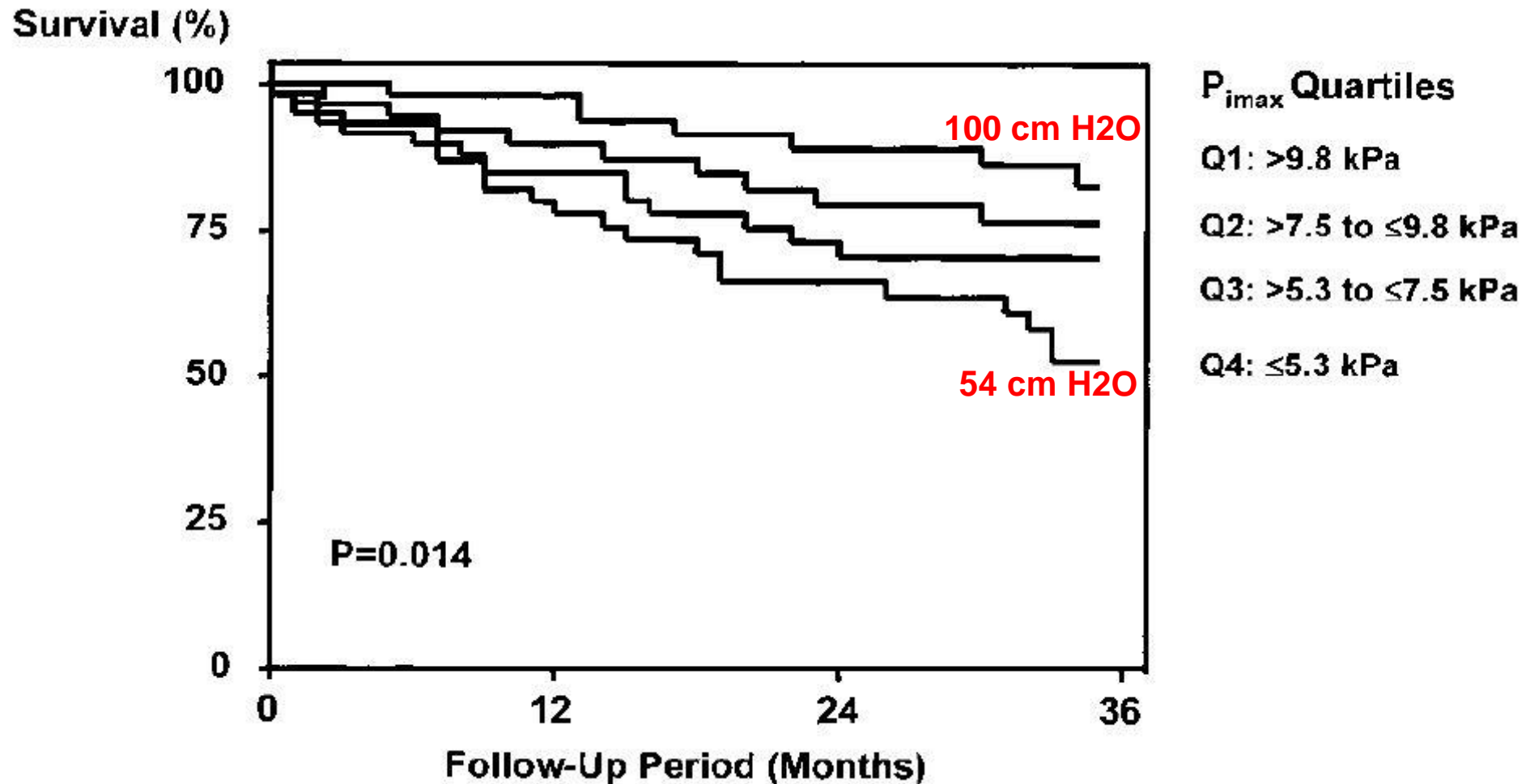
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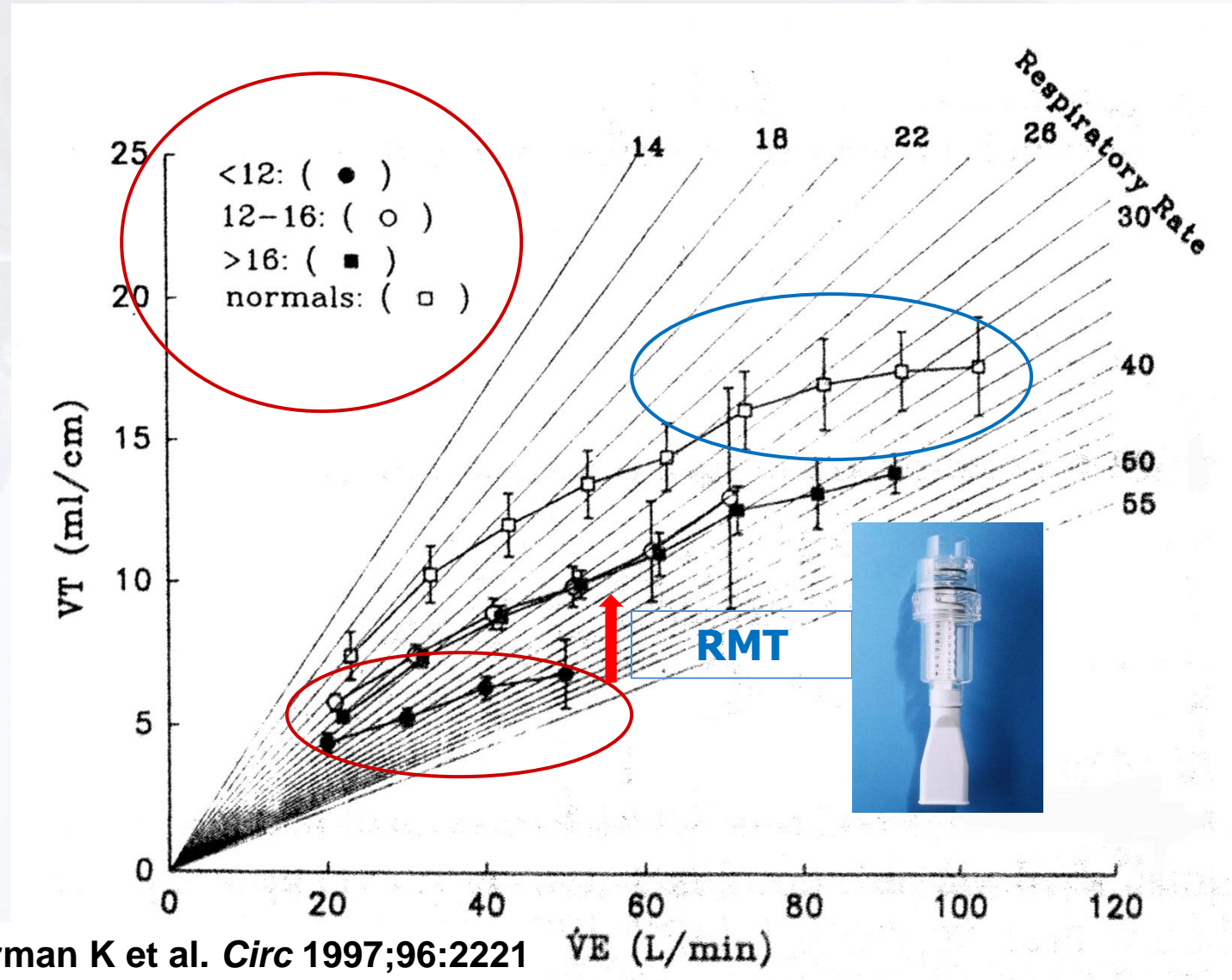
The Muscle Hypothesis of Chronic Heart Failure



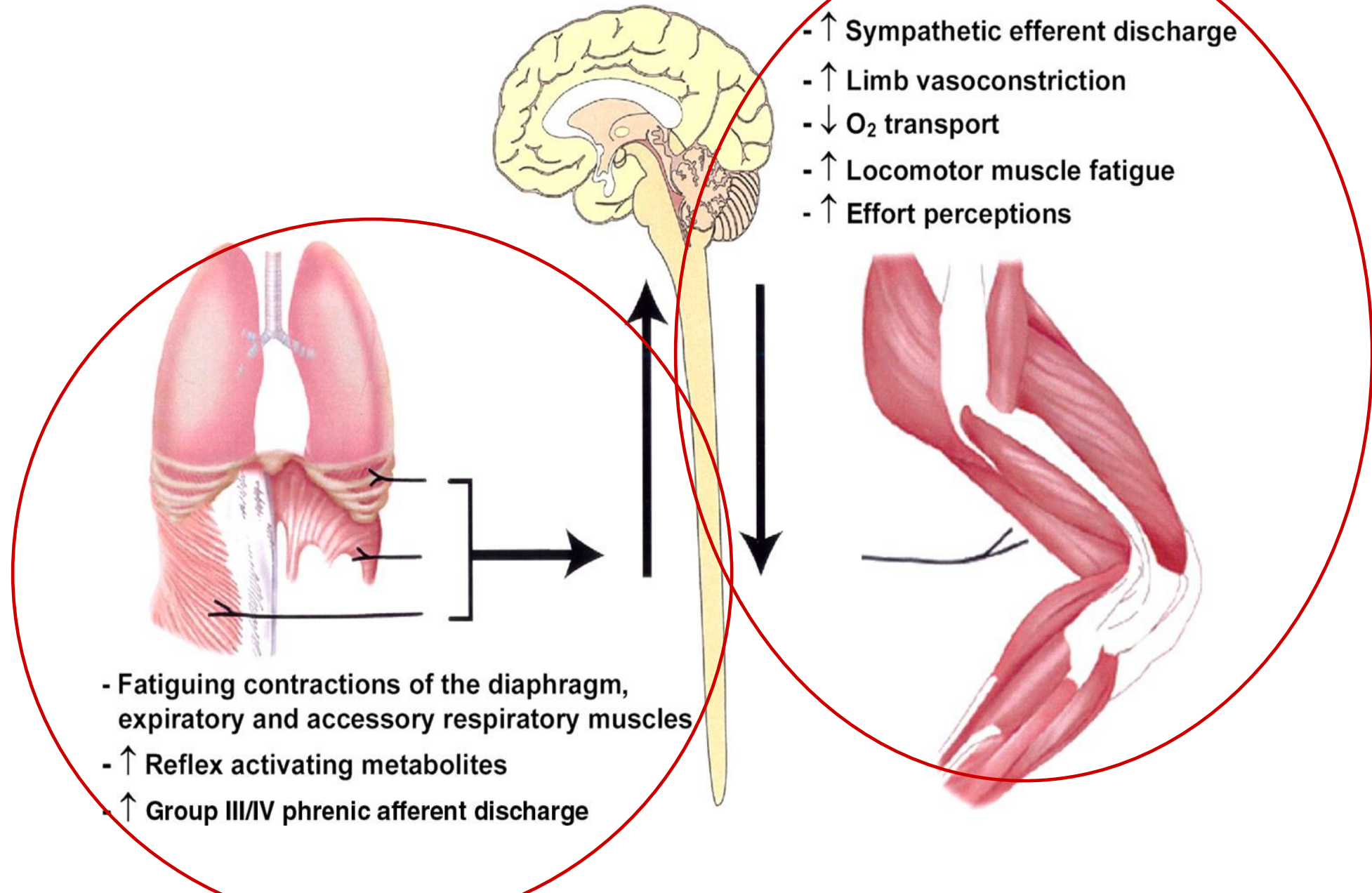
Survival by Maximal Inspiratory Pressure in Heart Failure



Ventilatory Response to Exercise in Heart Failure

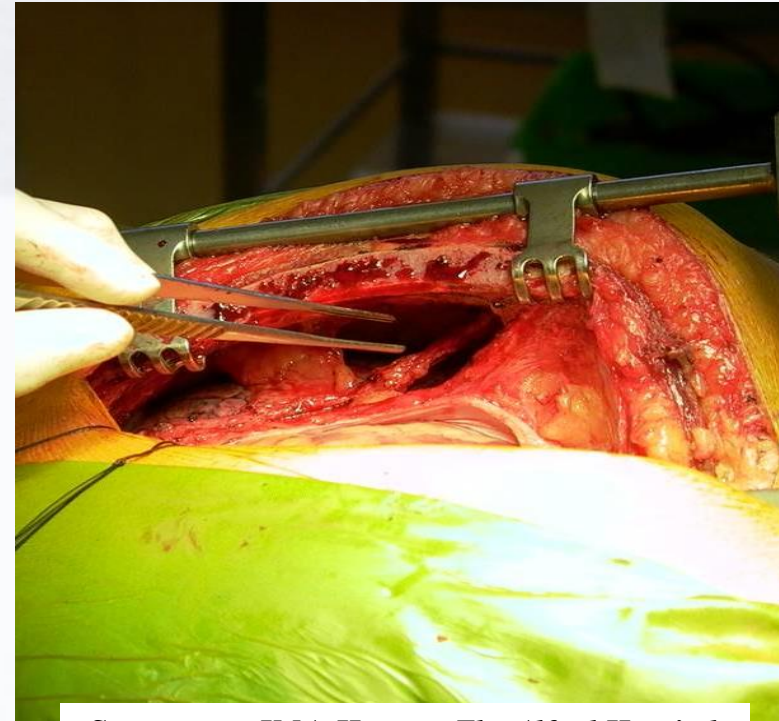


RESPIRATORY MUSCLE METABOREFLEX



Clinical Outcomes

- **Postoperative Pulmonary complications:** 7% (Stiller et al, 1997)
- **Post-sternotomy pain (mod to severe):** 40.1% at 3/12 ; 9.5% at 24/12 months (Choiniere et al, 2014; IASP, 2012)
- **Musculoskeletal problems 30%** (El-Ansary et al, 2000; Stiller et al, 1999)
- **Sternal complications:** 1% to 8%
 - 66% are identified post 6/52 (Robicsek, 2000; Bitkover et al, 1998; El-Ansary et al, 2009)



Sternotomy: IMA Harvest, The Alfred Hospital, Australia

Dysfunctional Breathing Post-Sternotomy

Taylor & Francis
healthsciences

Short-term changes in pulmonary function and respiratory movements after cardiac surgery via median sternotomy

María Ragnarsdóttir¹, Ásdís Kristjánsdóttir¹, Ingvaldur Ingvarsdóttir¹, Pétur Hannesson¹, Bjarni Torfason¹ and Lawrence P. Cahalin²

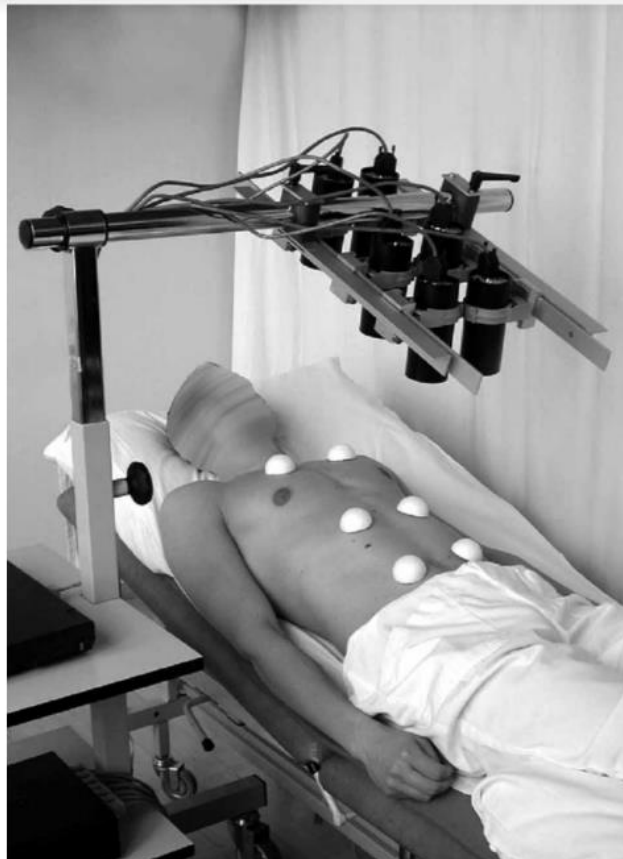


Fig. 2. Placement of the RMMI sensors for measurement of chest wall and abdominal motion.

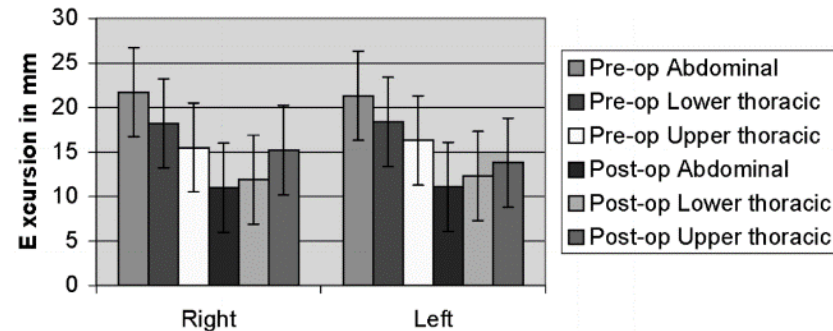


Fig. 5. Average pre- and postoperative respiratory movements. All postoperative movements were significantly diminished ($p < 0.05$) except for the upper right thoracic movements.

Table II. Results from pre- and postoperative lung volume measurements

	Pre-op			7th day post-op			
	Predicted	Measured	Percent predicted (%)	Measured	Percent predicted (%)	Percent measured (%)	p-Value
VC mean \pm SD	3.76 \pm 0.95	3.32 \pm 0.79	88	1.97 \pm 0.56	52.4	59.7	0.000
FVC mean \pm SD	3.60 \pm 0.91	3.17 \pm 0.80	88	1.92 \pm 0.64	53.3	61.2	0.000
FEV ₁ mean \pm SD	2.88 \pm 0.74	2.52 \pm 0.82	88	1.49 \pm 0.53	51.7	61.0	0.000

VC = vital capacity; FVC = forced vital capacity; FEV₁ = forced expiratory volume in 1 s; Percent predicted = measured values in percent of predicted values; Percent measured = measured values on the 7th postoperative day as percent of measured preoperative values; p-Value = p-value of preoperative vs postoperative values.

An Evidence-Based Perspective on Movement and Activity Following Median Sternotomy

Doa El-Ansary, Tanya Kinney LaPier, Jenny Adams, Richard Gach, Susan Triano, Md Ali Katijjahbe, Andrew D. Hirschhorn, Sean F. Mungovan, Ana Lotshaw, Lawrence P. Cahalin

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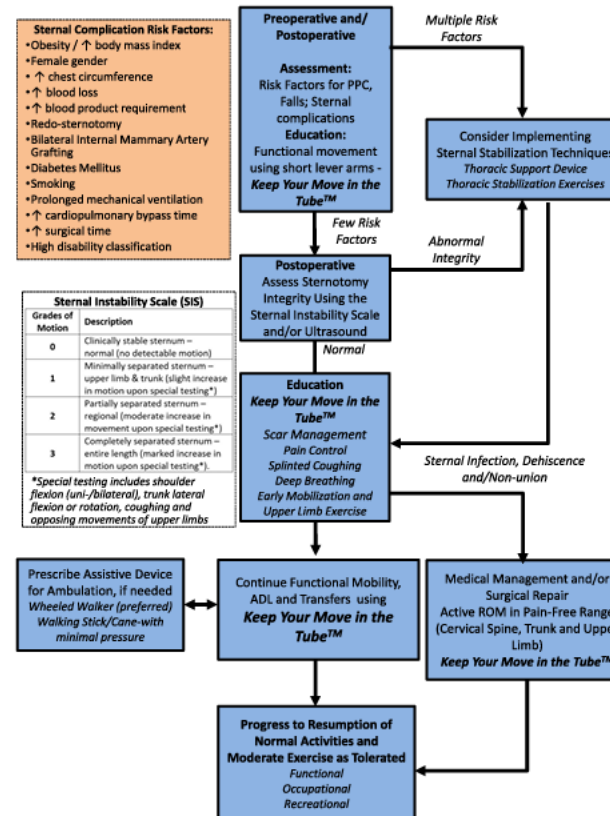


Figure 1. Summary of steps in the physical therapy management of patients with a median sternotomy. ADL = activities of daily living; ROM = range of motion.

Preoperative Intensive Inspiratory Muscle Training to Prevent Postoperative Pulmonary Complications in High-Risk Patients Undergoing CABG Surgery

A Randomized Clinical Trial

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Paul J. M. Helders, PT, PhD
Nine J. Favié, PT, MSc
Rob A. De Bie, PT, PhD
Aart Brutel de la Riviere, MD, PhD
Nico L. U. Van Meeteren, PT, PhD

Context Postoperative pulmonary complications (PPCs) after coronary artery bypass graft (CABG) surgery are a major source of morbidity and mortality, and increase length of hospital stay and resource utilization. The prehospitalization period before CABG surgery may be used to improve a patient's pulmonary condition. The efficacy of preoperative inspiratory muscle training (IMT) in reducing the incidence of PPCs in high-risk patients undergoing CABG surgery has not yet been determined.

Objective To evaluate the prophylactic efficacy of preoperative IMT on the incidence of PPCs in high-risk patients scheduled for elective CABG surgery.



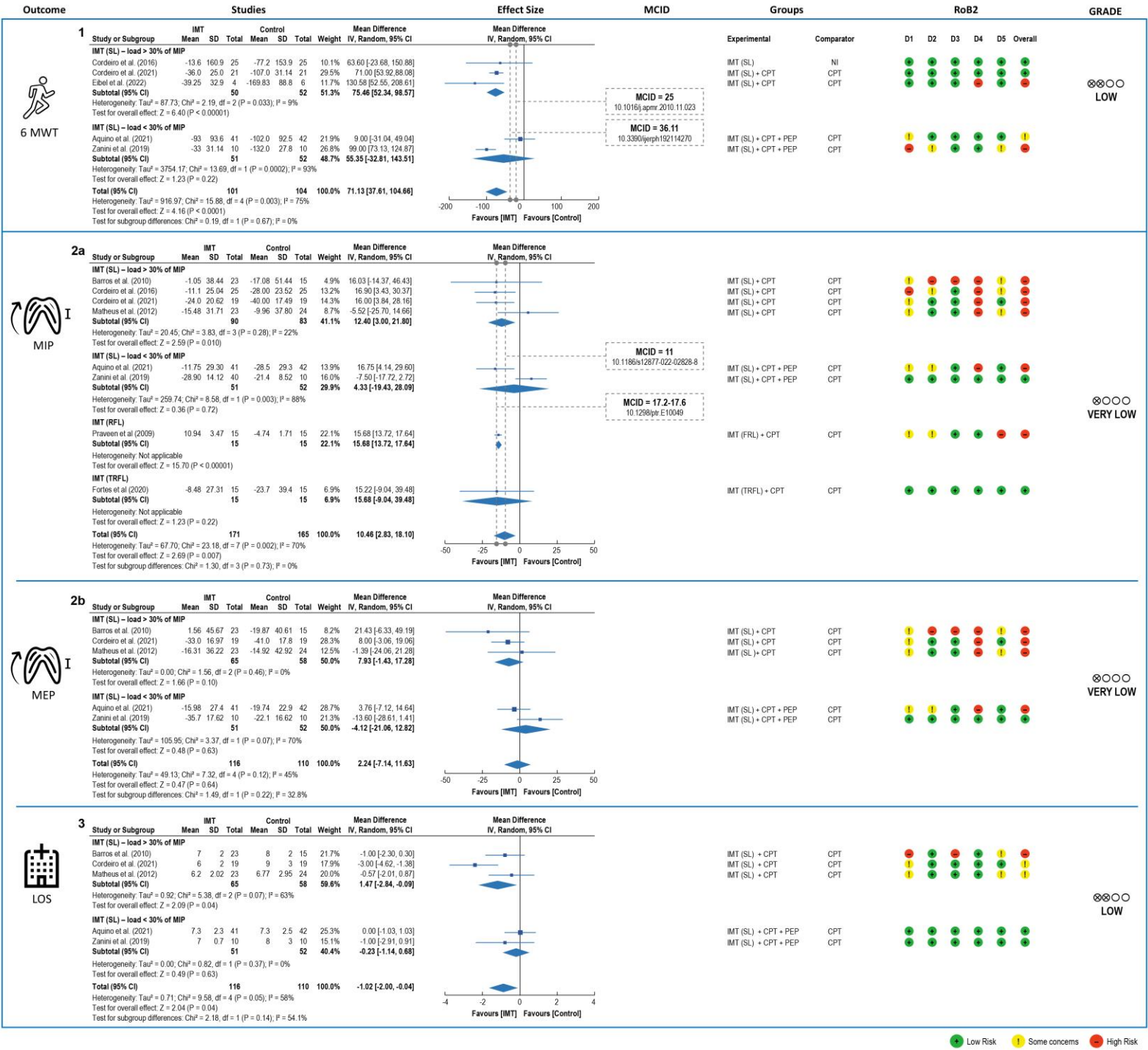
Daily IMT at least 2 weeks before surgery at 30% of MIP which was incrementally progressed by 5% if Borg RPE < 5/10 during IMT

IMT was performed for a mean of 30 days (range=14-90 days) with significantly greater MIP (81±29 cm H₂O to 95.6±31.6 cm H₂O) and inspiratory muscle endurance (49±16% to 56±15%).

Table 2. Duration of Postoperative Hospitalization and Level of PPCs Between the IMT and Usual Care Groups*

Outcome	IMT Group (n = 139)	Usual Care Group (n = 137)	Odds Ratio (95% CI)	P Value
Duration of postoperative hospitalization, median (range), d	7 (5-41)	8 (6-70)		.02
Level of PPC				
Grade 1	114 (82.0)	89 (65.0)	1.90 (1.09-3.38)	.02
Grade 2	14 (10.1)	18 (13.1)	0.63 (0.41-0.95)	.02
Grade 3	10 (7.2)	24 (17.5)	0.44 (0.23-0.84)	.01
Grade 4	1 (0.7)	6 (4.4)	0.20 (0.02-1.64)	.09
PPC grade ≥2	25 (18.0)	48 (35.0)	0.52 (0.30-0.92)	.02
Pneumonia	9 (6.5)	22 (16.1)	0.40 (0.19-0.84)	.01

Abbreviations: CI, confidence interval; IMT, inspiratory muscle training; PPC, postoperative pulmonary complication.
*Data are presented as number (percentage) unless otherwise specified.



Effect of Inpatient Inspiratory Muscle Training on 6MWT & MID

Outcome

Studies

Effect Size

MCID

Groups Description

RoB2

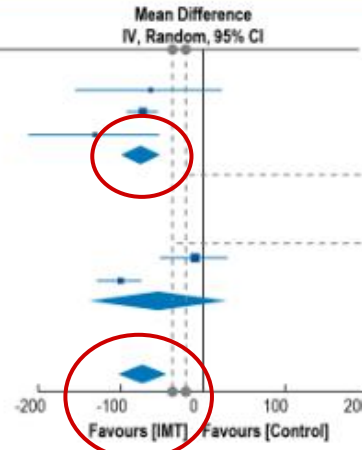
GRADE^a



6 MWT

1

Study or Subgroup	IMT Mean SD Total	Control Mean SD Total	Weight	Mean Difference IV, Random, 95% CI
IMT (SL) – load > 30% of MIP				
Cordeiro et al. (2016)	-13.6 160.9 25	-77.2 153.9 25	10.1%	63.60 [-23.68, 150.88]
Cordeiro et al. (2021)	-36.0 25.0 21	-107.0 31.14 21	29.5%	71.00 [53.92, 88.08]
Eibel et al. (2022)	-39.25 32.9 4	-169.83 88.8 6	11.7%	130.58 [52.55, 208.61]
Subtotal (95% CI)	50	52	51.3%	75.46 [52.34, 98.57]
Heterogeneity: $\tau^2 = 87.73$; $\chi^2 = 2.19$, $df = 2$ ($P = 0.033$); $I^2 = 9\%$ Test for overall effect: $Z = 6.40$ ($P < 0.00001$)				
IMT (SL) – load < 30% of MIP				
Aquino et al. (2021)	-93 93.6 41	-102.0 92.5 42	21.9%	9.00 [-31.04, 49.04]
Zanini et al. (2019)	-33 31.14 10	-132.0 27.8 10	26.8%	99.00 [73.13, 124.87]
Subtotal (95% CI)	51	52	48.7%	55.35 [-32.81, 143.51]
Heterogeneity: $\tau^2 = 3754.17$; $\chi^2 = 13.69$, $df = 1$ ($P = 0.0002$); $I^2 = 93\%$ Test for overall effect: $Z = 1.23$ ($P = 0.22$)				
Total (95% CI)	101	104	100.0%	71.13 [37.61, 104.66]
Heterogeneity: $\tau^2 = 916.97$; $\chi^2 = 15.88$, $df = 4$ ($P = 0.003$); $I^2 = 75\%$ Test for overall effect: $Z = 4.16$ ($P < 0.0001$) Test for subgroup differences: $\chi^2 = 0.19$, $df = 1$ ($P = 0.67$); $I^2 = 0\%$				



MCID = 25
10.1016/j.apmr.2010.11.023

MCID = 36.11
10.3390/jerph192114270

Experimental

Comparator

D1 D2 D3 D4 D5 Overall

IMT (SL)

ND

IMT (SL) + CPT

CPT

IMT (SL) + CPT

CPT

IMT (SL) + CPT + PEP

CPT

IMT (SL) + CPT + PEP

CPT

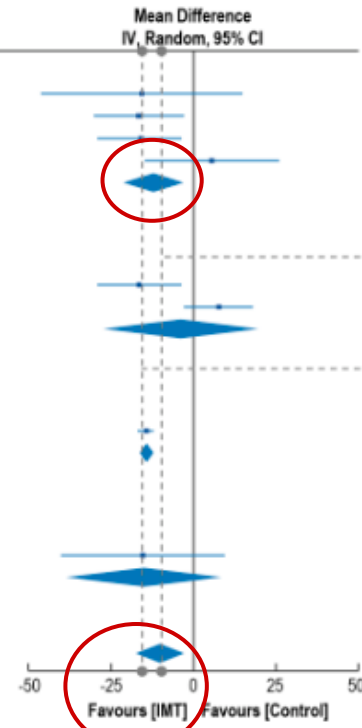
⊗⊗⊙⊙
LOW

2a



MIP

Study or Subgroup	IMT Mean SD Total	Control Mean SD Total	Weight	Mean Difference IV, Random, 95% CI
IMT (SL) – load > 30% of MIP				
Barros et al. (2010)	-1.05 38.44 23	-17.08 51.44 15	4.9%	16.03 [-14.37, 46.43]
Cordeiro et al. (2016)	-11.1 25.04 25	-28.00 23.52 25	13.2%	16.90 [3.43, 30.37]
Cordeiro et al. (2021)	-24.0 20.62 19	-40.00 17.49 19	14.3%	16.00 [3.84, 28.16]
Matheus et al. (2012)	-15.48 31.71 23	-9.96 37.80 24	8.7%	-5.52 [-25.70, 14.66]
Subtotal (95% CI)	90	83	41.1%	12.40 [3.00, 21.80]
Heterogeneity: $\tau^2 = 20.45$; $\chi^2 = 3.83$, $df = 3$ ($P = 0.28$); $I^2 = 22\%$ Test for overall effect: $Z = 2.59$ ($P = 0.010$)				
IMT (SL) – load < 30% of MIP				
Aquino et al. (2021)	-11.75 29.30 41	-28.5 29.3 42	13.9%	16.75 [4.14, 29.60]
Zanini et al. (2019)	-28.90 14.12 40	-21.4 8.52 10	16.0%	-7.50 [-17.72, 2.72]
Subtotal (95% CI)	51	52	29.9%	4.33 [-19.43, 28.09]
Heterogeneity: $\tau^2 = 259.74$; $\chi^2 = 8.58$, $df = 1$ ($P = 0.003$); $I^2 = 88\%$ Test for overall effect: $Z = 0.36$ ($P = 0.72$)				
IMT (RFL)				
Praveen et al (2009)	10.94 3.47 15	-4.74 1.71 15	22.1%	15.68 [13.72, 17.64]
Subtotal (95% CI)	15	15	22.1%	15.68 [13.72, 17.64]
Heterogeneity: Not applicable Test for overall effect: $Z = 15.70$ ($P < 0.00001$)				
IMT (TRFL)				
Fortes et al (2020)	-8.48 27.31 15	-23.7 39.4 15	6.9%	15.22 [-9.04, 39.48]
Subtotal (95% CI)	15	15	6.9%	15.68 [-9.04, 39.48]
Heterogeneity: Not applicable Test for overall effect: $Z = 1.23$ ($P = 0.22$)				
Total (95% CI)	171	165	100.0%	10.46 [2.83, 18.10]
Heterogeneity: $\tau^2 = 67.70$; $\chi^2 = 23.18$, $df = 7$ ($P = 0.002$); $I^2 = 70\%$ Test for overall effect: $Z = 2.69$ ($P = 0.007$) Test for subgroup differences: $\chi^2 = 1.30$, $df = 3$ ($P = 0.73$); $I^2 = 0\%$				



MCID = 11
10.1186/s12877-022-02828-8

MCID = 17.2-17.6
10.1298/jptr.E10049

IMT (SL) + CPT

CPT

IMT (SL) + CPT

CPT

IMT (SL) + CPT

CPT

IMT (SL) + CPT

CPT

IMT (SL) + CPT + PEP

CPT

IMT (SL) + CPT + PEP

CPT

IMT (RFL) + CPT

CPT

IMT (TRFL) + CPT

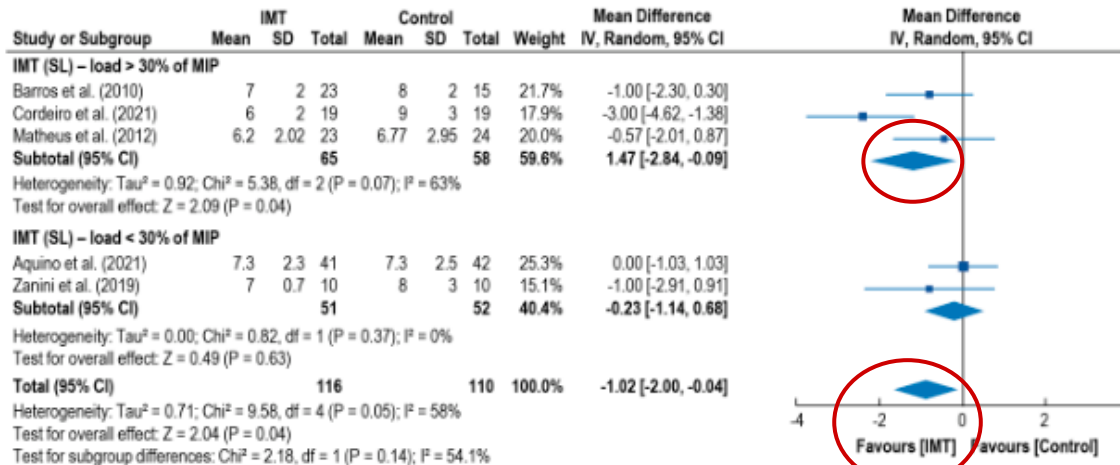
CPT

⊗⊙⊙⊙
VERY LOW

Effect of Inpatient Inspiratory Muscle Training on Length of Stay



3



IMT (SL) + CPT
IMT (SL) + CPT
IMT (SL) + CPT

CPT
CPT
CPT

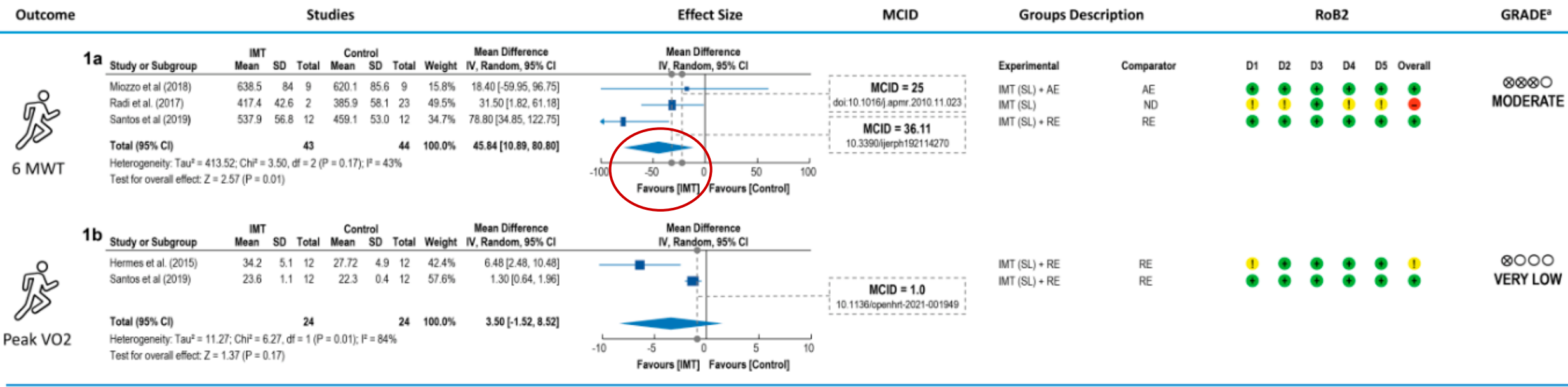


IMT (SL) + CPT + PEP
IMT (SL) + CPT + PEP

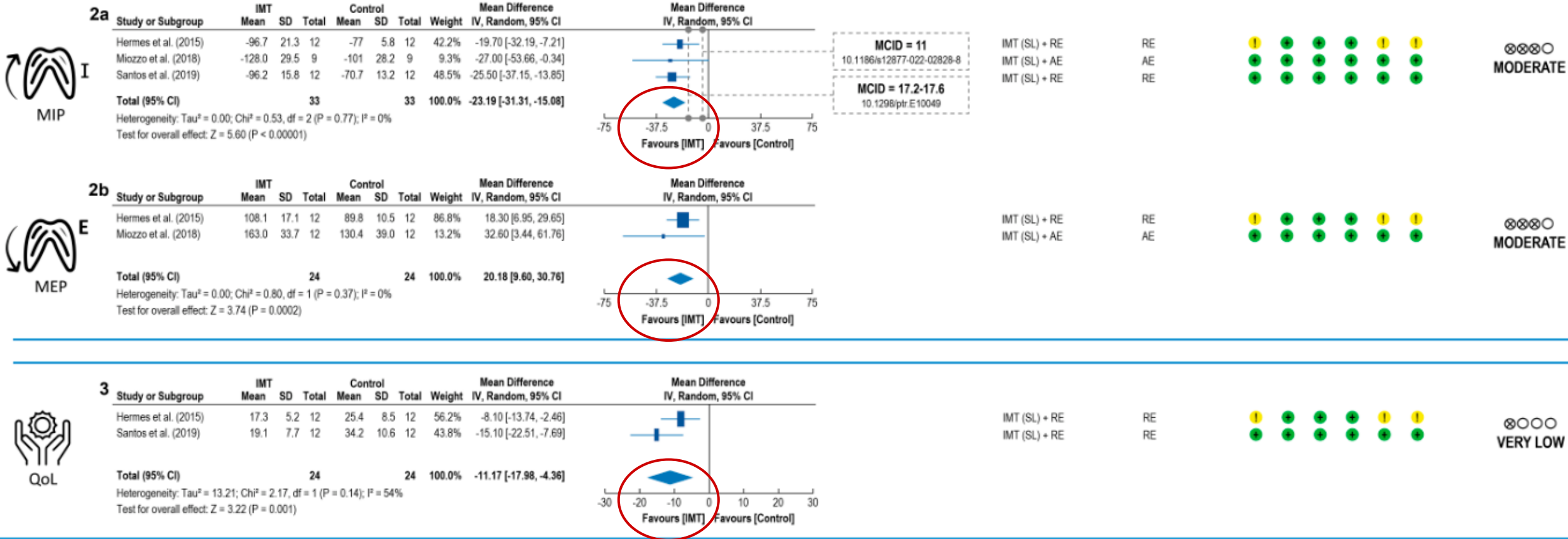
CPT
CPT



Effect of Outpatient Inspiratory Muscle Training on 6MWT and Peak VO2



Effect of Outpatient Inspiratory Muscle Training on MIP, MEP & Quality of Life

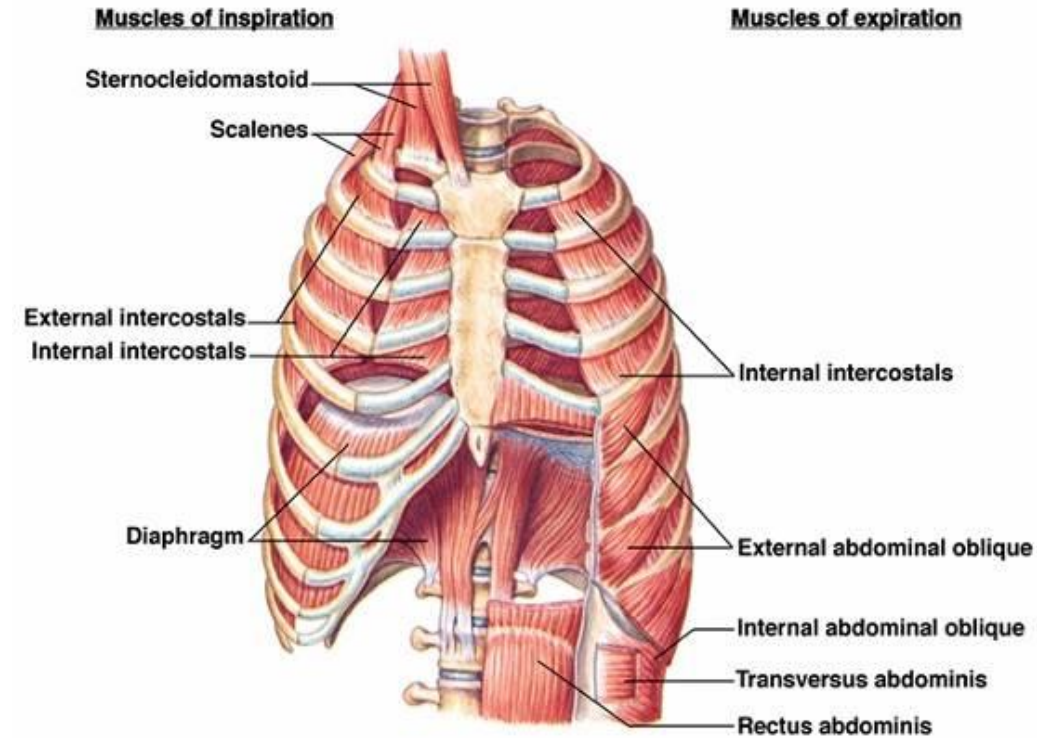


YouTube and Am. Phys. Therapy Assoc. Links for Respiratory Muscle Training Material

- <https://www.youtube.com/playlist?list=PLne40lpTInF62gkGJYkRvty0Mzfxect2g&app=desktop>
- <https://learningcenter.apta.org/student/mycourse.aspx?id=f4b7ebc7-bdbd-4808-814c-c875c8aee805>

Respiratory Muscles and Respiratory Muscle Training

- Composed of all 3 muscle fibers
 - Slow-twitch oxidative
 - Fast-twitch oxidative glycolytic
 - Fast-twitch glycolytic
- Adult diaphragm: ~55% slow twitch fibers
- Disease and disuse can alter the % fiber type
 - Eliciting more slow twitch fibers and less fast-twitch
 - ✓ **Yielding more endurance and less strength**
 - ✓ **Producing a respiratory sarcopenia**
- **Respiratory muscle training** can improve respiratory muscle strength, power, & endurance
 - ✓ Yielding more efficient & effective breathing, gas exchange, and numerous physiologic and functional performance outcomes



Thank You!!

L.Cahalin@Miami.edu





Surgical Pause Symposium



Prehabilitation of Veterans with Exercise & Nutrition (PREVENT)

Preliminary results of a multimodal, tele-supervised prehabilitation intervention for patients undergoing high-risk surgery

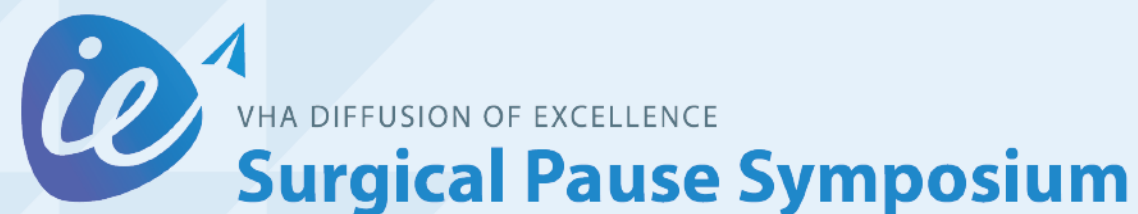
Atilio Barbeito MD MPH
VA Health Care System
Department of Anesthesiology
Duke University Health System
Durham, NC



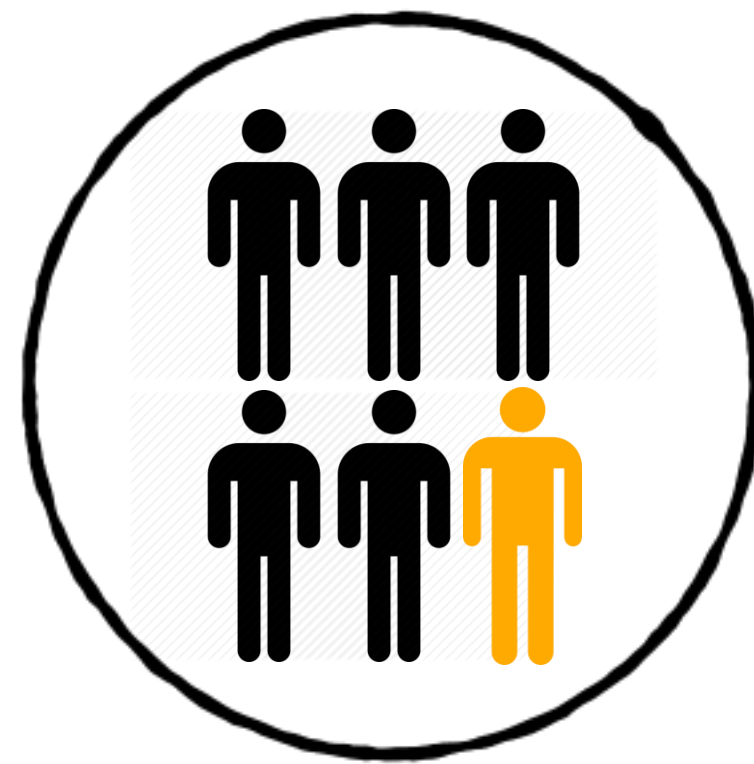
This work was sponsored by the Office of Rehabilitation Research & Development in the Department of Veterans Affairs (SPiRE RX 19-003)

Outline

- Background
 - Why Prehabilitation?
 - Why Multimodal (exercise + nutrition)?
 - Why tele-supervised?
- Study design
- Results to date
- Next steps



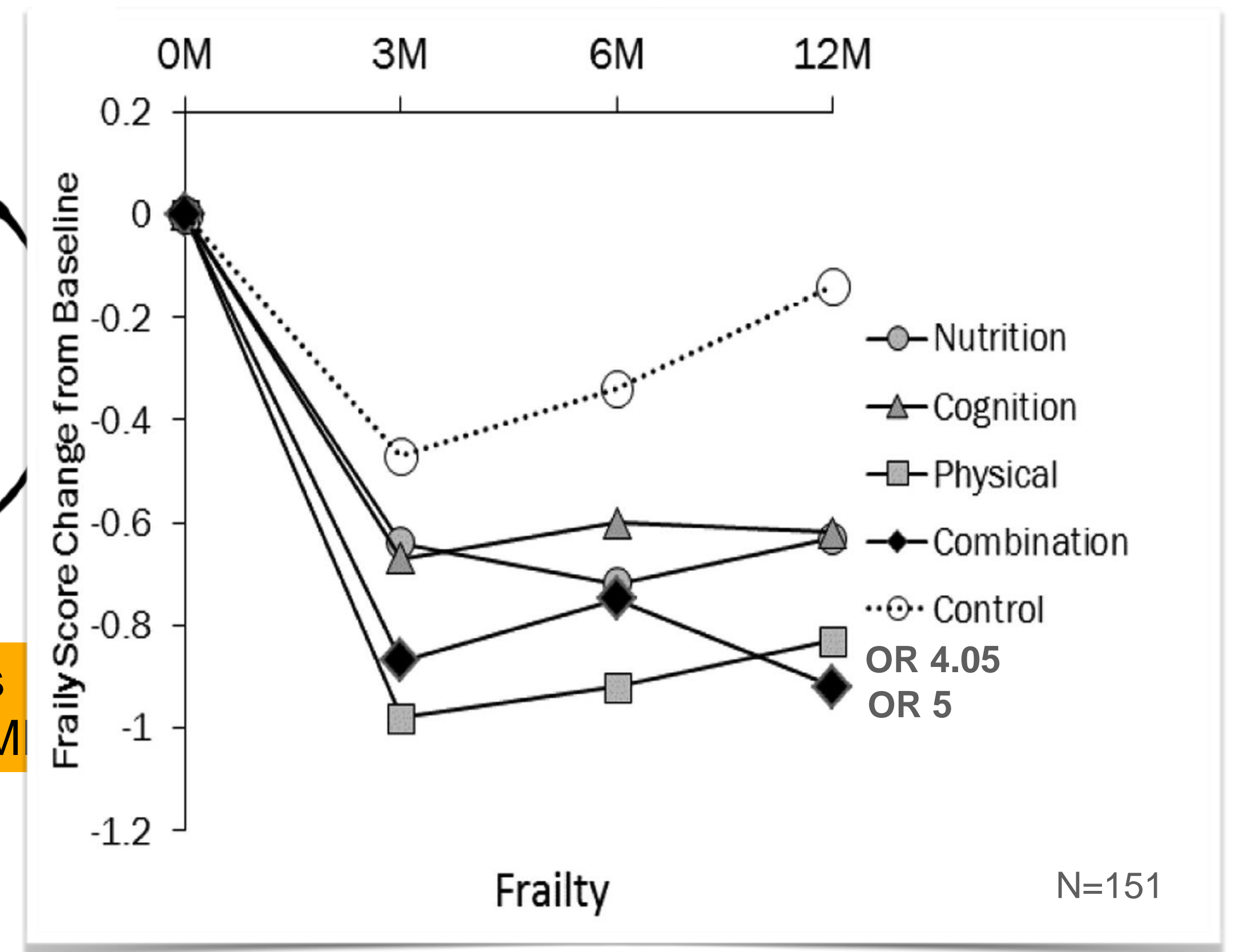
Why Prehabilitation?



1:6 community dwellers
over 60 are FRAIL



Frailty impacts
surgical OUTCOM



Frailty is prevalent, influences surgical outcomes, and is reversible with exercise!

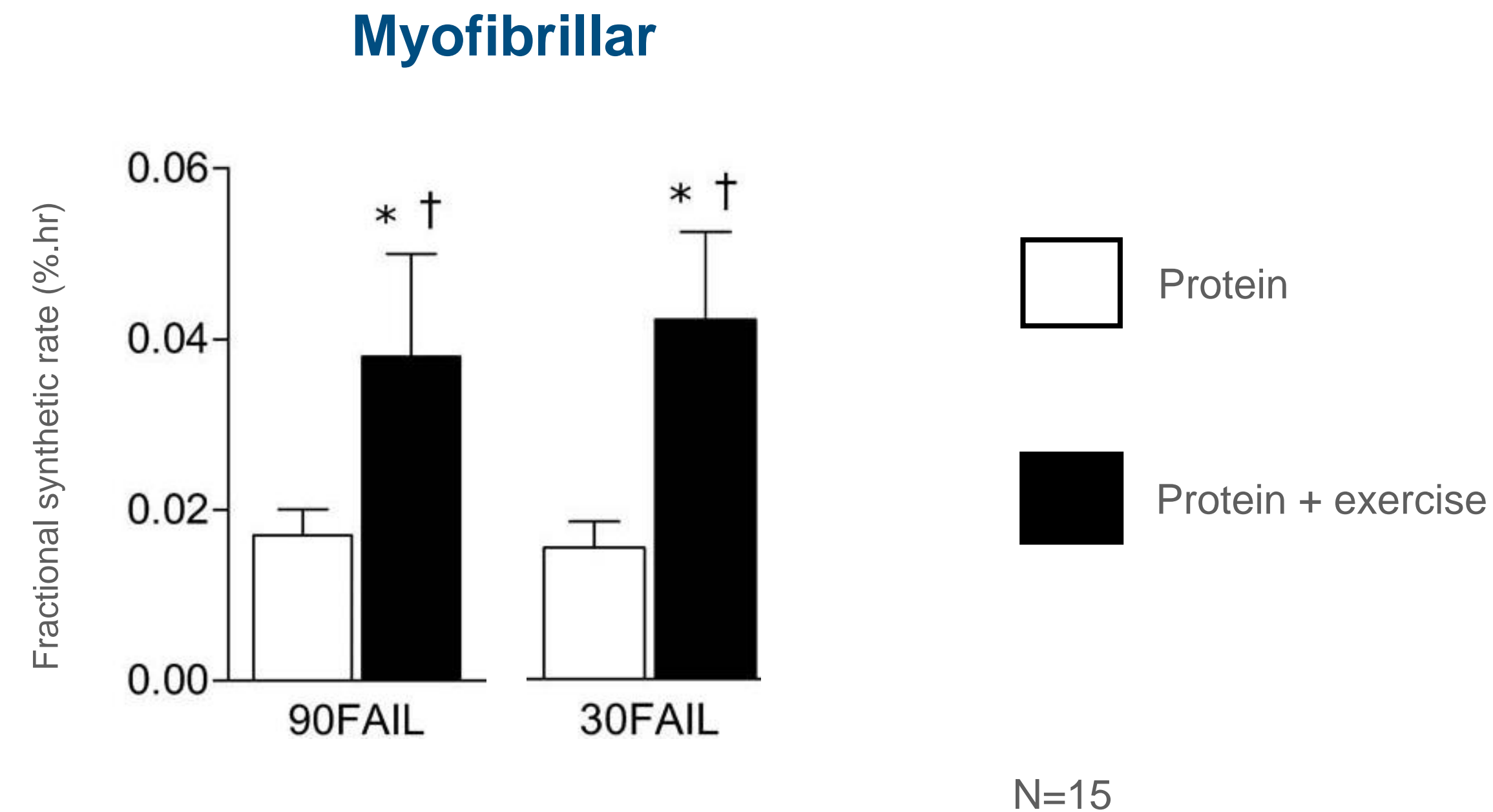
A global clinical measure of fitness and frailty in elderly people. CMAJ. 2005;173:489–495.

Frailty and perioperative outcomes: a narrative review. Can J Anesth. 2015;62:143–157.

Nutritional, Physical, Cognitive, and Combination Interventions and Frailty Reversal Among Older Adults: A Randomized Controlled Trial. Am J Med 2015, 128 (11): 1225-1236.e1

Why Multimodal (nutrition + exercise)?

Change in rates of **muscle protein synthesis** following 15gm of protein



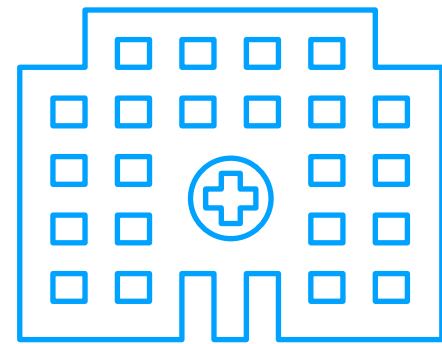
Nutrition is key component of prehabilitation, because it works synergistically with exercise

Why Tele-supervised?

Supervised
high intensity, high compliance

Driving 3x week

HOSPITAL



HOME



No driving

Unsupervised
lower intensity, lower compliance

TELE-SUPERVISED



'Tele-supervision' may improve accessibility and compliance while ensuring adequate training intensity

Randomized clinical trial of prehabilitation in colorectal surgery. *Br J Surg.* 2010;97(8):1187-1197.

Preoperative therapeutic programme for elderly patients scheduled for elective abdominal oncological surgery: a randomized controlled pilot study. *Clin Rehabil.* 2010;24(7):614-622.

Prehabilitation versus rehabilitation: a randomized control trial in patients undergoing colorectal resection for cancer. *Anesthesiology.* 2014;121(5):937-947.

Effect of prehabilitation on objectively measured physical fitness after neoadjuvant treatment in preoperative rectal cancer patients: a blinded interventional pilot study. *Br J Anaesth.* 2015;114(2):244-251.

PREVENT

Study Aims

Aim 1

To test the acceptability, feasibility, and safety of a multimodal, tele-supervised prehabilitation intervention in frail older patients undergoing high-risk surgery

Acceptability = acceptance rate

Feasibility = adherence rates

Safety = number of safety events

Aim 2

Determine effect sizes for outcomes of interest

The PREVENT Team



Leigh Ann Yeager
Exercise Physiology



Miriam Morey PhD
**Physical Medicine
& Rehabilitation**



Katheryn Starr PhD RD
Nutrition



Shelley cDonald MD
Geriatrics



Karthik Raghunathan MD MPH
Anesthesiology



Becky Schroeder MD MMCI
Anesthesiology



Jeanna Blitz MD
Anesthesiology



Sandhya Lagoo MD PhD
Surgery

Patient population

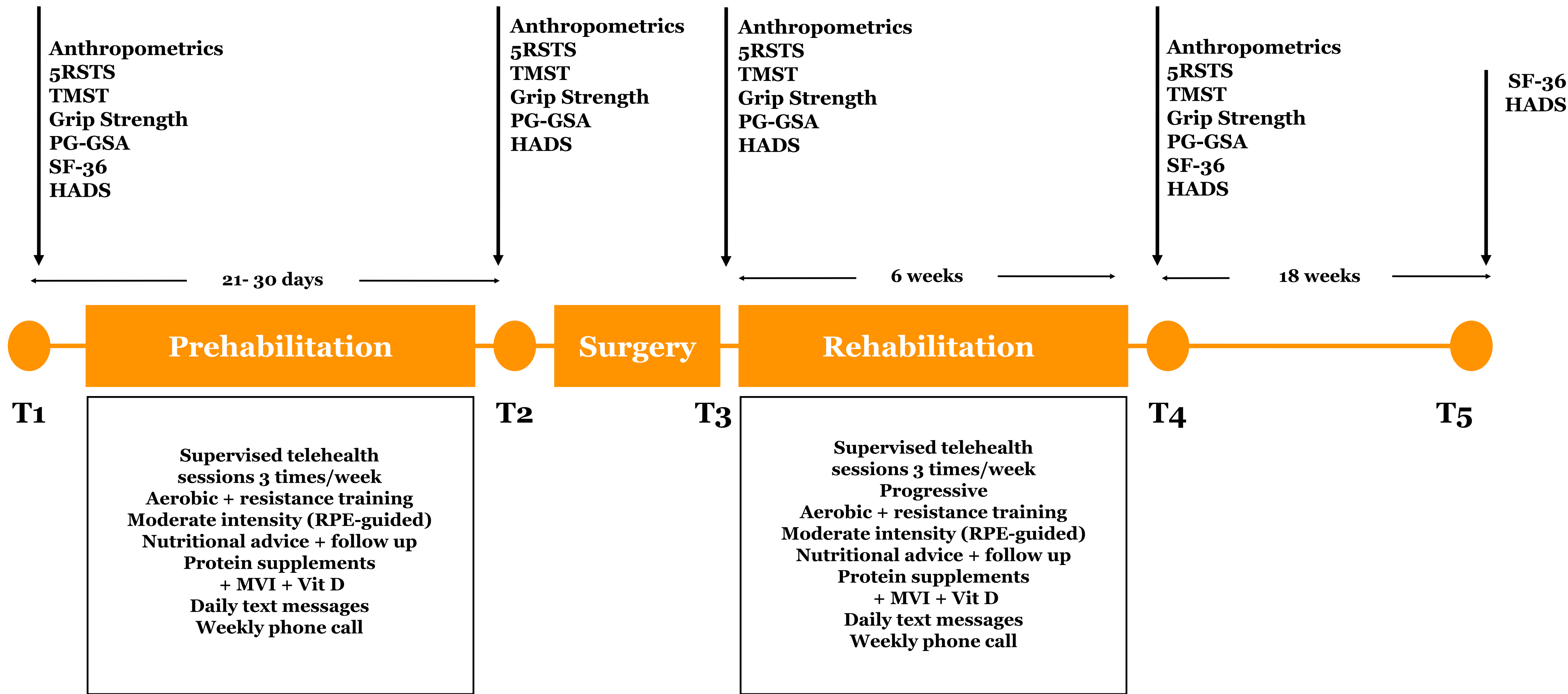
Inclusion Criteria

- Scheduled for high-risk surgery
- Time from assessment to surgery ≥ 21 days
- Age ≥ 50 years
- English speaking
- 5XSTS time ≥ 11 sec and/or 2MST score $\leq 25\%$ percentile for gender/age

Exclusion Criteria

- A score of <21 (high school edu.) or <20 (less than high school education) on the Montreal Cognitive Assessment (MoCA)
- Dementia diagnosis
- Inability to complete physical function assessment
- ASA categories 4 and 5
- Living in skilled nursing facility
- No access to a telephone or internet
- Advanced chronic kidney disease (KDIGO stage 4 and 5)

Study Design

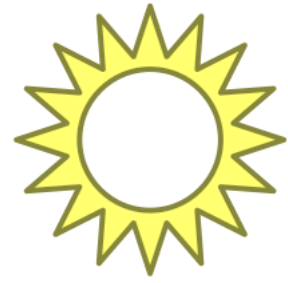


Exercise Routine

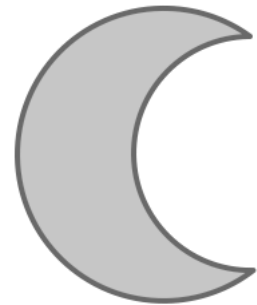
Warm-up	5 min	2-3 RPE **
Aerobic and Resistance Exercise Circuit	30 min *	Aerobic: 4-6 RPE Resistance: 6-7 RPE
Cool down	5 min	2-3 RPE

* *The duration of the circuit will be progressed towards the 30 minute goal*

** *RPE = rate of perceived exertion*



Hi there, it's Annie. Don't forget to join your exercise class today!



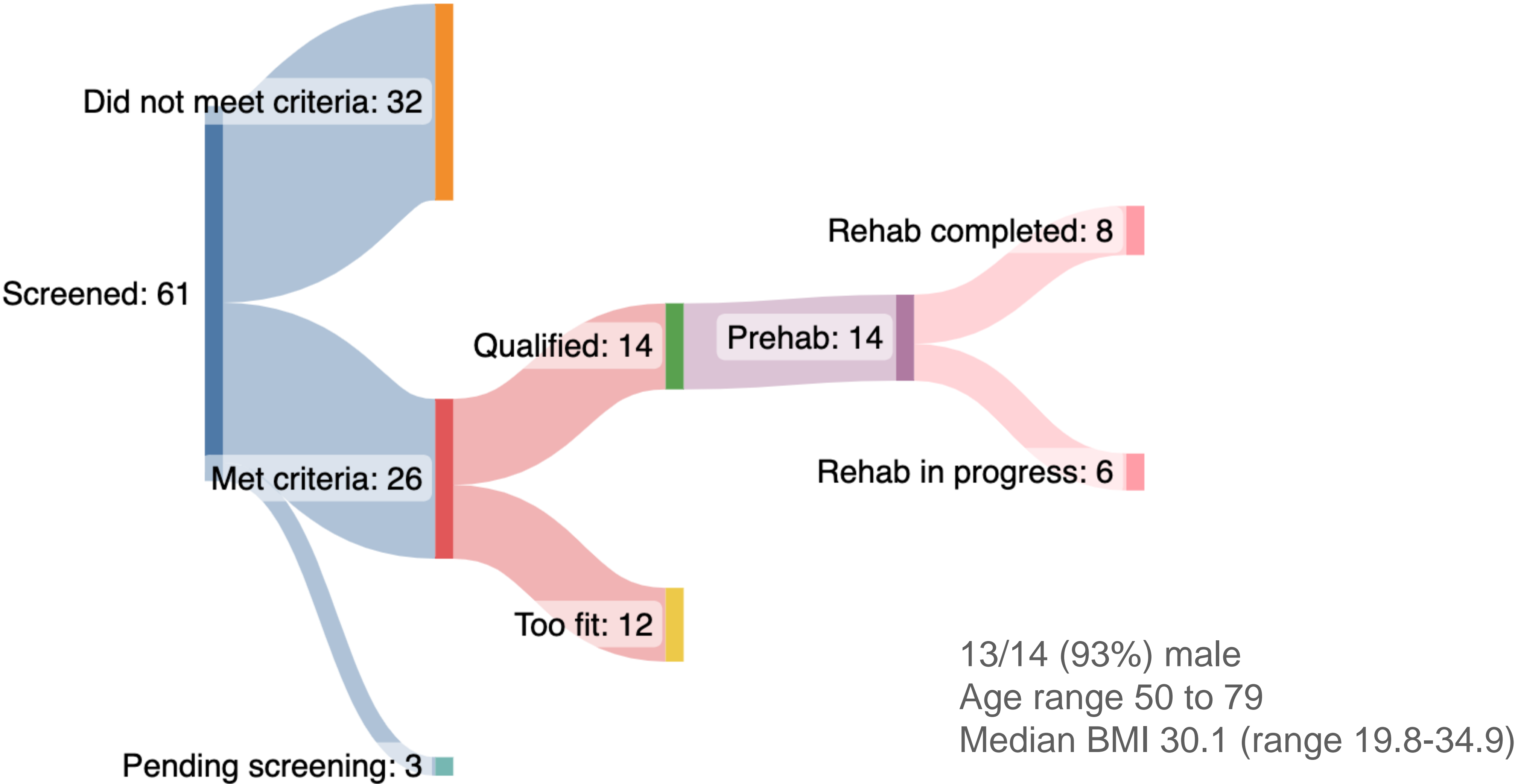
It's Annie checking on you, how many protein supplements did you take today? Reply like this: PRO 1 if you had one supplement, PRO 2 if you had two. etc.

PRO 2

Great job! Exercise plus nutrition is the formula for building strong muscles!

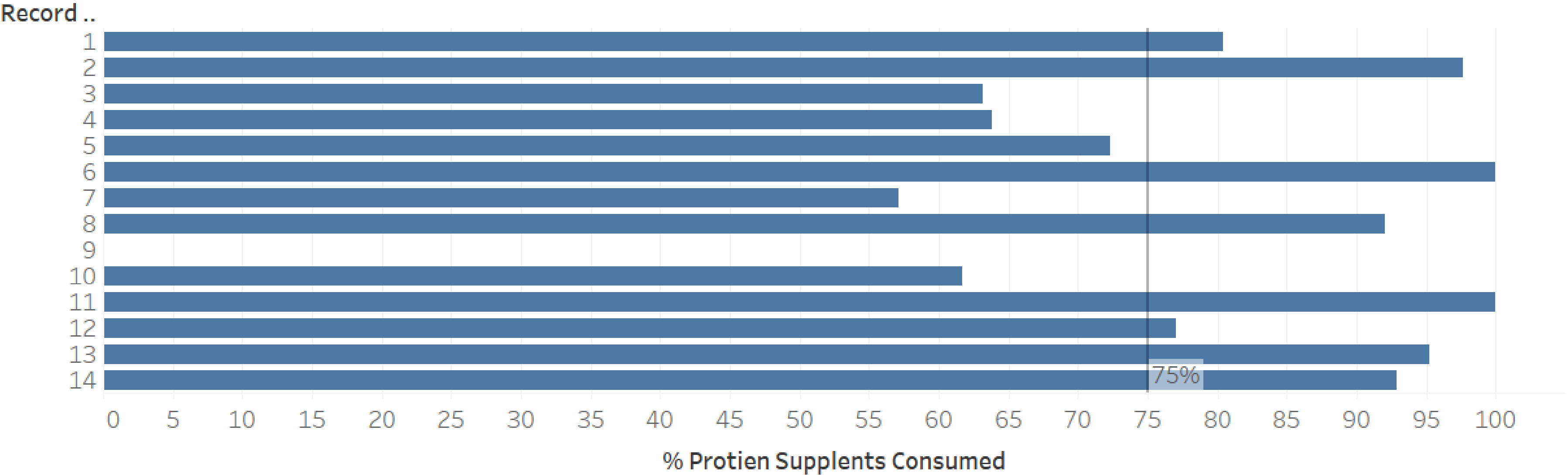
Feasibility Results

Acceptance



Acceptability Results

Adherence to Nutritional Intervention



PROTEIN

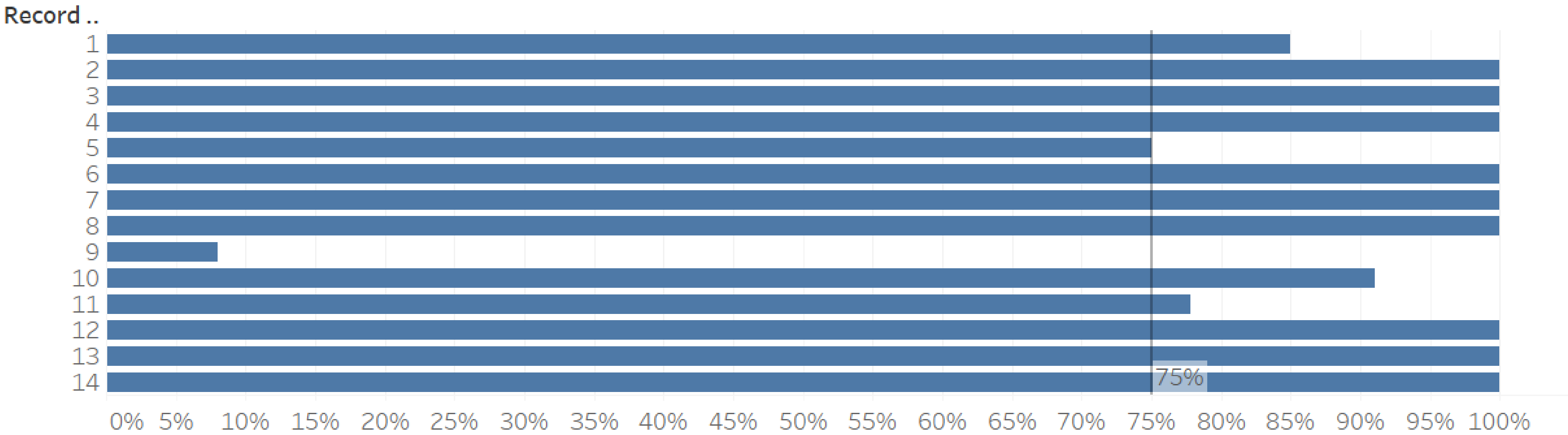
57%

(8/14)

COMPLIANCE
≥75% of the supplements consumed

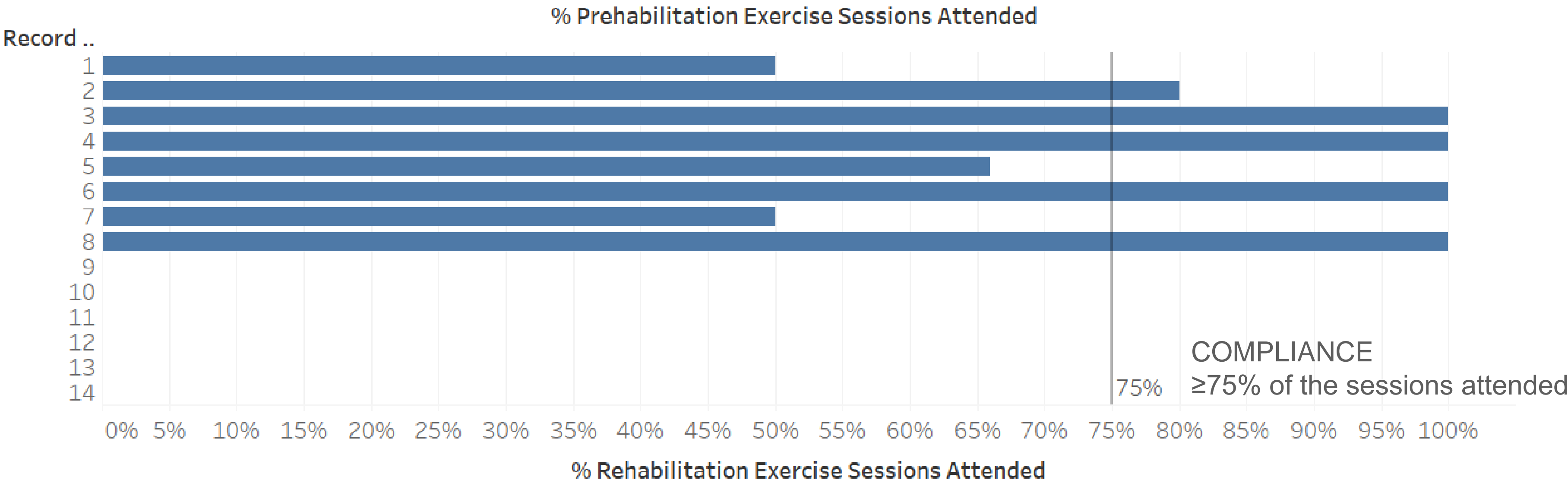
Acceptability Results

Adherence to Exercise Intervention



PREHAB

85%
(12/14)

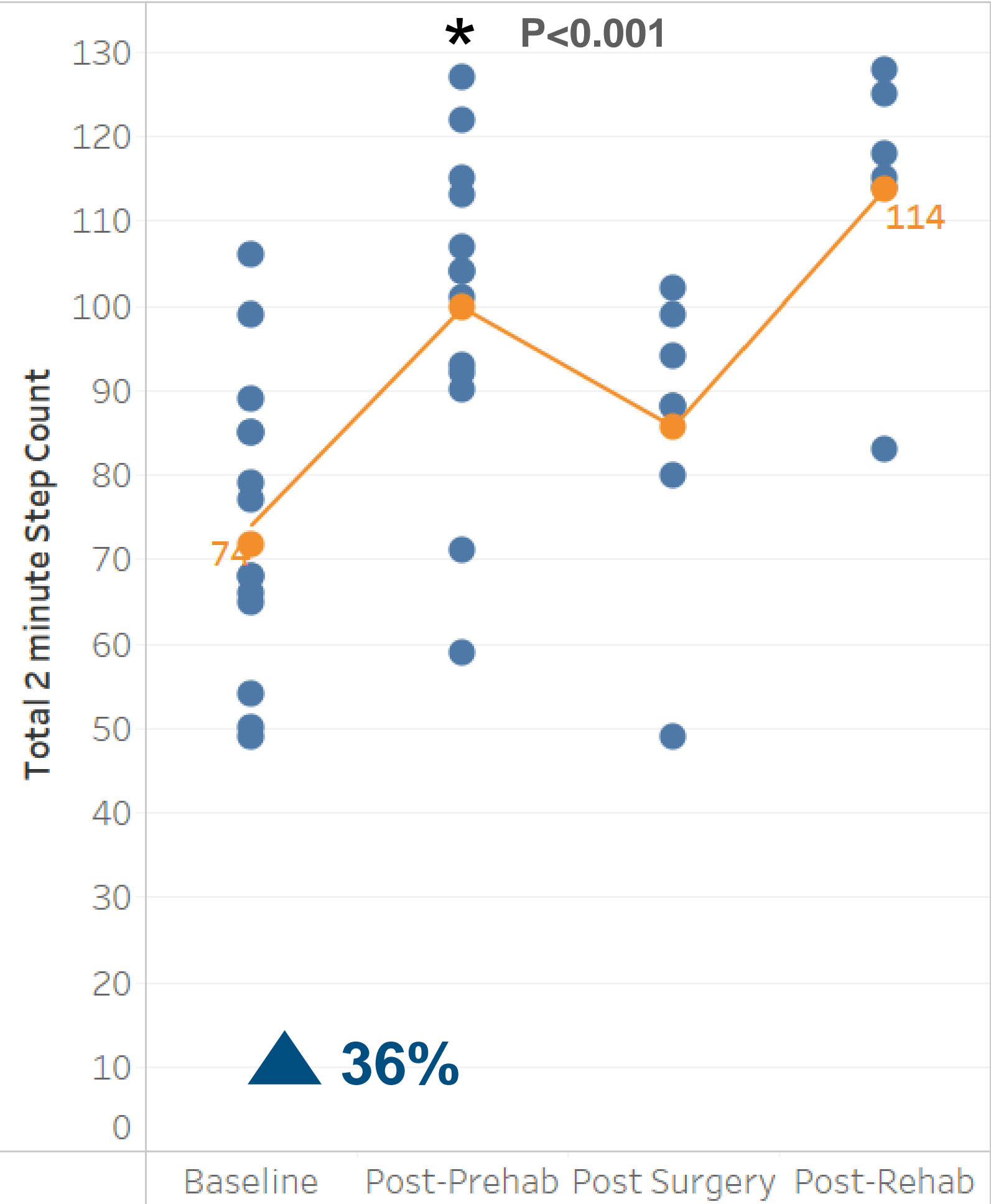


REHAB

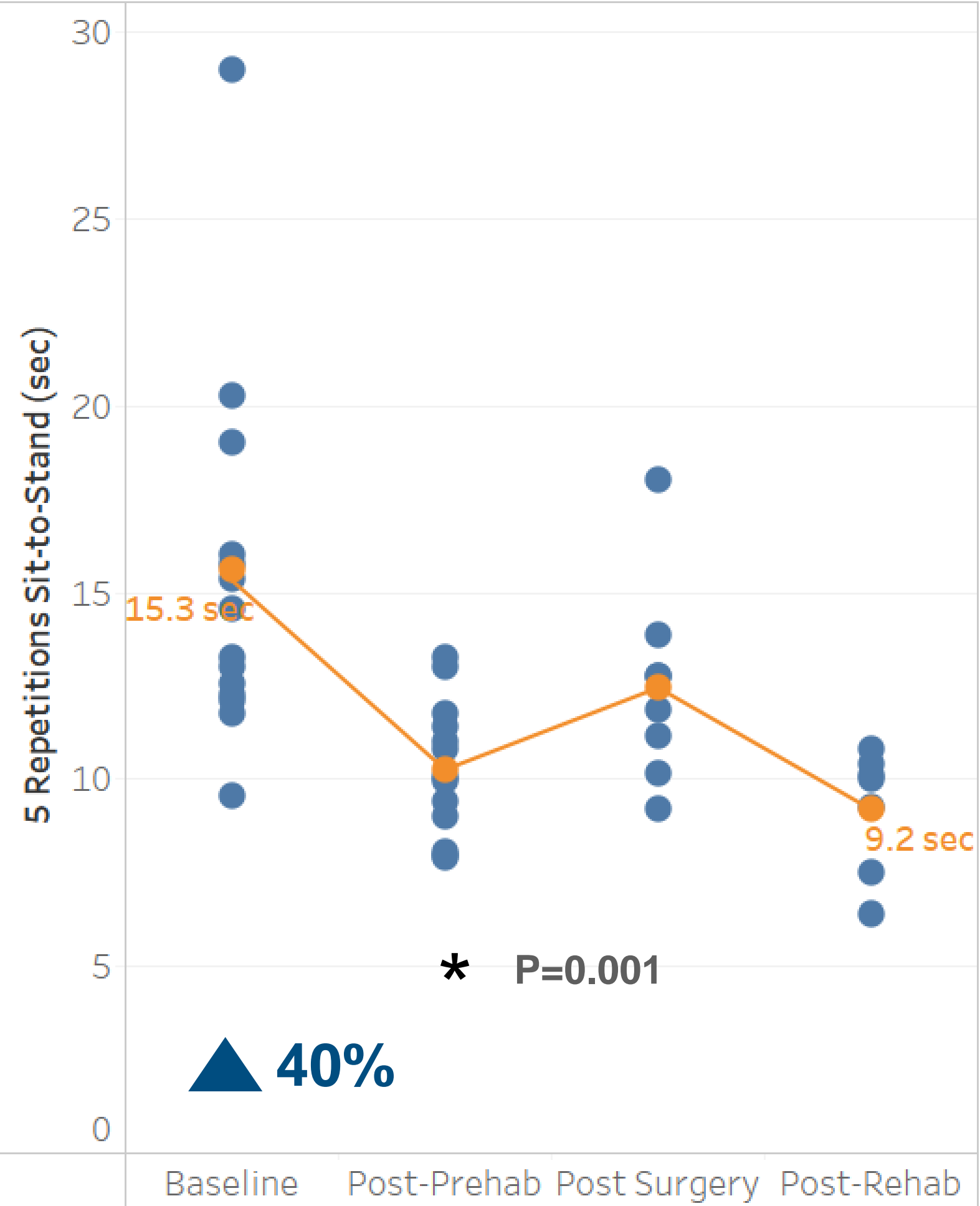
45%
(5/9)

Fitness Trajectories

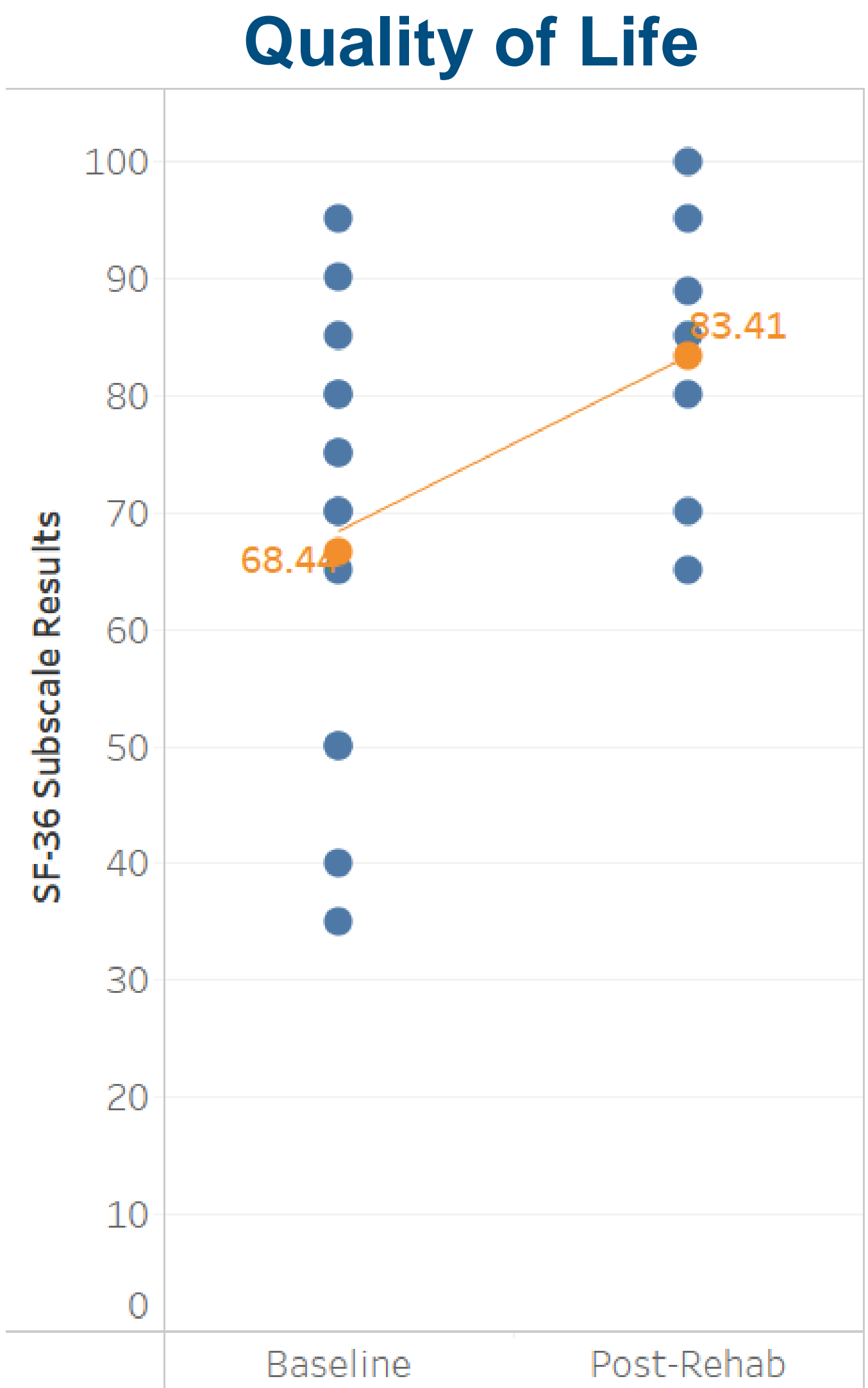
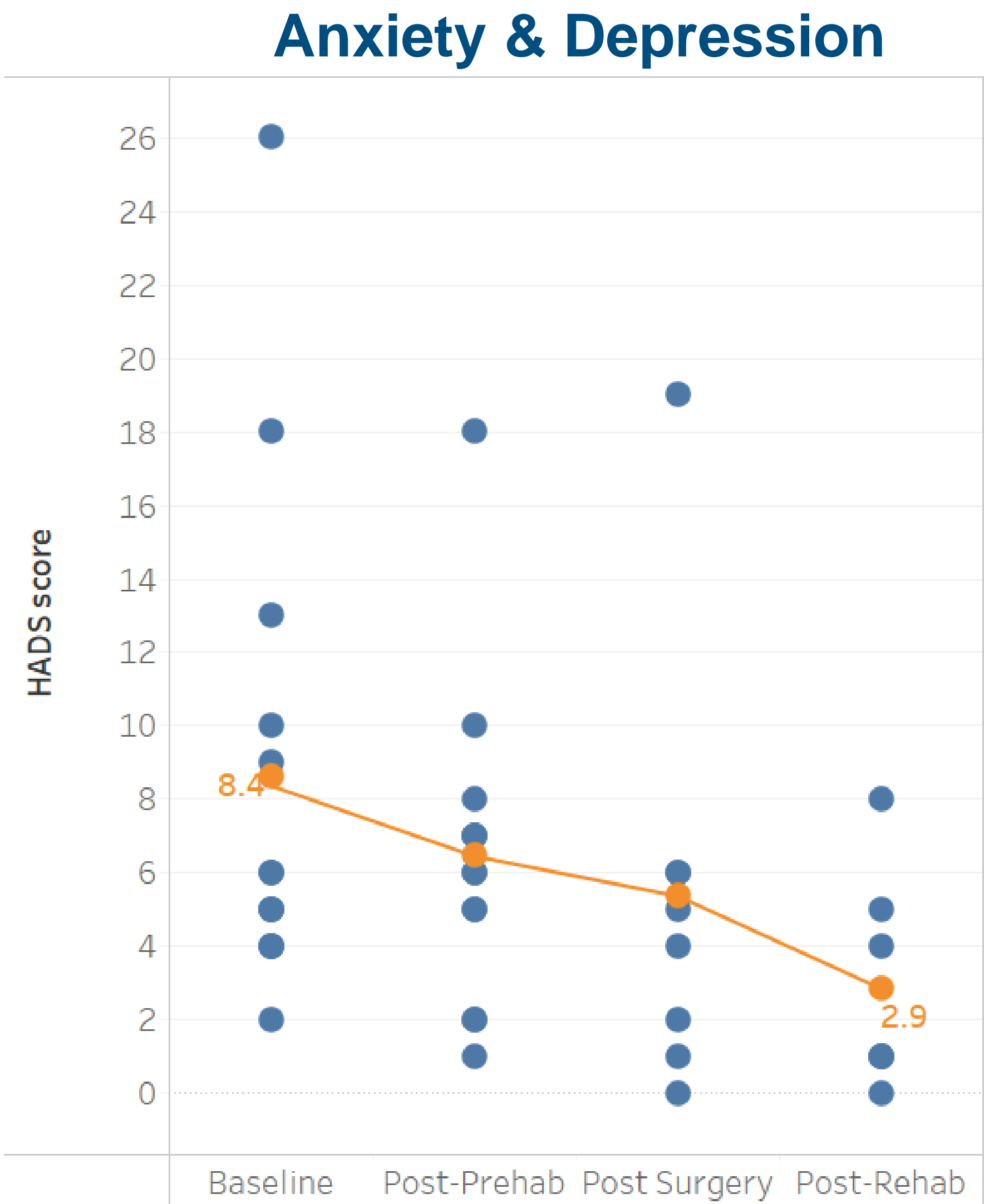
2-minute Step Test



5 Repetition Sit-to-Stand Test



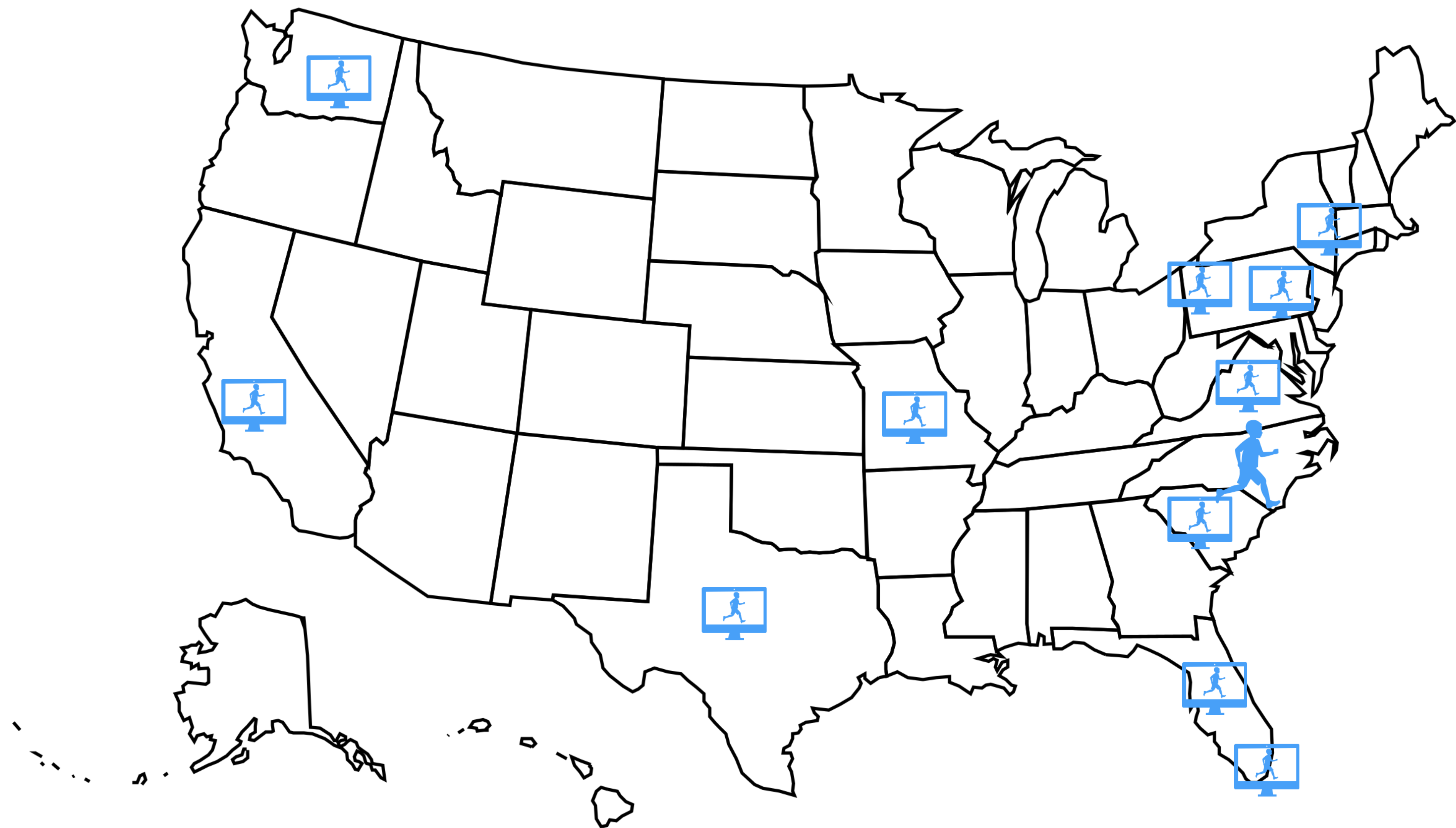
Mental Health & QOL Trajectories



Conclusions

- A tele-supervised rehabilitation intervention is safe, feasible and acceptable among veterans undergoing high-risk surgery
- A 3-week prehab intervention results in 36-40% gains in fitness
- The rehabilitation phase is also effective
- Improvements in anxiety and QoL scores

Next Steps



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Surgical Pause Symposium



Integration of Frailty into Decision Making: the Geriatrician's Perspective

Ariela R. Orkaby, MD, MPH

Geriatrics & Preventive Cardiology

New England GRECC, VA Boston Healthcare System

Brigham & Women's Hospital

Assistant Professor of Medicine, Harvard Medical School



Disclosures

Funding: NIH, VA

Consulting: Anthos Therapeutics



Frailty in Acute Cardiology: Comparison of a Quick Clinical Assessment Against a Validated Frailty Assessment Tool



Timothy B.K. Hii, MBCHB*, John G. Lainchbury, MBChB
Paul G. Bridgman, MD

Table 4 Inter-observer agreement

Observer
Registrar
Consultant 1
Consultant 2
Consultant 1
Consultant 2
Consultant 1



Cohen's kappa
0.1545
0.0428
0.2558
Cohen's kappa
0.7281
0.2131
Cohen's kappa
0.5417

In this table, all variables are reported as number (% within total). Cohen's kappa is used to assess REFS-observer agreement, as well as inter-observer agreement. Larger kappa indicates greater similarity. Generally, a Kappa > 0.70 is considered satisfactory.



The Clinical Frailty Scale Upgrade Your Eyeball Test

Editorial

Gait Speed Assessment in Transcatheter Aortic Valve Replacement A Step in the Right Direction

Jonathan Afilalo, MD, MSc; Daniel E. Forman, MD

Clinical Frailty Scale*



1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



2 Well – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.



3 Managing Well – People whose **medical problems are well controlled**, but are **not regularly active** beyond routine walking.



4 Vulnerable – While **not dependent** on others for daily help, often **symptoms limit activities**. A common complaint is being “slowed up”, and/or being tired during the day.



5 Mildly Frail – These people often have **more evident slowing**, and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



6 Moderately Frail – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.



7 Severely Frail – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.



9. Terminally Ill - Approaching the end of life. This category applies to people with a **life expectancy <6 months**, who are **not otherwise evidently frail**.

Scoring frailty in people with dementia

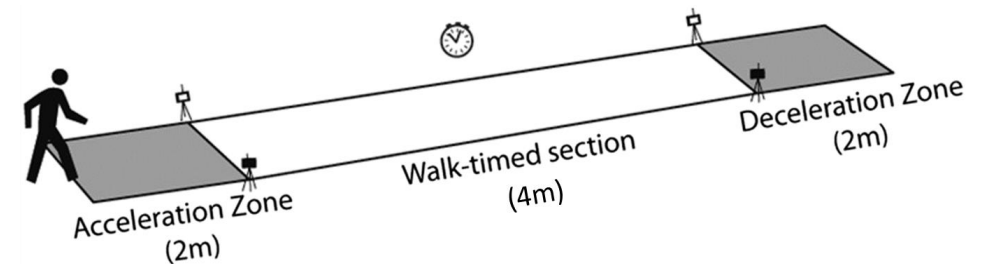
The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

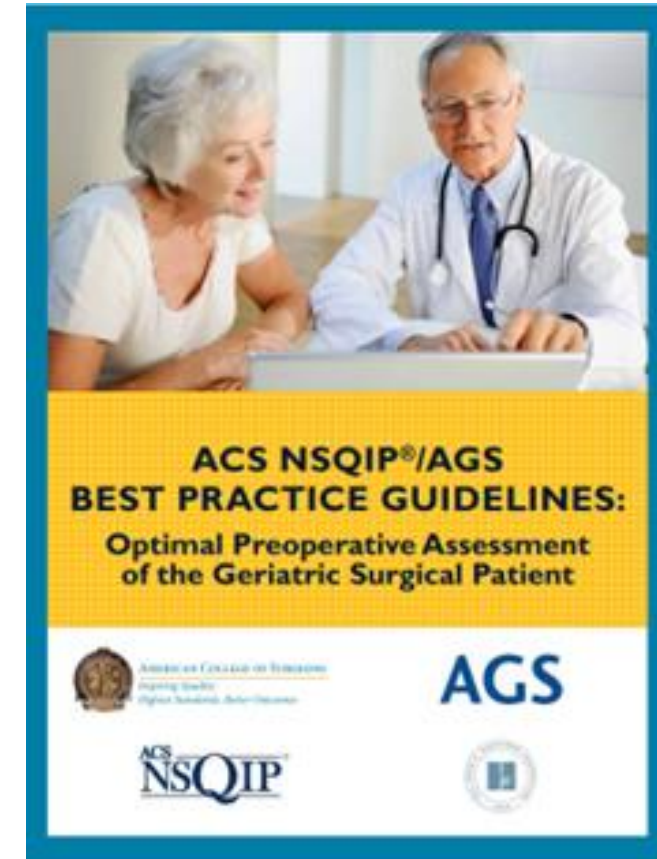
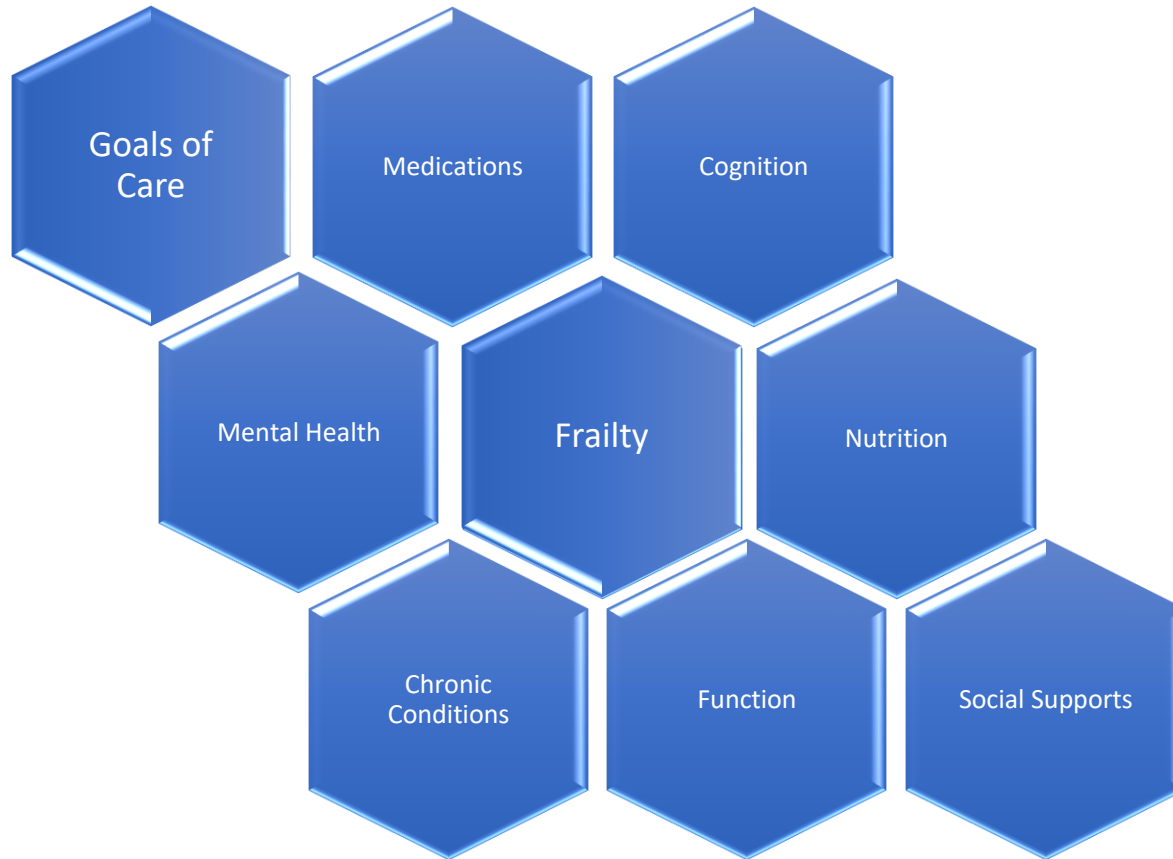
© 2007-2009 Version 1.2. All rights reserved. Geriatric Medicine Research, Dalhousie University, Halifax, Canada. Permission granted to copy for research and educational purposes only.



Afilalo J. Circulation 2017.

Afilalo J & Forman DE. Circ Cardiovasc Interv 2017.

Frailty has been part of the recommended pre-procedural Geriatric Assessment for over a decade



Partridge JSL et al. Anaesthesia. 2013.
NSQIP/AGS Best Practice Guidelines.

Mrs. R: 86F with severe Aortic Stenosis

PMH: Atherosclerosis of the aorta, HFpEF, HTN, HL, and “multiple non-cardiac chronic conditions”

ROS: Reports: dyspnea on exertion, unsteadiness with near fall, forgetfulness

Denies: fatigue, weight loss, depression

Social: Widowed, lives alone with children nearby, Independent in ADLs, has help with medication and money management (IADLs)

Her concerns:

Will I feel better after surgery? Will my memory be ok?

Medications:

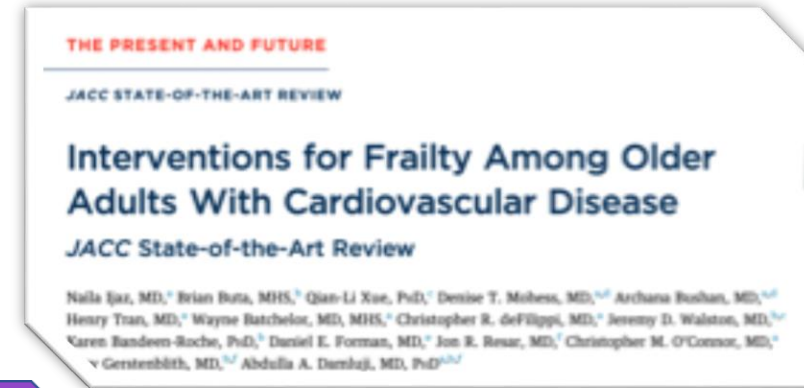
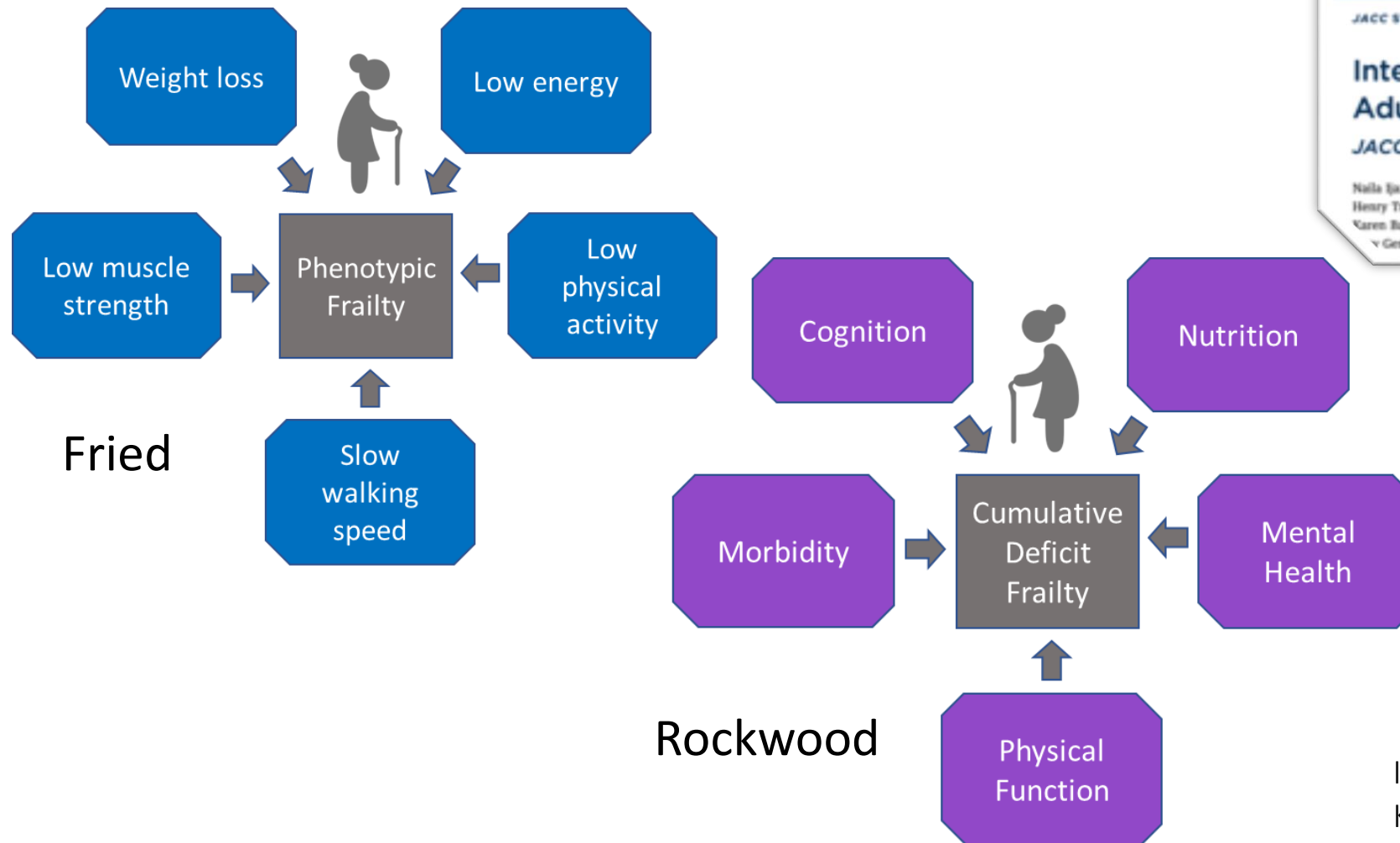
Atorvastatin
Furosemide
Famotidine
Metoprolol
Oxybutinin
Vit D + Ca
Acetaminophen prn

Vitals:

BP 136/64, HR 68
BMI 28.67 kg/m²



Two conceptual models: >60 tools to measure frailty



Ijaz N, et al. JACC. 2022.
Ko D, et al. Curr Cardiol Rep. 2023.

Veterans are older and sicker: an automated FI may be useful for population health



2002-2012:
~3 million veterans ≥ 65 ,
regular VA users

VA-FI domains:

1. Morbidity
2. Cognition & Mood
3. Function
4. Sensory impairment
5. Other

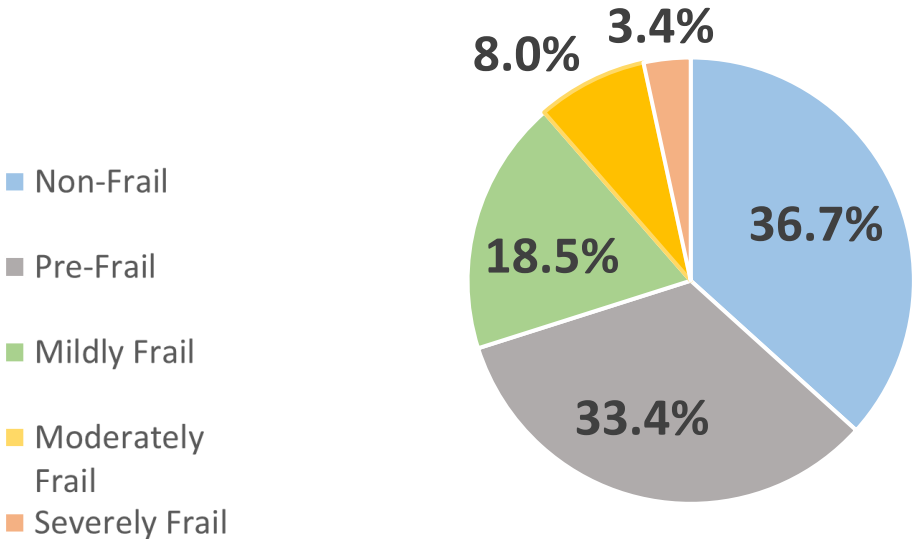


31-item VA-FI using VA claims and augmented with Medicare data

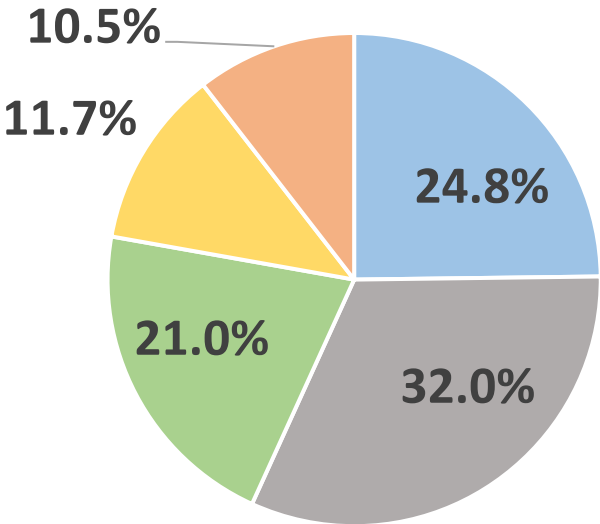
Orkaby et al. J Gerontol A Biol Sci Med Sci. 2019.

Frailty increased by 50% from 2002 to 2012 in US Veterans ≥65

Prevalence of Frailty 2002: 30%
N=1,606,750
Mean age 75, 98% male



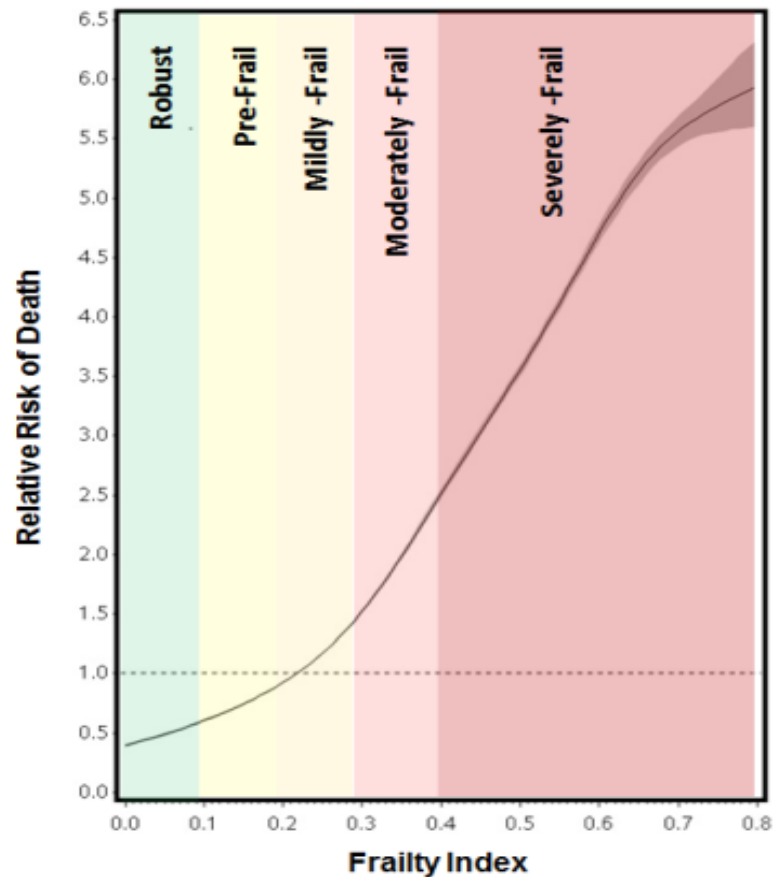
Prevalence of Frailty in 2018: 43%
N=2,359,207
Mean age 76, 97% male



Orkaby et al. J Gerontol A Biol Sci Med Sci. 2019.
Cheng ... Orkaby. J Gerontol A Biol Sci Med Sci. 2021.

The VA-FI identifies those at increased risk of mortality and can reset life expectancy estimates

2-yr risk of all-cause mortality
2012-14



2002		Median Survival Time (Years)				
		Men			Women	
Frailty Score	Age	Age	Age	Age	Age	Age
	65-74	75-84	≥85	65-74	75-84	≥85
≤0.1	13.0	10.4	6.4	19.2	11.6	7.4
>0.1 - ≤0.2	12.4	8.7	5.7	15.1	10.5	6.5
>0.2 - ≤0.3	9.5	7.0	4.8	12.0	8.8	5.6
>0.3 - ≤0.4	6.8	5.4	3.8	8.5	7.0	4.5
>0.4	4.6	3.8	2.8	6.0	5.1	3.7
Overall	12.9	8.0	4.9	15.6	9.5	5.7

Orkaby et al. J Gerontol A Biol Sci Med Sci 2019.

Leveraging rich VA EHR data to identify patients who are frail: How do other automated tools compare?

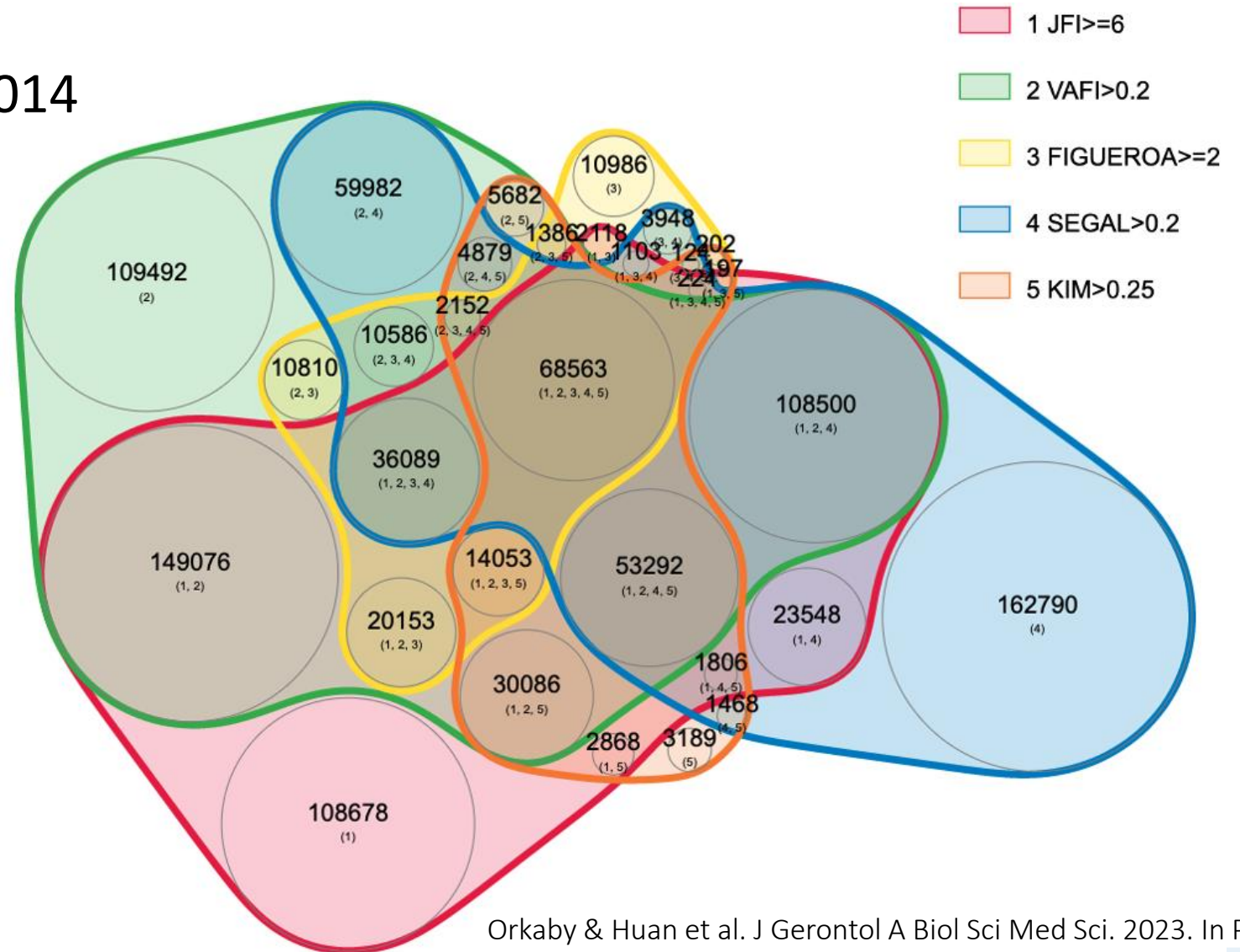
		Claims-Based FIs			Claims-Based FIs + Demographics, Utilization	
Domains		JEN FI	VA FI	Figueroa	Segal (Fried)	Kim (Medicare)
Diagnoses	Morbidity	X	X		X	X
	Function/mobility	X	X	X	X	X
	Cognition	X	X	X	X	X
	Mood	X	X		X	X
	Sensory	X	X			X
	Nutrition	X	X	X		X
	Geriatric syndromes	X	X		X	X
	Infectious disease	X			X	X
Utilization	Hospitalizations				X	X
	Nursing home use					X
Demographics	Age/Sex				X	

Orkaby & Huan et al. J Gerontol A Biol Sci Med Sci. 2023. In Press.

Different constructs of frailty will identify different people

2.6 Million Veterans seen in 2014

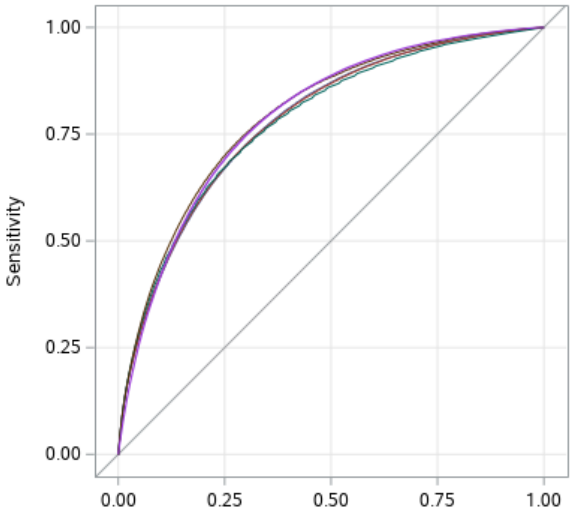
- Mean age 75, 98% male
- 80% White, 9% Black
- 7 – 26% frail
- Only ~3% frail by all CFIs



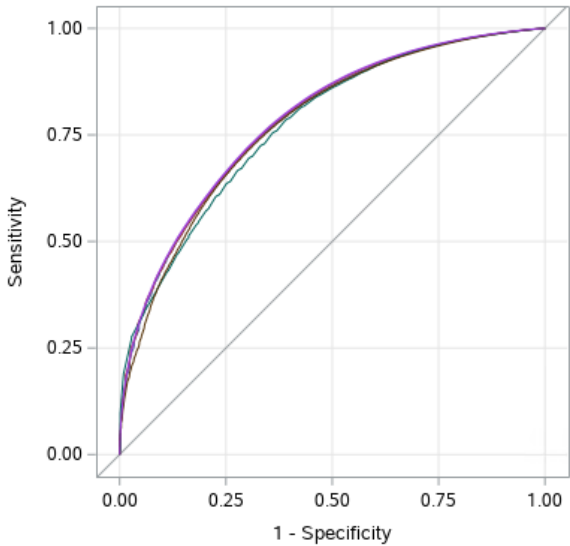
Orkaby & Huan et al. J Gerontol A Biol Sci Med Sci. 2023. In Press.

Yet, all similarly predicted risk of Long-term Institutionalization and Death

LTI



Death



Area Under the Curve (AUC)	JFI	VAFI	Figueroa	Segal	Kim
AUC – for LTI					
Frailty	0.69	0.71	0.66		
Frailty + age + sex	0.77	0.77	0.77		
Frailty + utilization	0.71	0.72	0.69		
Frailty +age + sex + utilization	0.78	0.78	0.78	0.80	0.79
AUC – for Death					
Frailty	0.67	0.70	0.60		
Frailty + age + sex	0.78	0.78	0.77		
Frailty + utilization	0.68	0.70	0.63		
Frailty +age + sex + utilization	0.78	0.78	0.77	0.78	0.79

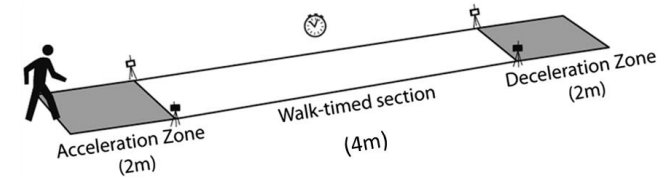
Selecting a frailty tool in clinic

Rapid Tools (<1-2 min)

- FRAIL scale
- Gait speed
- Chair Stands
- Risk Assessment Index (RAI)

Medium length Tools (2-5 min)

- Clinical Frailty Scale
- Short Physical Performance Battery
- Essential Frailty Toolset



Time Intensive

- Comprehensive Geriatric Assessment – Frailty Index
- Cognitive testing

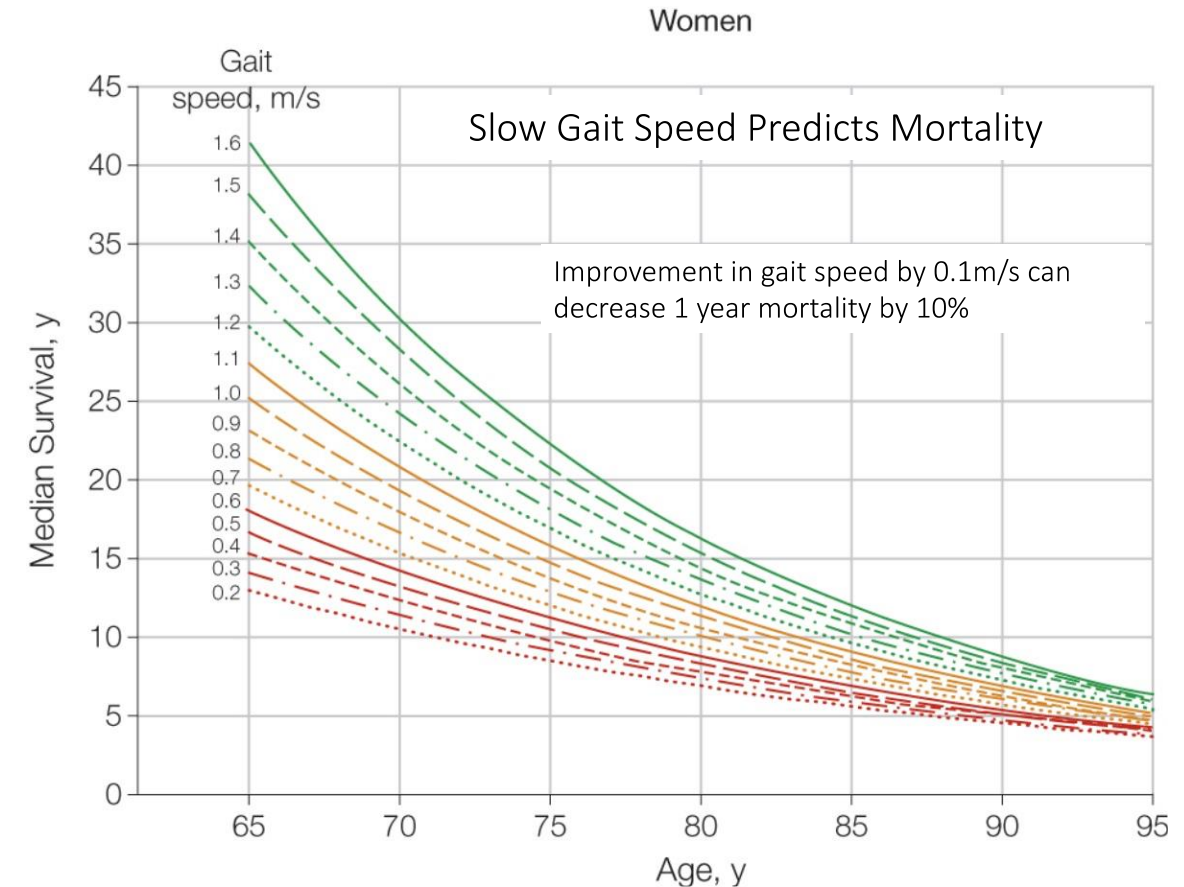
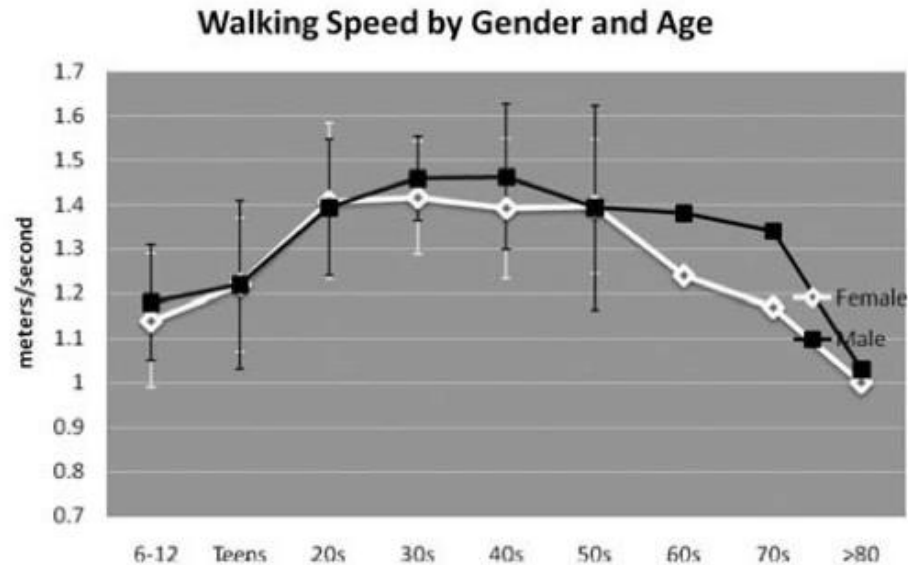
Passive Tools

- EHR/claims based FIs

Gait speed: a single marker of frailty and excellent integrator of overall health

White Paper: "Walking Speed: the Sixth Vital Sign"

Stacy Fritz, PT, PhD;¹ Michelle Lusardi, PT, PhD²



Fritz & Lusardi. J Geriatr Phys Ther. 2009.
Studenski et al JAMA 2011.

VIDEOS IN CLINICAL MEDICINE
SUMMARY POINTS

Julie R. Ingelfinger, M.D., *Editor*

Mobility Assessment in Older Adults

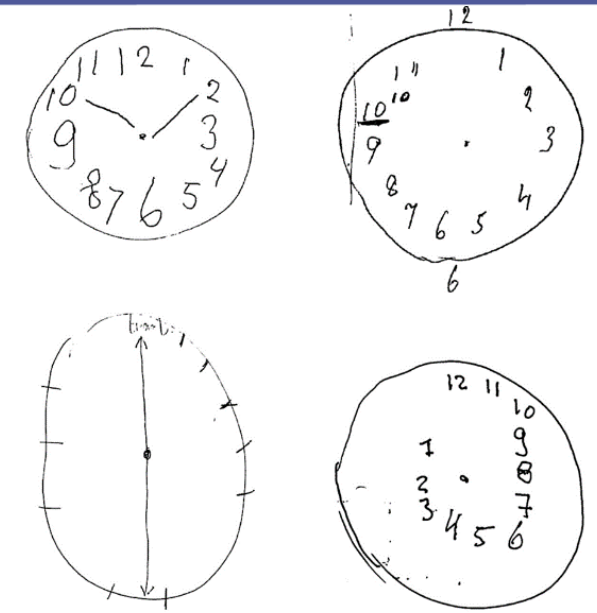
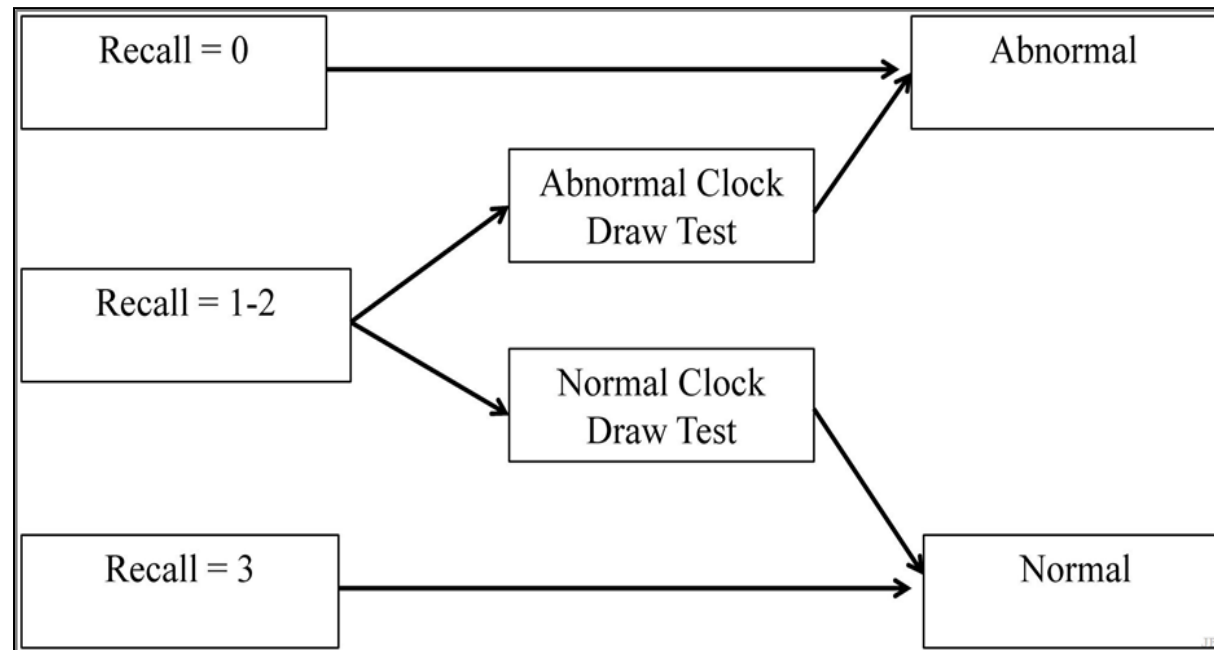
Kirstyn James, M.D., Andrea Wershof Schwartz, M.D., M.P.H.,
and Ariela R. Orkaby, M.D., M.P.H.



What about the brain?

Screen using the MiniCog

- 3-word recall: banana, sunrise, chair
- Clock draw: “Ten past Eleven”



Heng, M, et al JBS 2016.

Borson S. Int J Geriatr Psychiatry 2000.

Cognitive impairment (frailty): marker of risk or reason to intervene?

It may depend on the intervention!

Meta-analysis of 18 studies after TAVR:

1,065 patients, (49% male, average age ≥ 80)

Findings: improvement at 1 month

Overall preserved cognition

... driven by patient selection?

... short term delirium risk?

~2900 patients with dementia:

- increased delirium, transfusion, longer stay, discharge to facility

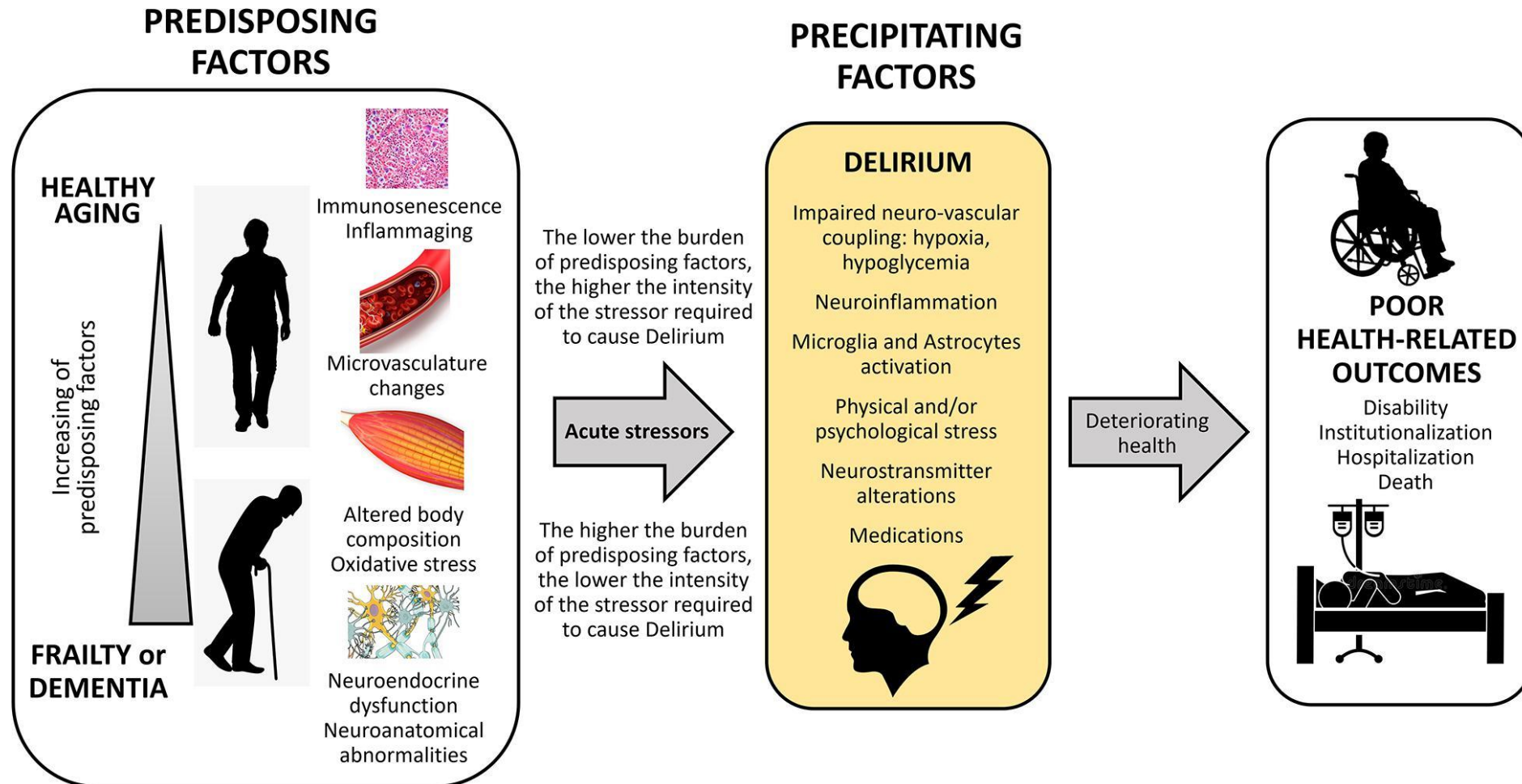
Our patient: MOCA 17/30

- Executive dysfunction
- Impaired Recall
- Other: attention, language

Khan MM et al. JAGS 2018.

Jain V et al. JAGS 2021.

Frailty, Cognitive Impairment and Risk of Delirium



Bellelli et al. Front Aging Neurosci. 2021.

Comprehensive Geriatric Assessment - Frailty Index

1. Medical History*
2. Functional Status*
3. Performance Tests
 - Cognition
 - Chair stands
 - Gait speed
 - Grip Strength
4. Nutritional Status
 - Weight loss
 - BMI
 - Albumin

CGA-FI

Items marked with a star () must be completely assessed.

Medical History * (21 items)
RESET

Check any items that the patient has in his/her medical history.

<input checked="" type="checkbox"/> Angina	<input checked="" type="checkbox"/> COPD	<input checked="" type="checkbox"/> Heart failure
<input checked="" type="checkbox"/> Anxiety disorder	<input checked="" type="checkbox"/> Coronary artery disease	<input checked="" type="checkbox"/> Hypertension
<input checked="" type="checkbox"/> Arthritis	<input checked="" type="checkbox"/> Degenerative spine disease	<input checked="" type="checkbox"/> Myocardial infarction
<input checked="" type="checkbox"/> Asthma	<input checked="" type="checkbox"/> Dementia	<input checked="" type="checkbox"/> Peripheral vascular disease
<input checked="" type="checkbox"/> Atrial fibrillation/flutter	<input checked="" type="checkbox"/> Depression	<input checked="" type="checkbox"/> Sensory impairment
<input checked="" type="checkbox"/> Cancer within 5 years	<input checked="" type="checkbox"/> Diabetes	<input checked="" type="checkbox"/> Stroke/TIA
<input checked="" type="checkbox"/> Chronic kidney disease (eGFR < 60)	<input checked="" type="checkbox"/> Fall within the past year	<input checked="" type="checkbox"/> Use of ≥ 5 prescription drugs


Functional Status * (22 items)
RESET

Does the patient need help from another person to perform the following activities?

Activities of Daily Living	Instrumental Activities of Daily Living	Nagi & Rosow-Breslau Activities
<input checked="" type="checkbox"/> Feeding	<input checked="" type="checkbox"/> Using telephone	<input checked="" type="checkbox"/> Pulling or pushing a large object
<input checked="" type="checkbox"/> Dressing/undressing	<input checked="" type="checkbox"/> Using transportation	<input checked="" type="checkbox"/> Stooping, crouching or kneeling
<input checked="" type="checkbox"/> Grooming	<input checked="" type="checkbox"/> Shopping	<input checked="" type="checkbox"/> Lifting or carrying 10 lbs
<input checked="" type="checkbox"/> Walking (or use of a walker)	<input checked="" type="checkbox"/> Preparing own meals	<input checked="" type="checkbox"/> Reaching arms above shoulder
<input checked="" type="checkbox"/> Getting in and out of bed	<input checked="" type="checkbox"/> Housework	<input checked="" type="checkbox"/> Writing or handling small objects
<input checked="" type="checkbox"/> Toileting	<input checked="" type="checkbox"/> Taking own medications	<input checked="" type="checkbox"/> Walking up/down a flight of stairs
<input checked="" type="checkbox"/> Bathing or shower	<input checked="" type="checkbox"/> Managing money	<input checked="" type="checkbox"/> Walking half a mile
		<input checked="" type="checkbox"/> Heavy work around house


Performance Tests (4 items)
RESET

Mental State Examination MMSE MoCA Mini-Cog




Points (MMSE)

5 Repeated Chair Stands



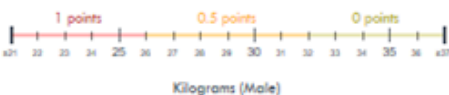
Seconds

Gait Speed



Meters/Second

Dominant Handgrip Strength



Kilograms (Male)

Nutritional Status (3 items)
RESET

Weight loss > 10lbs in past year	<input checked="" type="checkbox"/>	Body mass index < 21kg/m ²	<input checked="" type="checkbox"/>	Serum albumin < 3.5 g/L	<input checked="" type="checkbox"/>
----------------------------------	-------------------------------------	---------------------------------------	-------------------------------------	-------------------------	-------------------------------------



Medical History* (7/21 items)

RESET

Check any items that the patient has in his/her medical history.

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Angina | <input checked="" type="checkbox"/> COPD | <input checked="" type="checkbox"/> Heart failure |
| <input checked="" type="checkbox"/> Anxiety disorder | <input checked="" type="checkbox"/> Coronary artery disease | <input checked="" type="checkbox"/> Hypertension |
| <input checked="" type="checkbox"/> Arthritis | <input checked="" type="checkbox"/> Degenerative spine disease | <input checked="" type="checkbox"/> Myocardial infarction |
| <input checked="" type="checkbox"/> Asthma | <input checked="" type="checkbox"/> Dementia | <input checked="" type="checkbox"/> Peripheral vascular disease |
| <input checked="" type="checkbox"/> Atrial fibrillation/flutter | <input checked="" type="checkbox"/> Depression | <input checked="" type="checkbox"/> Sensory impairment |
| <input checked="" type="checkbox"/> Cancer within 5 years | <input checked="" type="checkbox"/> Diabetes | <input checked="" type="checkbox"/> Stroke/TIA |
| <input checked="" type="checkbox"/> Chronic kidney disease (eGFR<60) | <input checked="" type="checkbox"/> Fall within the past year | <input checked="" type="checkbox"/> Use of >= 5 prescription drugs |

Functional Status* (4/22 items)

RESET

Does the patient need help from another person to perform the following activities?

Activities of Daily Living

- ☒ Feeding
- ☒ Dressing/undressing
- ☒ Grooming
- ☒ Walking (or use of a walker)
- ☒ Getting in and out of bed
- ☒ Toileting
- ☒ Bathing or shower

Instrumental Activities of Daily Living

- ☒ Using telephone
- ☒ Using transportation
- ☒ Shopping
- ☒ Preparing own meals
- ☒ Housework
- ☒ Taking own medications
- ☒ Managing money

Nagi & Rosow-Breslau Activities

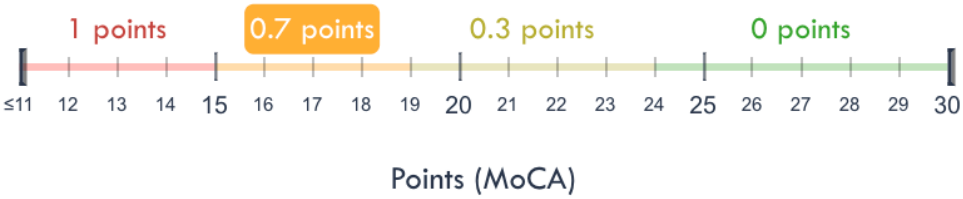
- ☒ Pulling or pushing a large object
- ☒ Stooping, crouching or kneeling
- ☒ Lifting or carrying 10 lbs
- ☒ Reaching arms above shoulder
- ☒ Writing or handling small objects
- ☒ Walking up/dn a flight of stairs
- ☒ Walking half a mile
- ☒ Heavy work around house

Performance Tests (1.9/4 items)

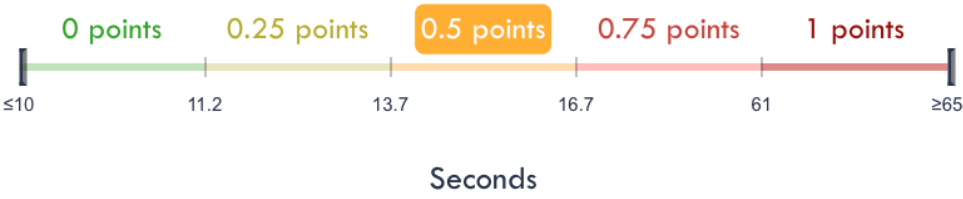
RESET

Mental State Examination

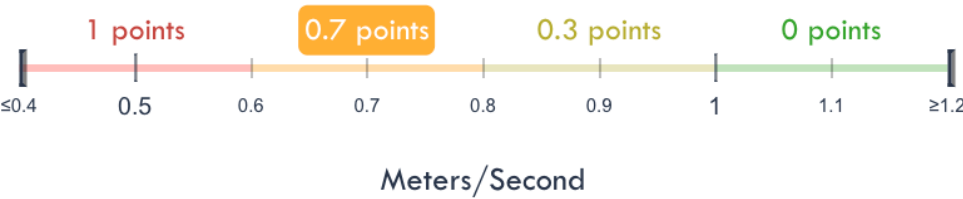
- MMSE
- MoCA
- Mini-Cog



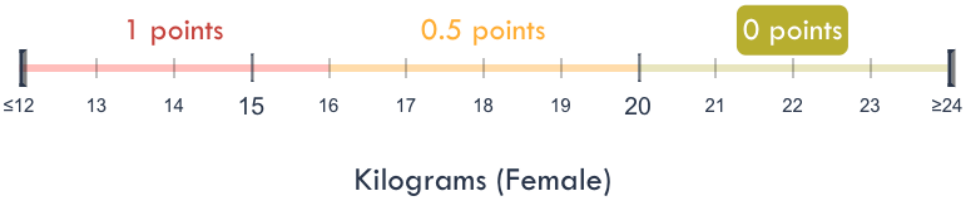
5 Repeated Chair Stands



Gait Speed



Dominant Handgrip Strength



Nutritional Status (1/3 items)

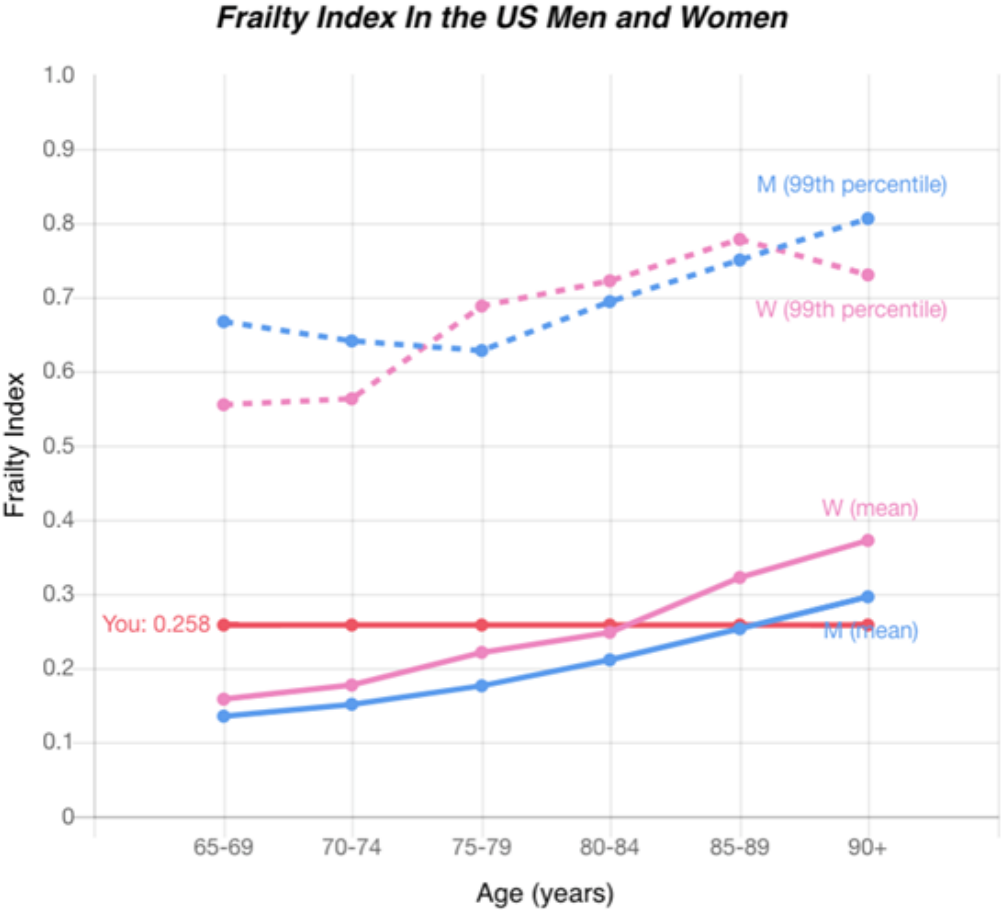
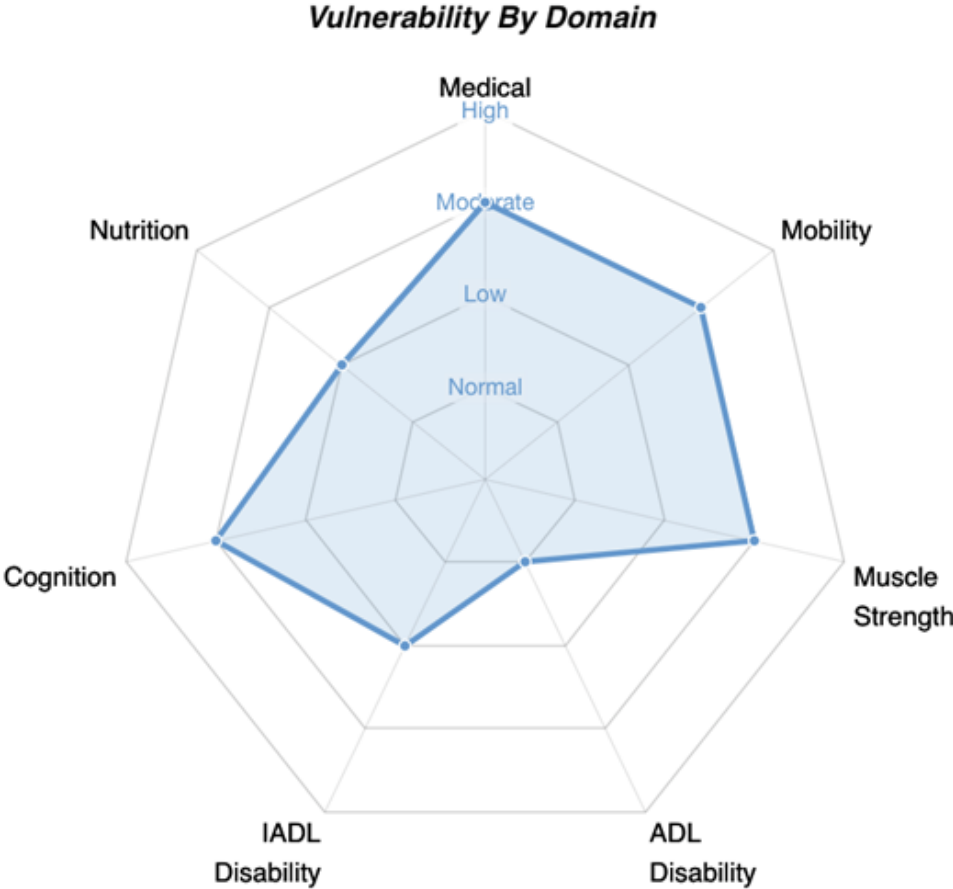
RESET

- Weight loss > 10lbs in past year ☒
- Body mass index < 21kg/m² ☒
- Serum albumin < 3.5 g/L ☒

Number of positive items: 12.9 Number of items assessed: 50 CGA-FI (range: 0.0-1.0): 0.258

YOUR HEALTH DASHBOARD

YOUR FRAILTY INDEX : 0.258 (MILD FRAILTY)



Developed by Dr. Dae Kim:

<https://www.bidmc.org/research/research-by-department/medicine/gerontology/calculator>

The “age-frailty continuum”: frailty is dynamic

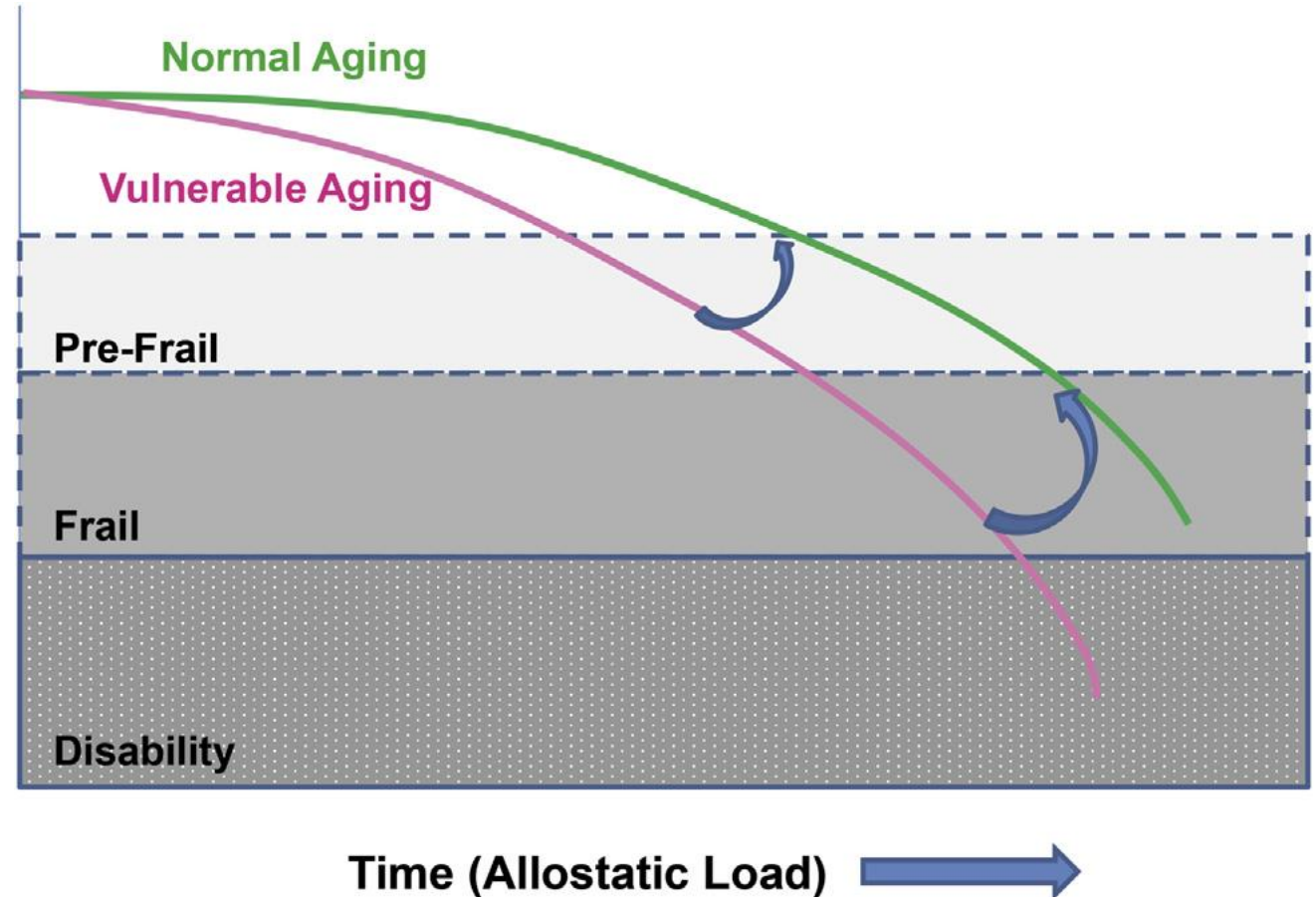
Frailty is not:

- a disease state
- a reason to withhold care

Frailty is an opportunity to:

- personalize care plans
- minimize risk

“Precision Gerontology”



Abellan van Kan et al. J Nutr Health Aging 2008.
Ferucci and Kuchel JAGS 2021.

Mrs. R: 86F with severe Aortic Stenosis and Mild Frailty

Greatest operative risk: delirium and loss of function



The Geriatric 5Ms approach to mitigate risk:

 **Mobility**

✓ Pre-habilitation

 **Mind**

✓ Delirium Prevention

 **Medications**

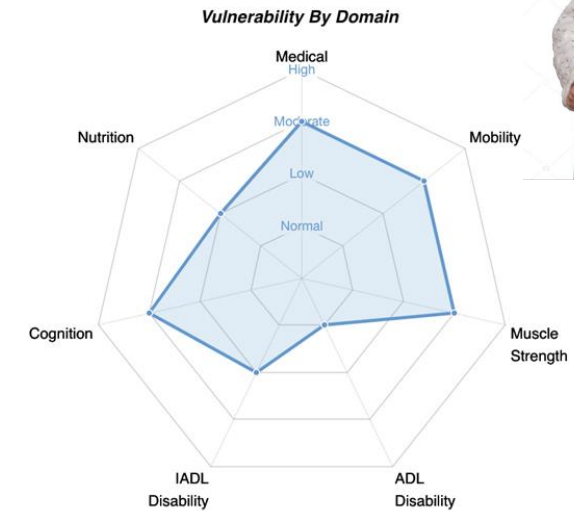
✓ Appropriate Prescribing

 **Multicomplexity**

✓ Optimize nutrition, chronic conditions

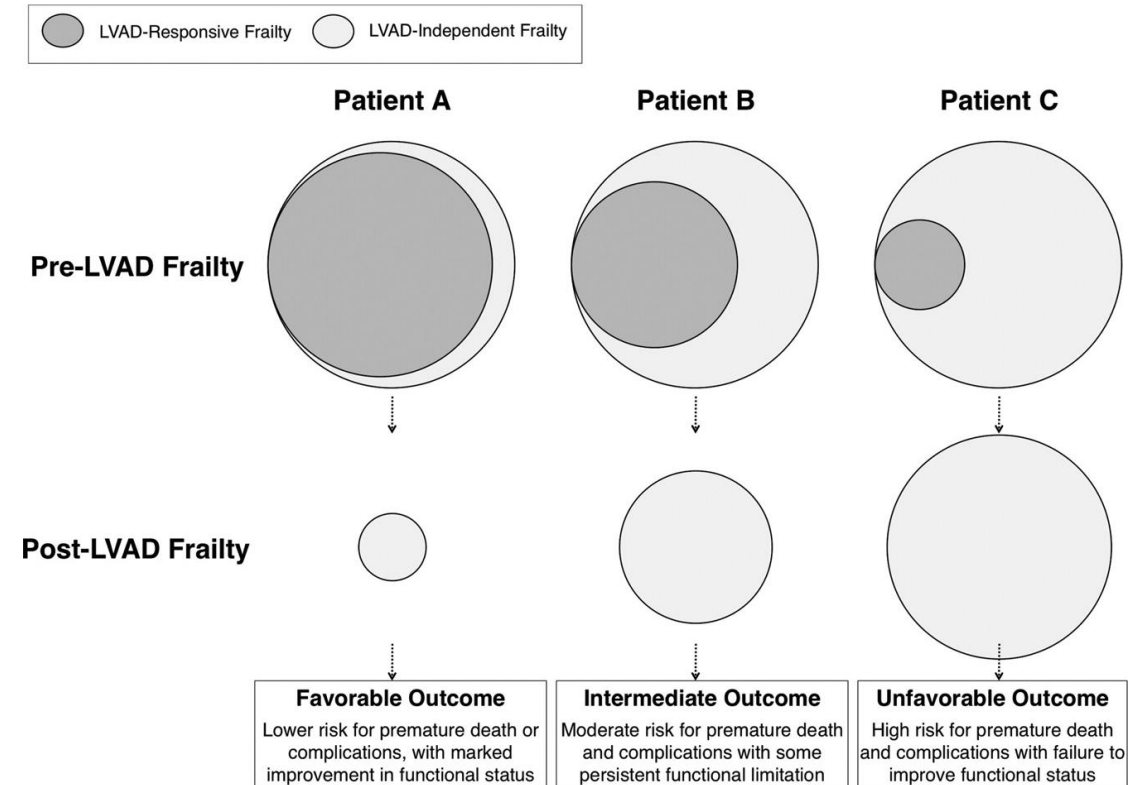
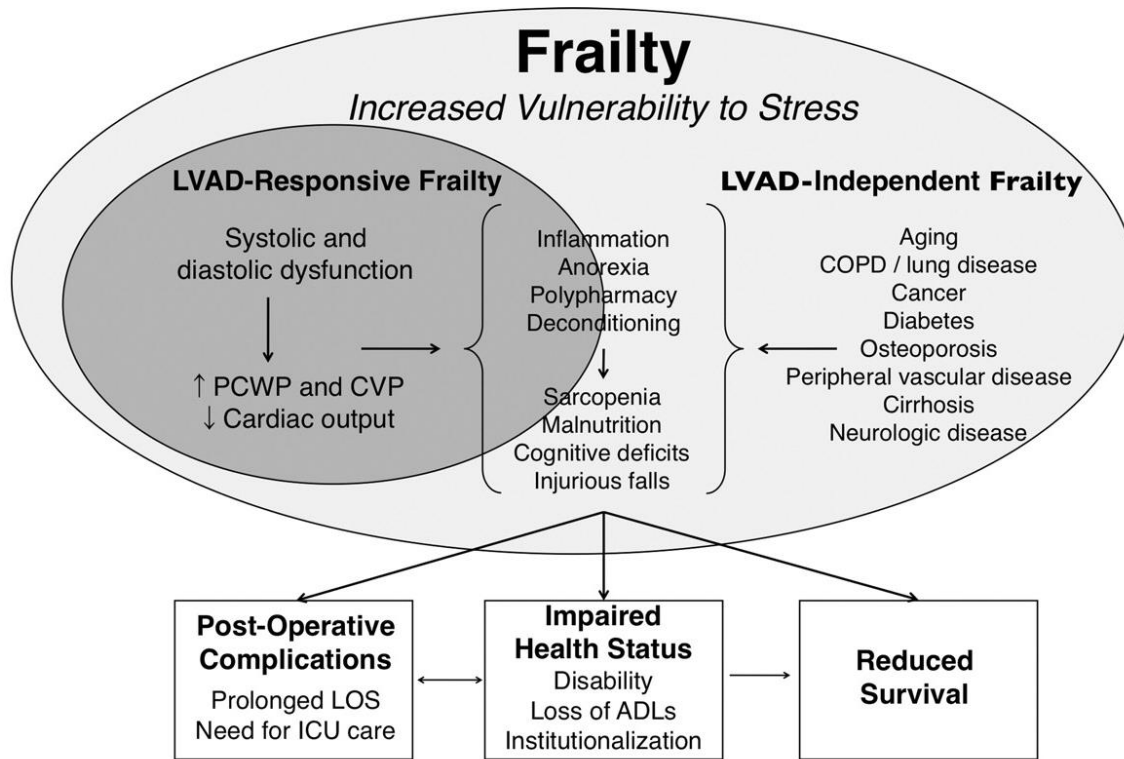
 **Matters Most**

✓ Goals of Care



Tinetti M et al. JAGS 2017.
Schwartz AW. Fed Pract 2023.

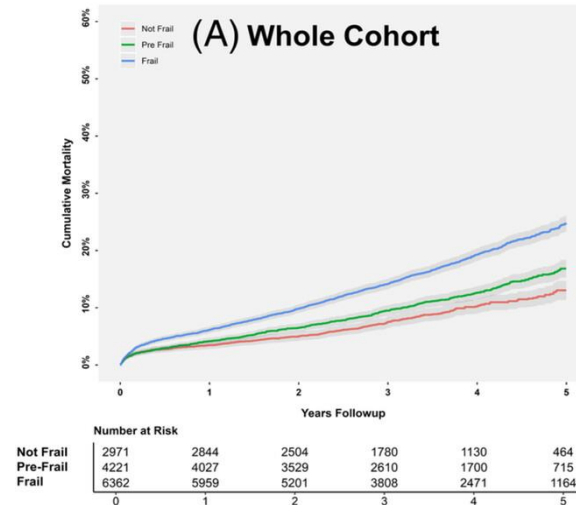
Frailty in the presence of a dominant disease: what is driving health status? The dominant disease or frailty?



Flint et al Circ: Heart Failure 2012.

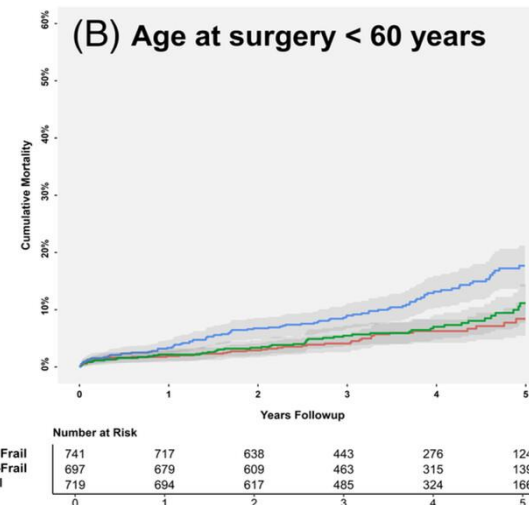
At what age should we begin assessing frailty?

Frailty is relevant even in Veterans <60 undergoing cardiac surgery



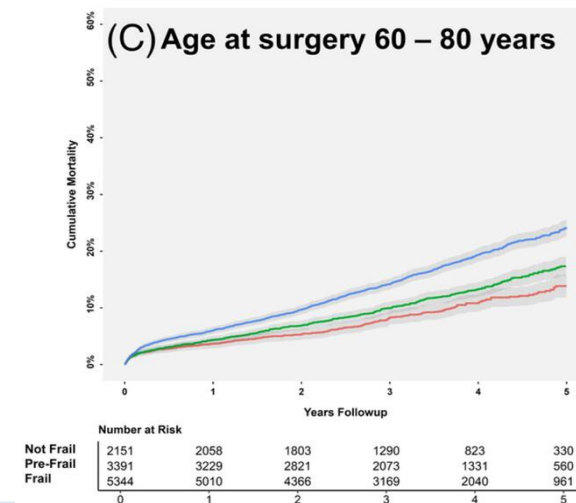
Group	5-year Cumulative Mortality (%)
Frail	24.75 (23.33, 26.13)
Pre-Frail	16.83 (15.28, 18.30)
Not Frail	13.04 (11.36, 14.68)

Comparison	Log-rank p-value
Pre-Frail vs Not Frail	0.001
Frail vs Not Frail	< 0.001
Frail vs Pre-Frail	< 0.001



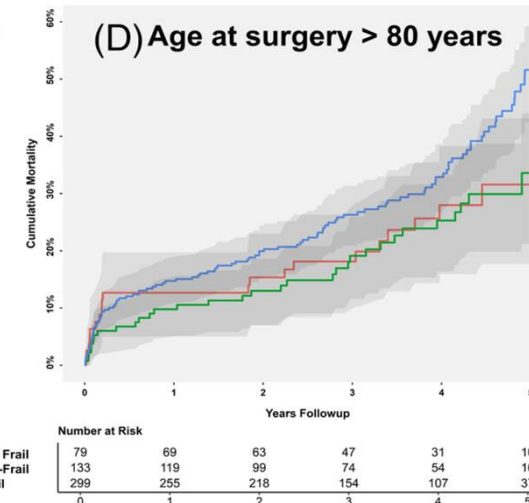
Group	5-year Cumulative Mortality (%)
Frail	17.8 (14.00, 21.21)
Pre-Frail	11.14 (7.69, 14.46)
Not Frail	8.40 (5.46, 11.26)

Comparison	Log-rank p-value
Pre-Frail vs Not Frail	0.70
Frail vs Not Frail	< 0.001
Frail vs Pre-Frail	< 0.001



Group	5-year Cumulative Mortality (%)
Frail	24.16 (22.64, 25.64)
Pre-Frail	17.33 (15.59, 19.02)
Not Frail	13.84 (11.82, 15.18)

Comparison	Log-rank p-value
Pre-Frail vs Not Frail	0.01
Frail vs Not Frail	< 0.001
Frail vs Pre-Frail	< 0.001

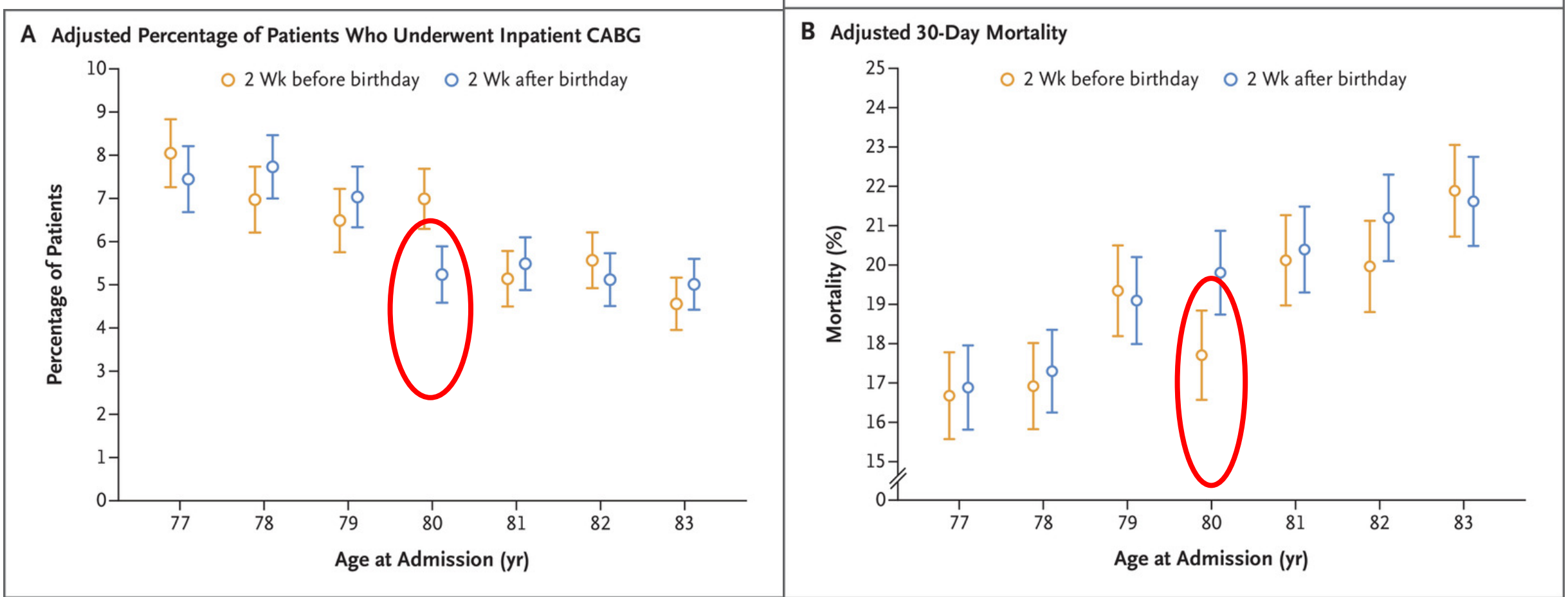


Group	5-year Cumulative Mortality (%)
Frail	51.59 (42.50, 59.24)
Pre-Frail	33.58 (21.22, 44.01)
Not Frail	31.57 (17.71, 43.09)

Comparison	Log-rank p-value
Pre-Frail vs Not Frail	0.99
Frail vs Not Frail	0.09
Frail vs Pre-Frail	0.59

Kochar & Deo ... Orkaby. JAGS 2023.

Beware of behavioral heuristics: left-digit bias in clinical decision-making - the CABG example



Olenski et al NEJM 2020.

Is “frailism”
the new
“ageism”?



Integration of Frailty into Decision Making: the Geriatrician's Perspective

Ariela R. Orkaby, MD, MPH

Geriatrics & Preventive Cardiology

New England GRECC, VA Boston Healthcare System

Brigham & Women's Hospital

Assistant Professor of Medicine, Harvard Medical School





Surgical Pause Symposium

Tracking Process and Outcome Measures
Daniel E. Hall



Why track Process and Outcome Measures?

Data are Powerful



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



Types of Measures: Process Measures

- Process Measures quantify steps necessary to deliver the intervention
 - Surgical Pause: (1) Measure Frailty; (2) Do Something About it
 - Step 1: Measure Frailty in a defined target population (N)
 - N(%) with valid RAI
 - N(%) with $RAI \geq 37$
 - Step 2: Do Something About It
 - N(%) with [INTERVENTION] Ordered
 - N(%) with [INTERVENTION] Completed
 - N(%) with [INTERVENTION] Fidelity/Quality



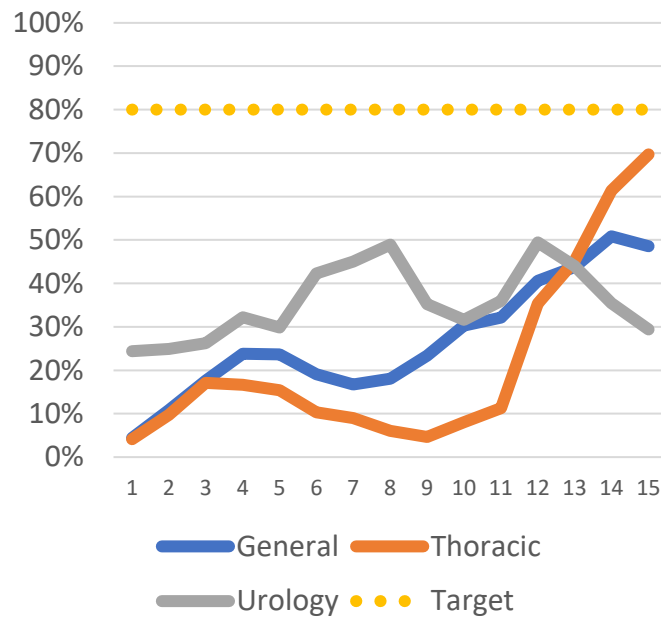
VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium

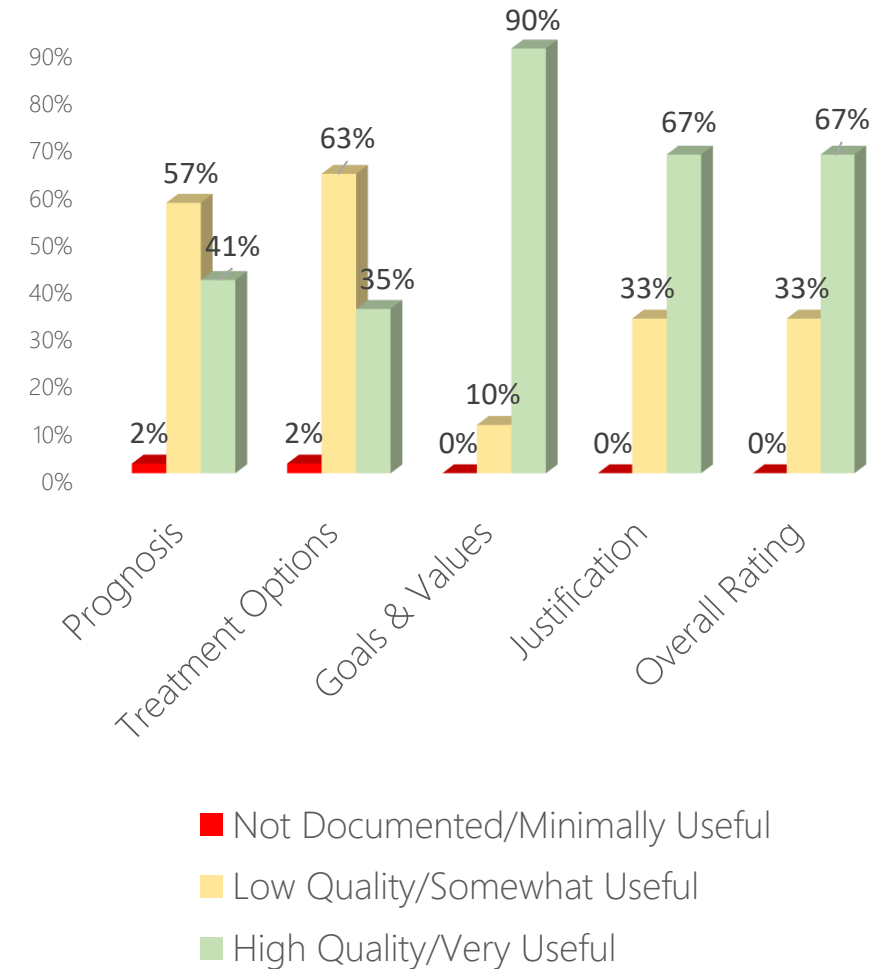
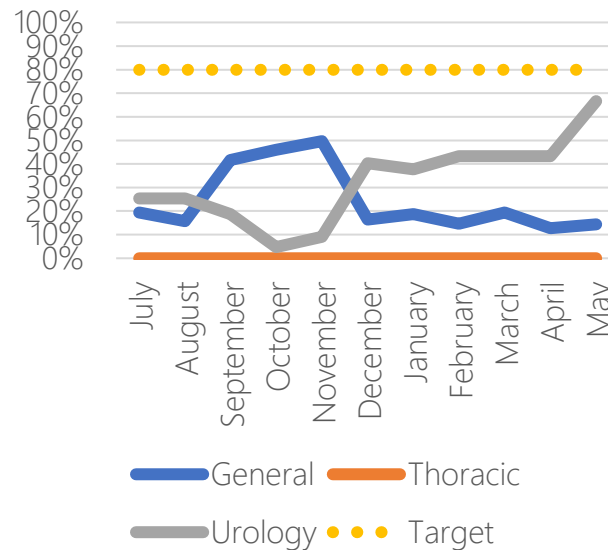


Process Measures: Audit and Feedback

% Visits with RAI Assessment
Rolling 3-Month Average



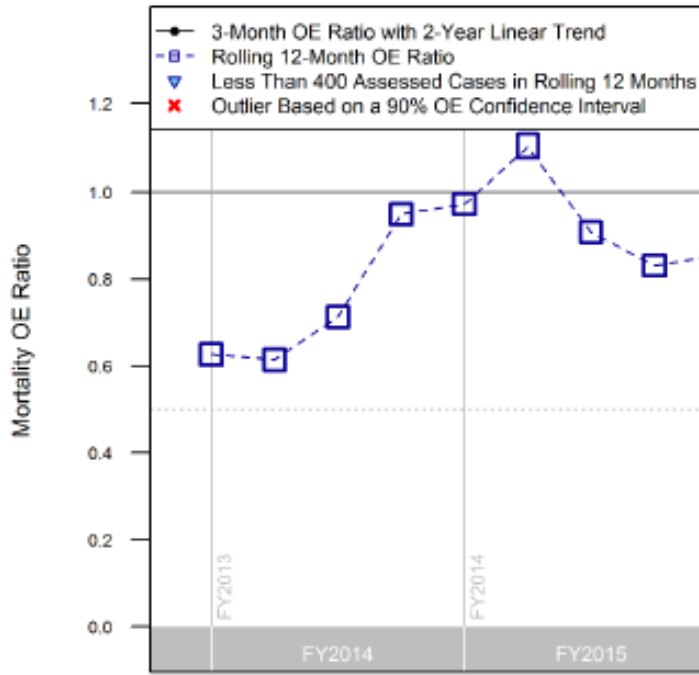
% RAI \geq 37 with Goals of Care Consult
Rolling 3-month Average



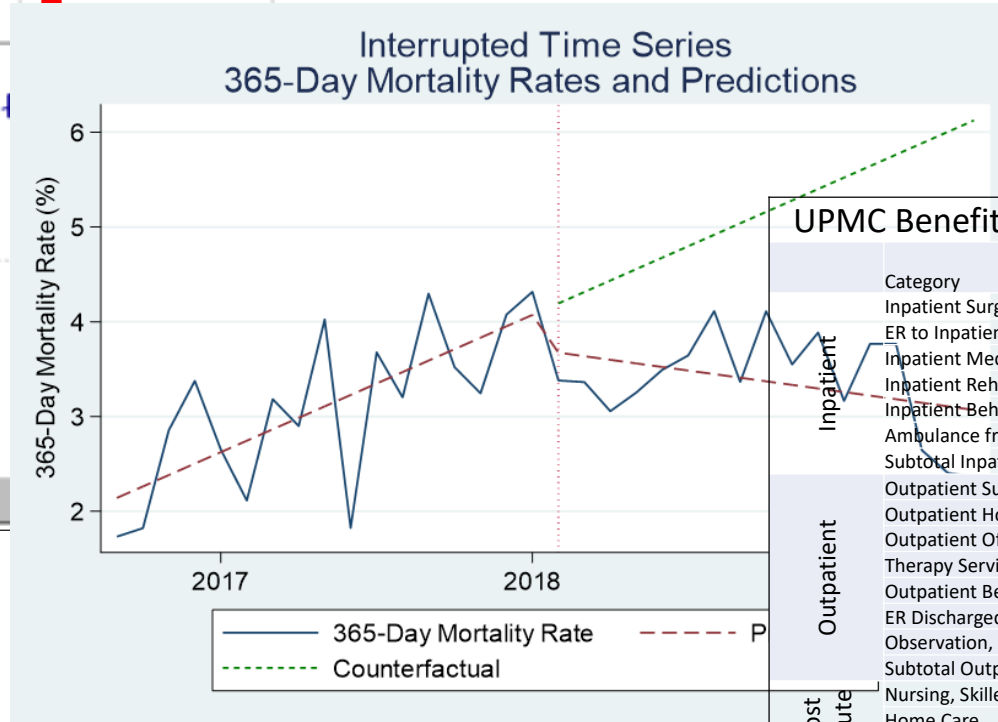
Types of Measures: Outcome Measures

- Outcome Measures quantify health or experience of patient
 - Postoperative Mortality
 - Postoperative Complications
 - ICU Admission and/or Length of Stay
 - Hospital Length of Stay
 - Cost
- Surrogate/Intermediate Outcomes
 - Change in 6 minute walk test, grip strength or Timed up and Go
 - Change in respiratory muscle pressures
 - Change in HgbA1c, BMI, etc
- Patient Reported Outcome Measures
 - Bereaved Family Survey (Quality of end of life care)
 - Patient Centeredness of Care & Satisfaction
 - Decision Regret
 - Human Flourishing Index

Outcome Measures



Frailty Screening Initiative begins 12/15/15



UPMC Benefit Amounts normalized to 'Normal 30-36' total charges

Category	Robust ≤29	Normal 30 to 36	Frail 37 to 44	Very frail ≥45
Inpatient				
Inpatient Surgical DRG	0.34	0.34	0.35	0.34
ER to Inpatient Surgical DRG	0.03	0.05	0.07	0.08
Inpatient Medical DRG, General, Specialist and Observation	0.06	0.11	0.14	0.19
Inpatient Rehabilitation	0.00	0.00	0.01	0.01
Inpatient Behavioral Health	0.00	0.00	0.00	0.00
Ambulance from Facility to Facility	0.00	0.00	0.00	0.00
Subtotal Inpatient Charges	0.43	0.51	0.57	0.62
Outpatient				
Outpatient Surgery	0.04	0.07	0.05	0.06
Outpatient Hospital and Specialized Facility	0.09	0.28	0.21	0.24
Outpatient Office, PCP and Other	0.01	0.02	0.02	0.03
Therapy Service (Is this like Outpatient Rehab/PT?)	0.01	0.00	0.00	0.00
Outpatient Behavioral Health	0.00	0.00	0.00	0.00
ER Discharged to Home	0.01	0.01	0.01	0.01
Observation, from ER or Office	0.01	0.01	0.01	0.01
Subtotal Outpatient Charges	0.17	0.39	0.32	0.36
Post Acute				
Nursing, Skilled and General	0.01	0.02	0.05	0.07
Home Care	0.03	0.05	0.06	0.07
Subtotal Post Acute Charges	0.04	0.08	0.11	0.14
Other				
Other (e.g., Lab, OB/GYN, Maternity, Urgent Care)	0.00	0.01	0.01	0.00
Shock Claims	0.04	0.01	0.05	0.04
Subtotal Other Charges	0.04	0.02	0.05	0.04
Total Charge	0.69	1.00	1.05	1.17

Outcome Measures

Baseline to Day of Surgery

Significant Changes in Physical Performance

Measure	Baseline Mean (SD)	Day of Surgery Mean (SD)	Mean Difference (Standard Error)	P value	Minimum Clinically Important Difference
Extended TUG (seconds)	N=42 21.9 (12.5)	N=33 17.8 (4.6)	-2.3 (0.5)	<0.001	2.4s
Gait Speed (meters/second)	N=42 1.11 (0.32)	N=33 1.24 (0.30)	+0.1 (0.03)	0.002	0.1m/s
5 Chair Rise (seconds)	N=38 13.3 (5.7)	N=33 11.8 (4.6)	-1.6 (0.6)	0.007	2.3s
Six Minute Walk Test (meters)	N=40 348.6 (109.1)	N=30 380.6 (102.2)	+29.3 (15.6)	0.060	30m
SPPB Score	N=41 10.2 (1.9)	N=33 10.8 (1.1)	+0.6 (0.3)	0.068	1 unit

Table 4. Quality of Life and Surgical Care, Decision Regret, Preference for Operative Management, Patient Centeredness of Care.

Outcome		Baseline	Day of Surgery	30-Day	90-Day	Δ Baseline to Surgery	Δ Baseline to 90-Day	Δ Surgery to 90-Day	Overall Difference across time
		N Mean SD	N Mean SD	N Mean SD	N Mean SD	Mean Δ SE P-Value	Mean Δ SE P-Value	Mean Δ SE P-Value	P-Value
Quality of Life (Utility)		41 0.78 0.16	35 0.8 0.13	--	32 0.8 0.17	0.02 0.02 0.302	0.002 0.02 0.927	-0.003 0.02 0.908	0.673
Quality of Surgical Care			34 1.2 0.3	30 1.2 0.4					0.893
Patient Centeredness of Care			35 1.4 0.5	--	32 1.3 0.3			-0.1 0.1 0.049	
Satisfaction with Multi-disciplinary Preoperative Clinic		27 4.6 0.5	35 4.3 0.7	--	32 4.4 0.8	-0.1 0.1 0.331	-0.2 0.2 0.314	0.1 0.1 0.720	0.520
Preference for Operative Management			35 4.5 0.8	33 4.7 0.5	32 4.6 0.8			0.1 0.2 0.562	0.407
Decision Regret			35 9.3 13.8	33 8.0 14.6	32 8.6 14.2			-1.1 2.5 0.677	0.839

Hall DE, et al. Preoperative Rehabilitation Is Feasible in the Weeks Prior to Surgery and Significantly Improves Functional Performance. *Journal of Frailty & Aging*. 2022;10.14283/jfa.2022.42

REDCap

Quality of Life

Satisfaction With CPC

Decision Regret

Preference for Operative

Patient-Centeredness

Satisfaction with Decision

Flourishing

   Matrix group: regret

Please reflect on your decision about whether or not to have [specific] surgery. Please show how strongly you agree or disagree with the following statements by checking the number from "strongly agree" to "strongly disagree" that best fits your views about your decision.

  Variable: regret1

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
It was the right decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

reset

  Variable: regret2

I regret the choice that was made.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
------------------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

reset

  Variable: regret3

I would go for the same choice if I had to do it over again.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

reset

  Variable: regret4

The choice did me a lot of harm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
----------------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

reset

  Variable: regret5

The decision was a wise one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
------------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

reset



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



Human Flourishing

12 Item scale; internationally validated

- Physical and Mental Health
- Happiness and Life Satisfaction
- Close Social Relationships
- Meaning and Purpose
- Character and Virtue
- Financial and Material Stability

VanderWeele TJ. *Proc Natl Acad Sci* 2017;114(31):8148-8156.

	Domain 1 (Happiness and Life Satisfaction)		Domain 2 (Mental and Physical Health)		Domain 3 (Meaning and Purpose)	
	Coefficient (95% CI)	p value ^a	Coefficient (95% CI)	P value ^a	Coefficient (95% CI)	p value ^a
Depression (PHQ8)	-0.28 (-0.34, -0.23)	<0.001	-0.31 (-0.37, -0.26)	<0.001	-0.20 (-0.26, -0.14)	<0.001
Anxiety (GAD7)	-0.24 (-0.31, -0.19)	<0.001	-0.26 (-0.32, -0.21)	<0.001	-0.17 (-0.23, -0.11)	<0.001
Swallowing (EAT10)	-0.085 (-0.12, -0.05)	<0.001	-0.11 (-0.14, -0.07)	<0.001	-0.050 (-0.08, -0.02)	0.00135
Neck Disability (NDI)	-0.14 (-0.17, -0.1)	<0.001	-0.15 (-0.19, -0.11)	<0.001	-0.080 (-0.12, -0.04)	<0.001
Insomnia (ISI)	-0.16 (-0.21, -0.11)	<0.001	-0.16 (-0.22, -0.12)	<0.001	-0.085 (-0.14, -0.03)	<0.001
	Domain 4 (Character and Virtue)		Domain 5 (Close Social Relationships)		Domain 6 (Financial and Material Stability)	
	Coefficient (95% CI)	p value ^a	Coefficient (95% CI)	p value ^a	Coefficient (95% CI)	p value ^a
Depression (PHQ8)	-0.090 (-0.15, -0.03)	0.00372	-0.19 (-0.25, -0.12)	<0.001	-0.26 (-0.34, -0.18)	<0.001
Anxiety (GAD7)	-0.065 (-0.12, -0.01)	0.0325	-0.15 (-0.21, -0.08)	<0.001	-0.23 (-0.31, -0.15)	<0.001
Swallowing (EAT10)	-0.033 (-0.06, -0.01)	0.0177	-0.035 (-0.07, 0.00)	0.0266	-0.075 (-0.12, -0.04)	<0.001
Neck Disability (NDI)	-0.033 (-0.07, 0.00)	0.0692	-0.075 (-0.12, -0.04)	<0.001	-0.13 (-0.18, -0.08)	<0.001
Insomnia (ISI)	-0.036 (-0.08, 0.01)	0.124	-0.10 (-0.15, -0.05)	<0.001	-0.14 (-0.21, -0.07)	<0.001

Harris A, *Cancer Med.* Mar 11 2022;10.1002/cam4.4636

How did we track Process and Outcome Measures?

Health Factors



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



Step 1: Measure Frailty

Finding the RAI note in CPRS

OPTION 1

Progress Note Properties

Progress Note Title: RAI <RAI FRAILTY TOOL>

RAI <RAI FRAILTY TOOL>

RAPID <RAPID RESPONSE NOTE>

RAPID RESPONSE NOTE

RATING <DEFENSE AND VETERANS PAIN RATING SCORE>

RCAT <RCAT-TELERCAT MOBILE>

RCAT-TELERCAT MOBILE

REACH <REACH VET COORDINATOR NOTE>

REACH <REACH VET PROVIDER NOTE>

REACH VET COORDINATOR NOTE

REACH VET PROVIDER NOTE

REACTION <ADVERSE REACTION/ALLERGY>

REACTION <TRANSFUSION REACTION-BLOOD BANK>

READER <TELEDERMATOLOGY READER CONSULT>

READER <TELEWOUND READER CONSULT>

READINGS <GLUCOSE MONITOR READINGS - PATIENT REPORTED>

READMISSION <IMPACT READMISSION PREVENTION CONSULT>

READMISSION <IMPACT SURGICAL READMISSION PREVENTION COMPLETION>

READMISSION <IMPACT SURGICAL READMISSION PREVENTION ENROLLMENT>

READMISSION <IMPACT SURGICAL READMISSION PREVENTION FOLLOW-UP>

REALITY <CLC VIRTUAL REALITY INTERVENTION NOTE>

OPTION 2

File Edit View Action Options Tools Help

ZZ TESTDUCK,DAISY (OUTPATIENT)
000-00-0840 Apr 08,1940 (82)

Last 250 Signed Notes (Total: 147)

New Note in Progress

Sep 07,22 RAI FRAILTY TOOL, TES

Signed notes by date range

Administrative Information

Adverse React/Allergy

/ Templates

SURGERY

BARIATRIC COMPLICATIONS

BARIATRIC INITIAL POST OP FOLLOW UP VISIT

BARIATRIC INTERMEDIATE POST OP FOLLOW L

BARIATRIC PATIENT SELF ASSESS

CoC Colon Resection

CoC Excision for Melanoma

Informed Consent (Surgery)

INFUSION STOPPED

LESION EXCISION OP REPORT

SURGICAL PAUSE NOT INDICATED

V4 PRE-OP RAI SCORE

V4 RAI FRAILTY SCORE

TELEHEALTH

TELEDERMATOLOGY READER CONSULT

TELEWOUND READER CONSULT

Reminders

Encounter

New Note

Cover Sheet Problems Meds Orders Notes Consult

Reminder Dialog Template: RAI FRAILTY TOOL

* Significant frailty is indicated by scores greater than or equal to 37

Use the Online RAI to calculate the RAI; then record the value in the field below.

RAI score is:
(Must be an integer value between 0 and 81)

*

☐ Select this checkbox if patient indicated history of cancer

The RAI is an assessment of frailty and coordination. It can be used

Patient Demographics

Age:

Social History

Does the patient live in a nursing home, facility or another assisted living environment?

Medical Conditions

Has the patient ever seen a nephrologist have a history of kidney problems?

Does the patient have chronic (long-term) failure (CHF)?

Does the patient currently have shortness of resting or with minimal activity?

Prompt: "Do you have trouble catching your breath with minimal activities? For example: walking to the mailbox?"

In the past 5 years, has the patient been treated for cancer?

Variable	Score
Sex:	3
Cancer Status:	Yes
Age*Cancer Status:	32
Weight Loss:	4
Poor Appetite:	4
Renal Insufficiency:	8
Chronic/Congestive Heart Failure:	5
Shortness of Breath:	3
Dependent Living:	1
Cognitive Decline:	Yes
ADL*Cognitive Decline:	8
Mobility:	Need
Eating:	Need
Toileting:	Need
Personal Hygiene:	Can't
RAI Score:	58
RAI Score (without Cancer):	52

Select this checkbox if patient indicated history of cancer

Paste scoring table from RAI calculator in the box below:

Visit Info

Finish

Cancel

FRAILITY CALCULATION:

Risk Analysis Index (RAI) score is:

Health Factors: VA-RAI FRAILITY SCORE

Ctrl + c to copy * Indicates a Required Field

CPRS Implementation Piping

Prior Risk Analysis Index (RAI)

02/03/2023 Risk Analysis Index (RAI) Frailty Score

Magnitude: 22

Risk Analysis Index (RAI) Frailty Score Without Cancer

Magnitude: 18

If there is no value, use the [Online RAI](#) to calculate the RAI; then record the value in the field below.

++ Significant frailty is indicated by scores greater than or equal to 37 ++

☒ Risk Analysis Index (RAI) Score: *22

☒ The RAI Score (without cancer) is: *18

☐ RAI score is greater than or equal to 37.



CPRS Implementation

RAI Reminder Dialogue Cover Sheet "User Group"

Thyroid nodule (SCT 237495005)
Legal problems/circumstances (ICD-9-CM V62.5)

<

☐ **Clinical Reminders**

Reminder	Due Date
RAI Frailty Score(Surgery)	DUE NOW
COVID-19 Immunization	DUE NOW
Influenza Immunization (PREV - NURSE/PROVIDER)	DUE NOW
Mammogram Screening (PREV - PROVIDER)	Oct 01, 2022
Med Recon (CDS - NURSE)	Jan 31, 2023
Relationship Health & Safety Screen (CDS - NURSE/PROVIDER)	Jan 28, 2023
Sexual Orientation (CDS - NURSE/PROVIDER)	DUE NOW
Med Reconciliation (CDS - PROVIDER)	Apr 20, 2023
Adv Dir/Psych (BH Nurse/Provider)	Jan 19, 2017
AIMS Test (BH Prov)	Feb 18, 2015
Antipsychotic Metabolic Monitoring	DUE NOW
MHTP Annual Note	Jul 17, 2023

☐ **Vitals**

Vital	Value	Date Taken	Conv. Value	Quals
-------	-------	------------	-------------	-------

CPRS Implementation

Goals of Care Note Template

VALUES

Patient Hopes:

*

- ☐ live as long as possible
- ☐ symptom relief
- ☐ be mentally aware
- ☐ be independent
- ☐ be at home
- ☐ able to maintain interpersonal relationships including family
- ☐ be a support for family
- ☐ cultural/spiritual beliefs

Other:

Patient Concerns:

*

- ☐ pain
- ☐ other physical suffering
- ☐ inability to care for self or others
- ☐ loss of control
- ☐ finances
- ☐ being a burden
- ☐ cultural/spiritual beliefs
- ☐ inability to meaningfully interact with others

Other:

Patient's hopes and concerns expanded:

*

File Edit View Action Options Tools Help

ZZ TESTDUCK, DAISY (OUTPATIENT)
000-00-0840 Apr 08, 1940 (82)

Last 250 Signed Notes (Total: 147)

- New Note in Progress
- Sep 07, 22 RAI FRAILITY TOOL, TES
- Signed notes by date range
 - Administrative Information
 - Adverse React/Allergy
- Templates**
- SURGERY
 - BARIATRIC COMPLICATIONS
 - BARIATRIC INITIAL POST OP FOLLOW UP VISIT
 - BARIATRIC INTERMEDIATE POST OP FOLLOW L
 - BARIATRIC PATIENT SELF ASSESS
 - CoC Colon Resection
 - CoC Excision for Melanoma
 - Informed Consent (Surgery)
 - INFUSION STOPPED
 - LESION EXCISION OP REPORT
 - SURGICAL PAUSE NOT INDICATED**
 - V4 PRE-OP RAI SCORE
 - VA-RAI FRAILITY SCORE
- TELEHEALTH
- PRE-ADMISSIONS/ADJACENT

Reminders

Encounter

New Note

Cover Sheet Problems Meds Orders Notes Consult

Surgical Pause Not Indicated

File Edit View Action Options Tools Help

ZZZWARD, RONALD M (OUTPATIENT)
000-00-7384 Jul 16, 1938 (84)

NONCOUN Jul 19, 22 08:07
Current Provider Not Selected

No PACT assigned at any VA location

COVID-19 Not Tested

Last 250 Signed Notes

ZZTEST TITLE 2

Vet: 07/19/22 NON COUNT-X

Jul 19, 2022@08:41

- New Note in Progress
- Jul 19, 22 ZZTEST TITLE 2, NON COUN
- Signed notes by date range
 - Peer Support Note
 - Sdpu Admission
- Templates**
- Informed Consent (Surgery)
- INFUSION STOPPED
- LESION EXCISION OP REPORT
- SURGICAL PAUSE NOT INDICATED**
- V4 PRE-OP RAI SCORE
- VA-RAI FRAILITY SCORE

Reminders

Encounter

New Note

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

Health Factors:
V4 SURGICAL PAUSE NOT INDICATED

Drag and Drop the template!



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“Surgical Pause Not Indicated”

When to use it and how to find it

Encounters for conditions not suitable for surgery (e.g., cerumen impaction, audiology testing, joint injection, etc.)

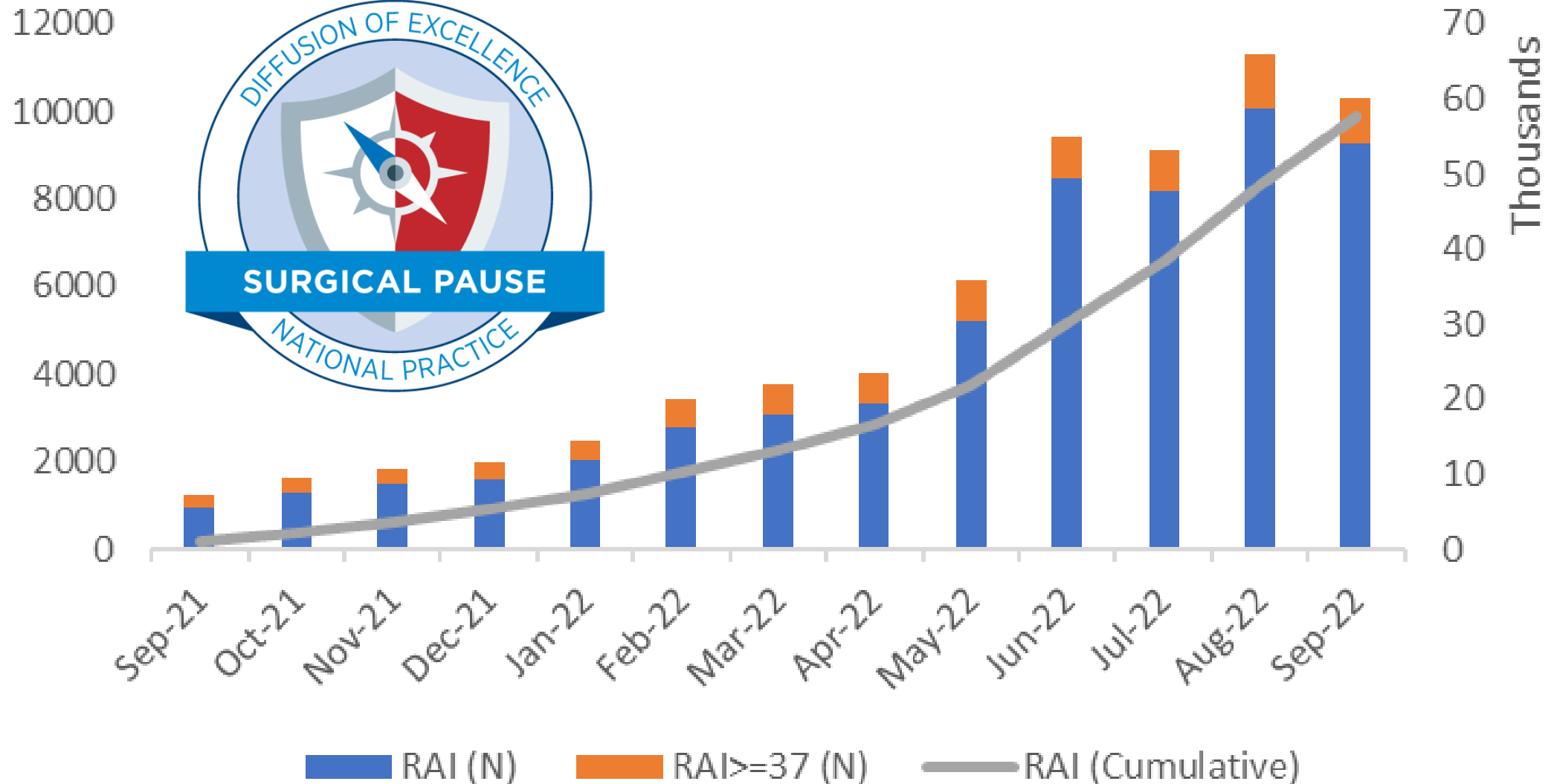
Encounters for conditions that do not yet indicate a potential role for surgery (e.g., slowly growing 4cm abdominal aortic aneurism).

Encounters when surgery is not offered or proposed as a legitimate option.

This screenshot shows the EHR interface for patient ZZ TESTDUCK, DAISY (OUTPATIENT). The 'Last 250 Signed Notes' list is visible, with the 'Templates' section highlighted by a red oval. In the list of templates, 'SURGICAL PAUSE NOT INDICATED' is also highlighted by a red oval. The interface includes a menu bar (File, Edit, View, Action, Options, Tools, Help) and a patient information header.

This screenshot shows the EHR interface for patient ZZZWARD, RONALD M (OUTPATIENT). A red arrow points from the 'Surgical Pause Not Indicated' template in the 'Templates' list to the 'New Note' section, indicating the action of dragging and dropping the template. The interface includes a menu bar (File, Edit, View, Action, Options, Tools, Help) and a patient information header.

RAI Implementation FY22



The Surgical Pause Dashboard



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium





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Refresh Bookmark Print Comment Star

Surgical Risk Analysis Index (RAI) Report



VISN, Facility

All

Location Name

All

RAI > 36

☐ Y

RAIWithout > 36

☐ Y

Primary Stop Code

All

CHAR4

All

Surgical Stop

☐ Y

Surg. Complexity

All

9/1/2021

12/13/2022

Visit Date



Back to RAI Detailed View

Advanced Locations

≥500 Scored Visits

27

Intermediate Locations

≥100 Scored Visits

10

Beginner Locations

≥50 Scored Visits

4

Exploratory Locations

<50 Scored Visits

33

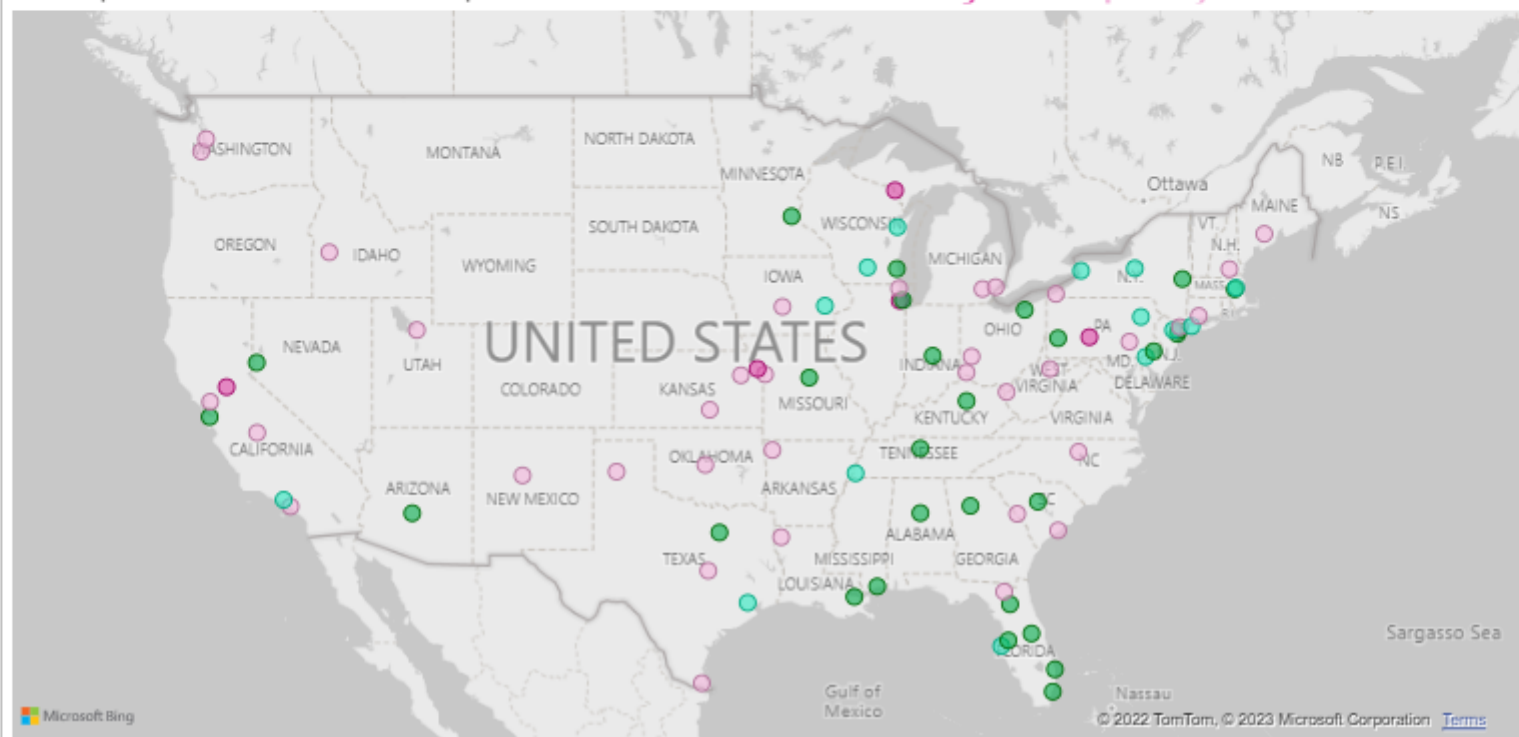
RAI Implementation Readiness Map:

Advanced

Intermediate

Beginner

Exploratory



Visits w/ RAI Score

86,352

Uniques w/ RAI Score

61,990

Visits w/ RAI >36

10,948

Uniques w/ RAI Score >36

9,824

Visits w/ RAI w/o C >36

1,217

Uniques w/ RAI w/o C >36

1,153

Urban

60,722

Rural

24,319

H. Rural

519



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Surgical Risk Analysis Index (RAI) Report



VA



U.S. Department of Veterans Affairs



Back to RAI Detailed View

VISN, Facility

6

Location Name

All

RAI > 36

☐ Y

RAIWithout > 36

☐ Y

Primary Stop Code

All

CHAR4

All

Surgical Stop

☐ Y

Surg. Complexity

All

9/1/2021



12/13/2022



Visit Date



Advanced Locations

≥500 Scored Visits

27

Intermediate Locations

≥100 Scored Visits

10

Beginner Locations

≥50 Scored Visits

4

Exploratory Locations

<50 Scored Visits

33

RAI Implementation Readiness Map:

Advanced

Intermediate

Beginner

Exploratory



Visits w/ RAI Score

7

Uniques w/ RAI Score

7

Visits w/ RAI >36

4

Uniques w/ RAI Score >36

4

Visits w/ RAI w/o C >36

2

Uniques w/ RAI w/o C >36

2

Urban

5

Rural

2

H. Rural

0



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Surgical Risk Analysis Index (RAI) Report

[Back to Terms & Conditions](#)VISN, Facility, Sta6a
Multiple selectionsLocation Name
AllRAI > 36
☐ YRAIWithout > 36
☐ YPrimary Stop Code
AllCHAR4
AllSurgical Stop
☐ YComplexity
All

9/1/2021 12/13/2022 Visit Date

VISN	Facility	Division	Patient	Visit Date	Primary Stop Code	RAI Score	RAI Score Without Cancer	Location Name
4	(642) Philadelphia, PA	642		10/4/2022	415-VASCULAR SURGERY	0		PHL VASCULAR SURGERY
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/3/2022	487-BARIATRIC SURG	0		UNV SSL BARIATRIC PREC
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/19/2022	415-VASCULAR SURGERY	0		UNV SSL VASCULAR FOL
4	(642) Philadelphia, PA	642		4/11/2022	414-UROLOGY CLINIC	1		PHL UROLOGY CONSULT
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		11/8/2022	424-TELEPHONE/SURGERY	1		UNV PH SSL IMPACT EVA
4	(642) Philadelphia, PA	642		11/3/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	642		10/25/2022	414-UROLOGY CLINIC	10		PHL UROLOGY SD CONSI
4	(642) Philadelphia, PA	642		11/4/2022	414-UROLOGY CLINIC	10		PHL UROLOGY ONCOLOK
4	(642) Philadelphia, PA	642		11/10/2022	404-GYNECOLOGY	10		PHL WH/GYN - CHESNOI
4	(642) Philadelphia, PA	642		11/22/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	642		12/5/2022	404-GYNECOLOGY	10		PHL WH/GYN - KINSON
4	(642) Philadelphia, PA	642		4/7/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	642		11/10/2022	404-GYNECOLOGY	10		PHL GYN NURSE CLINIC
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/28/2022	424-TELEPHONE/SURGERY	10		UNV PH SSL IMPACT EVA
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/20/2022	432-PRE-SURG EVAL	10		UNV CVT SSL IMPACT CBV

Protecting
the
InnocentVisits w/ RAI Score
3,412Uniques w/ RAI Score
3,193Visits w/ RAI >36
704Uniques w/ RAI Score >36
665Visits w/ RAI w/o C >36
80Uniques w/ RAI w/o C >36
79

Urban	Rural	H. Rural
2,656	731	11



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Surgical Risk Analysis Index (RAI) Report

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VISN, Facility, Sta6a

All

☐ 2☐ 3☐ (526) Bronx, NY☐ (561) New Jersey HCS (...)☐ (630) New York HHS (B...☐ (632) Northport, NY☐ 4

Location Name

All

RAI > 36

☐ Y

RAIWithout > 36

☐ Y

CHAR4

All

Surgical Stop

☐ Y

Complexity

All

9/1/2021

12/13/2022

Visit Date

Location	Patient	Visit Date	Primary Stop Code	RAI Score	RAI Score Without Cancer	Location Name
4	(646) Pittsburgh HCS (Pittsburgh PA)	10/4/2022	415-VASCULAR SURGERY	0		PHL VASCULAR SURGERY
4	(646) Pittsburgh HCS (Pittsburgh PA)	10/3/2022	487-BARIATRIC SURG	0		UNV SSL BARIATRIC PREC
4	(642) Philadelphia, PA	10/19/2022	415-VASCULAR SURGERY	0		UNV SSL VASCULAR FOL
4	(646) Pittsburgh HCS (Pittsburgh PA)	4/11/2022	414-UROLOGY CLINIC	1		PHL UROLOGY CONSULT
4	(642) Philadelphia, PA	11/8/2022	424-TELEPHONE/SURGERY	1		UNV PH SSL IMPACT EVA
4	(642) Philadelphia, PA	11/3/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	10/25/2022	414-UROLOGY CLINIC	10		PHL UROLOGY SD CONSI
4	(642) Philadelphia, PA	11/4/2022	414-UROLOGY CLINIC	10		PHL UROLOGY ONCOLOK
4	(642) Philadelphia, PA	11/10/2022	404-GYNECOLOGY	10		PHL WH/GYN - CHESNOI
4	(642) Philadelphia, PA	11/22/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	12/5/2022	404-GYNECOLOGY	10		PHL WH/GYN - KINSON
4	(642) Philadelphia, PA	4/7/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	11/10/2022	404-GYNECOLOGY	10		PHL GYN NURSE CLINIC
4	(646) Pittsburgh HCS (Pittsburgh PA)	10/28/2022	424-TELEPHONE/SURGERY	10		UNV PH SSL IMPACT EVA
4	(646) Pittsburgh HCS (Pittsburgh PA)	10/20/2022	432-PRE-SURG EVAL	10		UNV CVT SSL IMPACT CBV

Protecting
the
Innocent

Visits w/ RAI Score

3,412

Uniques w/ RAI Score

3,193

Visits w/ RAI >36

704

Uniques w/ RAI Score >36

665

Visits w/ RAI w/o C >36

80

Uniques w/ RAI w/o C >36

79

Urban

2,656

Rural

731

H. Rural

11



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Surgical Risk Analysis Index (RAI) Report

VISN, Facility, Sta6a

4 (VISN) + (646) Pittsburgh HCS (Pitt...

Primary Stop Code

All

Location Name

All

Search

☐ UNV SSL GEN SURG R...☐ UNV SSL GENERAL SU...☐ UNV SSL GENERAL SU...☐ UNV SSL GENERAL SU...☐ UNV SSL GU CONSULT☐ UNV SSL IMPACT

RAI > 36

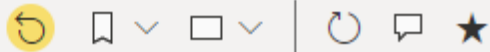
☐ Y

RAI w/out > 36

☐ Y

NSO Complexity

All

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9/1/2021

12/13/2022

Visit Date



VISN

Facility

DIV

Visit Date

Primary Stop Code

RAI on Name

Score

Visits w/ RAI Score

3,412

Uniques w/ RAI Score

3,193

Visits w/ RAI >36

704

Uniques w/ RAI Score >36

665

Visits w/ RAI w/o C >36

80

Uniques w/ RAI w/o C >36

79

Urban

2,656

Rural

731

H. Rural

11

Protecting
the
Innocent

4	(646) Pittsburgh HCS (Pittsburgh PA)	646
4	(646) Pittsburgh HCS (Pittsburgh PA)	646
4	(642) Philadelphia, PA	642
4	(646) Pittsburgh HCS (Pittsburgh PA)	646
4	(642) Philadelphia, PA	642
4	(642) Philadelphia, PA	642
4	(642) Philadelphia, PA	642
4	(642) Philadelphia, PA	642
4	(642) Philadelphia, PA	642
4	(642) Philadelphia, PA	642
4	(642) Philadelphia, PA	642
4	(642) Philadelphia, PA	642
4	(646) Pittsburgh HCS (Pittsburgh PA)	646
4	(646) Pittsburgh HCS (Pittsburgh PA)	646

10/3/2022	487-BARIATRIC SURG	0	UNV SSL BARIATRIC PREC
10/19/2022	415-VASCULAR SURGERY	0	UNV SSL VASCULAR FOL
4/11/2022	414-UROLOGY CLINIC	1	PHL UROLOGY CONSULT
11/8/2022	424-TELEPHONE/SURGERY	1	UNV PH SSL IMPACT EVA
11/3/2022	401-GENERAL SURGERY	10	PHL GENERAL SURGERY I
10/25/2022	414-UROLOGY CLINIC	10	PHL UROLOGY SD CONSI
11/4/2022	414-UROLOGY CLINIC	10	PHL UROLOGY ONCOLOK
11/10/2022	404-GYNECOLOGY	10	PHL WH/GYN - CHESNOI
11/22/2022	401-GENERAL SURGERY	10	PHL GENERAL SURGERY I
12/5/2022	404-GYNECOLOGY	10	PHL WH/GYN - KINSON
4/7/2022	401-GENERAL SURGERY	10	PHL GENERAL SURGERY I
11/10/2022	404-GYNECOLOGY	10	PHL GYN NURSE CLINIC
10/28/2022	424-TELEPHONE/SURGERY	10	UNV PH SSL IMPACT EVA
10/20/2022	432-PRE-SURG EVAL	10	UNV CVT SSL IMPACT CBV



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Surgical Risk Analysis Index (RAI) Report

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VISN, Facility, Sta6a

4 (VISN) + (646) Pittsburgh HCS (Pitt...

Location Name

All

RAI > 36

☐ Y

RAIWithout > 36

☐ Y

Primary Stop Code

All

Search

☐ Select all☐ 401-GENERAL SURGERY☐ 403-OTOLARYNGOLOGY/ENT☐ 406-NEUROSURGERY☐ 409-ORTHO/JOINT SURG☐ 411-PODIATRY

CHAR4

All

Surgical Stop

☐ Y

Complexity

All

9/1/2021

12/13/2022

Visit Date

Location	Patient	Visit Date	Primary Stop Code	RAI Score	RAI Score Without Cancer	Location Name
		10/4/2022	415-VASCULAR SURGERY	0		PHL VASCULAR SURGERY
		10/3/2022	487-BARIATRIC SURG	0		UNV SSL BARIATRIC PREC
		10/19/2022	415-VASCULAR SURGERY	0		UNV SSL VASCULAR FOL
		4/11/2022	414-UROLOGY CLINIC	1		PHL UROLOGY CONSULT
		11/8/2022	424-TELEPHONE/SURGERY	1		UNV PH SSL IMPACT EVA
		11/3/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
		10/25/2022	414-UROLOGY CLINIC	10		PHL UROLOGY SD CONSI
		11/4/2022	414-UROLOGY CLINIC	10		PHL UROLOGY ONCOLOK
		11/10/2022	404-GYNECOLOGY	10		PHL WH/GYN - CHESNOI
		11/22/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
		12/5/2022	404-GYNECOLOGY	10		PHL WH/GYN - KINSON
		4/7/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
		11/10/2022	404-GYNECOLOGY	10		PHL GYN NURSE CLINIC
		10/28/2022	424-TELEPHONE/SURGERY	10		UNV PH SSL IMPACT EVA
		10/20/2022	432-PRE-SURG EVAL	10		UNV CVT SSL IMPACT CBV

Protecting
the
Innocent

Visits w/ RAI Score

3,412

Uniques w/ RAI Score

3,193

Visits w/ RAI >36

704

Uniques w/ RAI Score >36

665

Visits w/ RAI w/o C >36

80

Uniques w/ RAI w/o C >36

79

Urban

2,656

Rural

731

H. Rural

11



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Surgical Risk Analysis Index (RAI) Report

[Back to Terms & Conditions](#)VISN, Facility, Sta6a
Multiple selectionsLocation Name
AllRAI > 36
☐ YRAIWithout > 36
☐ YPrimary Stop Code
AllCHAR4
AllSurgical Stop
☐ Y

NSO Complexity

All

Search

☐ Select all

☐ 1 - APC Basic

☐ 2 - APC Advanced

☐ 4 - Intermediate

☐ 5 - Complex

☐ 6 - Unassigned Complexity

2021 12/13/2022 Visit Date

VISN	Facility	Division	Patient	Visit Date	Primary Stop Code
4	(642) Philadelphia, PA	642		10/4/2022	415-VASCULAR S
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/3/2022	487-BARIATRIC S
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/19/2022	415-VASCULAR S
4	(642) Philadelphia, PA	642		4/11/2022	414-UROLOGY C
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		11/8/2022	424-TELEPHONE
4	(642) Philadelphia, PA	642		11/3/2022	401-GENERAL SURGERY
4	(642) Philadelphia, PA	642		10/25/2022	414-UROLOGY CLINIC
4	(642) Philadelphia, PA	642		11/4/2022	414-UROLOGY CLINIC
4	(642) Philadelphia, PA	642		11/10/2022	404-GYNECOLOGY
4	(642) Philadelphia, PA	642		11/22/2022	401-GENERAL SURGERY
4	(642) Philadelphia, PA	642		12/5/2022	404-GYNECOLOGY
4	(642) Philadelphia, PA	642		4/7/2022	401-GENERAL SURGERY
4	(642) Philadelphia, PA	642		11/10/2022	404-GYNECOLOGY
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/28/2022	424-TELEPHONE/SURGERY
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/20/2022	432-PRE-SURG EVAL

Protecting
the
Innocent

Visits w/ RAI Score
3,412Uniques w/ RAI Score
3,193Visits w/ RAI >36
704Uniques w/ RAI Score >36
665Visits w/ RAI w/o C >36
80Uniques w/ RAI w/o C >36
79

Urban	Rural	H. Rural
2,656	731	11



File Export Share Get insights



Surgical Risk Analysis Index (RAI) Report

[Back to Terms & Conditions](#)VISN, Facility, Sta6a
Multiple selectionsLocation Name
AllRAI > 36
☐ YRAIWithout > 36
☐ YPrimary Stop Code
AllCHAR4
AllSurgical Stop
☐ YComplexity
All

9/1/2021 12/13/2022 Visit Date

VISN	Facility	Division	Patient	Visit Date	Primary Stop Code	RAI Score	RAI Score Without Cancer	Location Name
4	(642) Philadelphia, PA	642		10/4/2022	415-VASCULAR SURGERY	0		PHL VASCULAR SURGERY
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/3/2022	487-BARIATRIC SURG	0		UNV SSL BARIATRIC PREC
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/19/2022	415-VASCULAR SURGERY	0		UNV SSL VASCULAR FOL
4	(642) Philadelphia, PA	642		4/11/2022	414-UROLOGY CLINIC	1		PHL UROLOGY CONSULT
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		11/8/2022	424-TELEPHONE/SURGERY	1		UNV PH SSL IMPACT EVA
4	(642) Philadelphia, PA	642		11/3/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	642		10/25/2022	414-UROLOGY CLINIC	10		PHL UROLOGY SD CONSI
4	(642) Philadelphia, PA	642		11/4/2022	414-UROLOGY CLINIC	10		PHL UROLOGY ONCOLOK
4	(642) Philadelphia, PA	642		11/10/2022	404-GYNECOLOGY	10		PHL WH/GYN - CHESNOI
4	(642) Philadelphia, PA	642		11/22/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	642		12/5/2022	404-GYNECOLOGY	10		PHL WH/GYN - KINSON
4	(642) Philadelphia, PA	642		4/7/2022	401-GENERAL SURGERY	10		PHL GENERAL SURGERY I
4	(642) Philadelphia, PA	642		11/10/2022	404-GYNECOLOGY	10		PHL GYN NURSE CLINIC
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/28/2022	424-TELEPHONE/SURGERY	10		UNV PH SSL IMPACT EVA
4	(646) Pittsburgh HCS (Pittsburgh PA)	646		10/20/2022	432-PRE-SURG EVAL	10		UNV CVT SSL IMPACT CBV

Protecting the Innocent

Visits w/ RAI Score
3,412Uniques w/ RAI Score
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79

Urban	Rural	H. Rural
2,656	731	11

Questions?



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



Tracking Process Measures and Outcomes with Data

Thomas Z. Hayward III, MD, MBA, FACS





Surgical Pause Symposium

Disclosures

1. Nothing financial to report



Surgery Information

- In God We Trust All Others Need to Bring Data!
- If you rely on standard data from the NSO then you will always be playing catch up
 - Quarterly report one quarter after the data is finalized
 - Almost a half a year has past from the earliest data
- Carpe diem



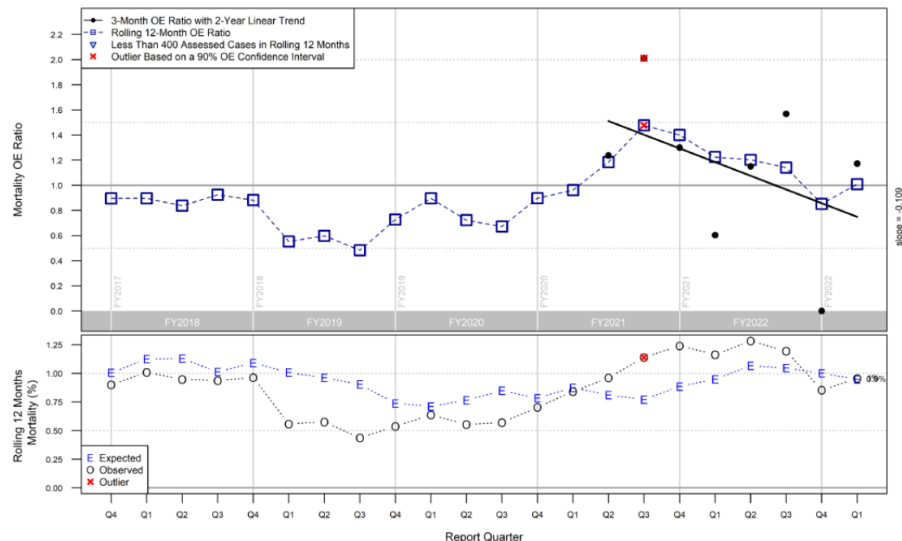
W. Edwards Deming

Mortality Data from NSO

Quality

VA National Surgery Office Quarterly Report: Q1 of FY23
VAMC Historic 30-Day Mortality O/E Ratio Plot with Quarterly O/E Ratio Trend
VAMC 583 - Indianapolis, IN VISN 10 Fiscal 2017 to 2023

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Quarterly VASQIP O/E Ratio History: FY22 Q1 through FY23 Q1

REPORT QUARTER	Analysis Cases	Observed Mortality N (%)	Expected Mortality N (%)	O/E Ratio	90% CI O/E Ratio
FY22 Q1	406	3 (0.74)	5.0 (1.23)	0.60	(0.16, 1.55)
FY22 Q2	447	7 (1.57)	6.1 (1.36)	1.15	(0.54, 2.15)
FY22 Q3	409	4 (0.98)	2.6 (0.62)	1.57	(0.54, 3.56)
FY22 Q4	374	0 (0.00)	2.7 (0.72)	0.00	(0.00, 1.11)
FY23 Q1	335	4 (1.19)	3.4 (1.02)	1.17	(0.40, 2.66)

CURRENT QUARTER: October 1, 2022 to December 31, 2022

Specialty of Surgeon	Analysis Cases	Observed Mortality N (%)	Expected Mortality N (%)	O/E Ratio	90% CI O/E Ratio
Cardiac Surgery	4	0 (0.00)	0.0 (1.21)	0.00	(0.00, 43.41)
ENT Surgeons	19	0 (0.00)	0.4 (1.89)	0.00	(0.00, 7.71)
General Surgeons	103	2 (1.94)	1.6 (1.52)	1.28	(0.23, 3.95)
Neurologic Surgeons	34	0 (0.00)	0.2 (0.55)	0.00	(0.00, 15.31)
Orthopedic Surgeons	63	1 (1.59)	0.3 (0.45)	3.50	(0.18, 16.11)
Plastic Surgeons	1	0 (0.00)	0.0 (0.08)	0.00	(0.00, 1183)
Thoracic Surgeons	14	0 (0.00)	0.2 (1.36)	0.00	(0.00, 14.17)
Urologic Surgeons	69	1 (1.45)	0.4 (0.51)	2.84	(0.15, 13.13)
Vascular Surgery	28	0 (0.00)	0.4 (1.52)	0.00	(0.00, 6.68)
VASQIP Combined	335	4 (1.19)	3.4 (1.02)	1.17	(0.40, 2.66)

- *Indy still has issues*
- *We are learning*
- *We are improving*



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium

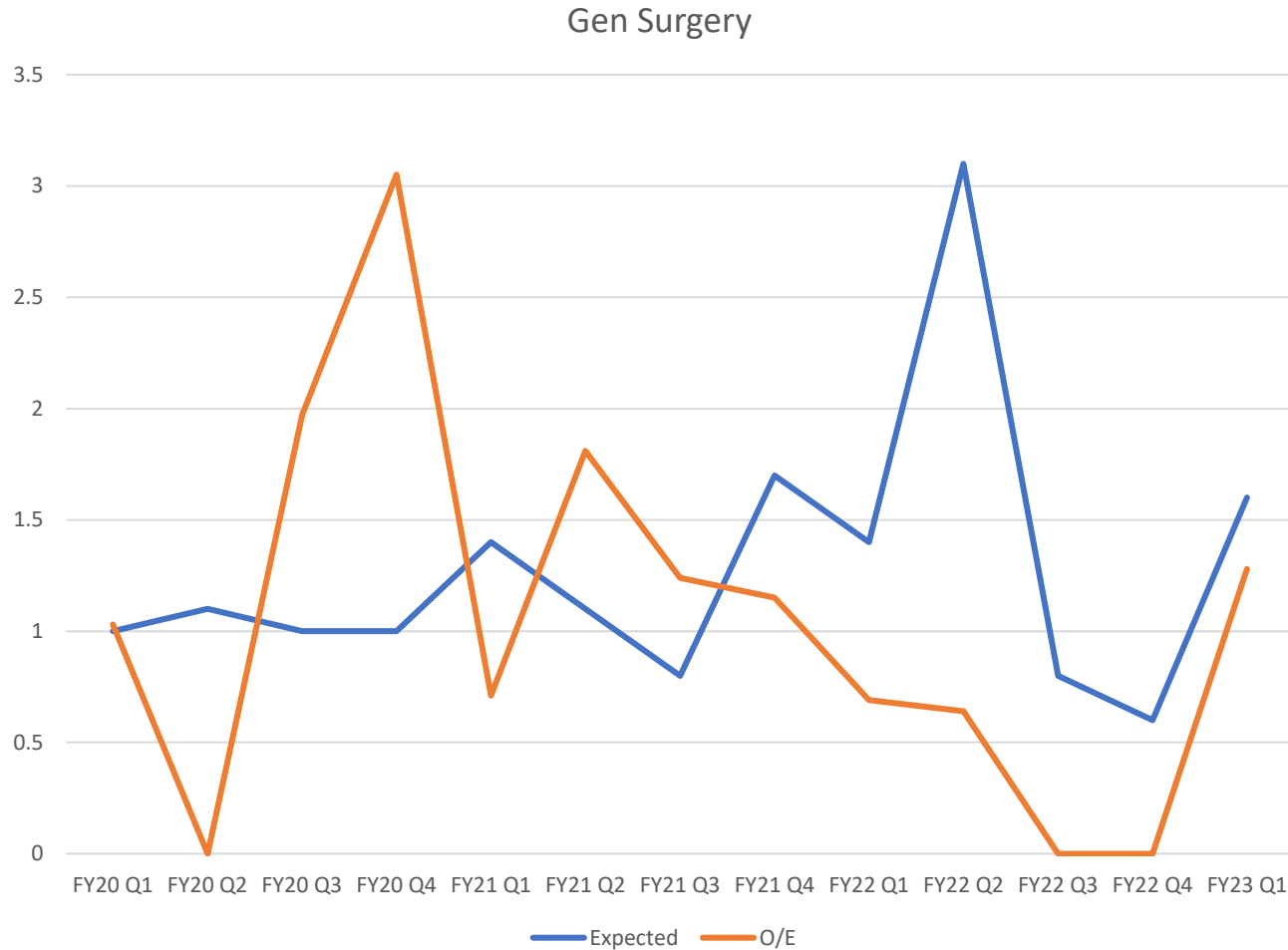


Mortality

- Models are highly predictive of M&M over enough cases
- Random walk of luck and misfortune because individual center numbers don't adequately sample each quarter
- The service will either take credit for when they are lucky or whine that their patients were sicker
- The goal is not to withhold needed surgery nor to tell surgeons what they should do, rather, to identify the highest risk patients and provide access to additional resources designed to facilitate patient-centered decision making and optimize peri-operative care
- When fully documented the risks will balance out over time

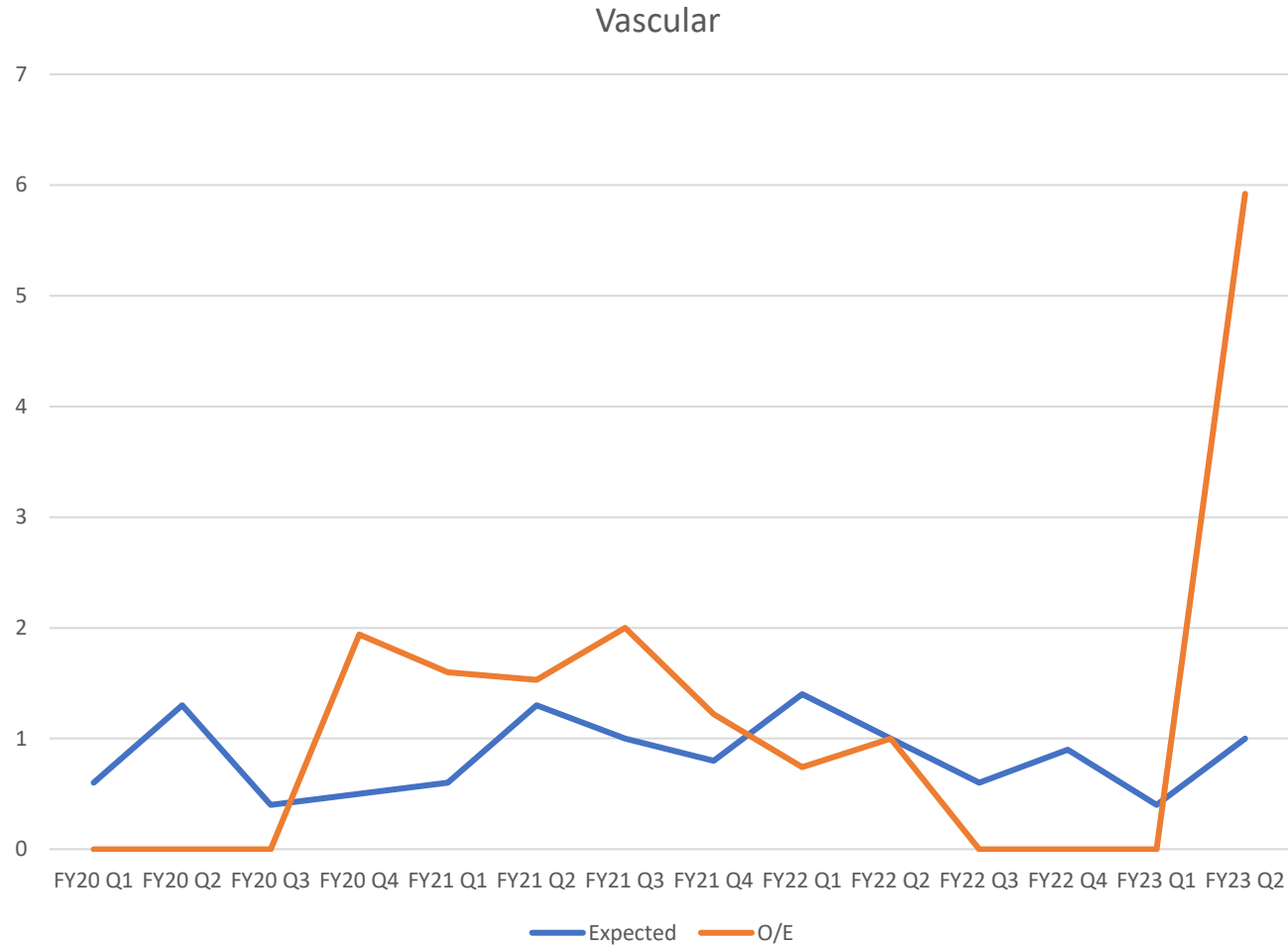


Mortality Data – Break it Out by Services Lines



- This chart shows that relationship between how the service documents expected mortality and its effect on the OE ratio which is there ultimate judgment point on the NSO report for M&M
- Whack a mole problem but if you are monitoring your expected mortality, you can make faster corrections

The Dangers We All Face



- *Vascular Surgery is high risk*
- *At Indy resistant to change the process because they had 3 quarters without a death*
- *All reviews care appropriate – level 1*
- *Teaching opportunity*

Create Information

- Reports are sent on a weekly/monthly/quarterly basis that contain lots of data in spreadsheets
- Summarize the data
- Show perspective of data over time
- Demonstrates tradeoffs, rationale, and consequences
- Be additive and give concrete examples of patients helped or hurt by shortages and policies

January 2022 – Present

Total FTE for OR Room Utilization	Staff Lost	Staff Gain	Remaining Open positions	Current Vacancy Rate (on paper)	Current FTE OFF orientation can be fully utilized	# Of Agency RN Support	True Operational Capacity per OR staffing	# Of Utilized OR rooms/Total OR rooms
58	31	18	13	22%	34	6	69%	6.5/11

Staff in Orientation	Discipline	Start Date	~Orientation Time	~Orientation End Date	Room Impact Progress	Room Impact (# of rooms open)	~Date OR room increase
A	RN	11/20/2022	6 months	6/2/2023		7.5 rooms	6/20/2023
B	RN	12/4/2022	6 months	5/22/2023		7.5 rooms	6/20/2023
C	RN	1/3/2023	6 months	6/2/2023		7.5 rooms	6/20/2023
D	CST	4/9/2023	3 months	7/5/2023			
E	RN	4/9/2023	4 months	8/15/2023			
F	RN	4/9/2023	4 months	8/15/2023			
G	RN	4/24/2023	4 months	8/15/2023			
H	RN	12/19/2022	9 months	9/15/2023			
I	CST	4/9/2023	6 months	9/15/2023			
K	RN	4/9/2023	9 months	12/15/2023			
Agency RN							
X	RN	4/12/2023	2 weeks	5/3/2023			
Fee Basis Contractors							

ASA

Quarter	National	ASA 1	average	SD	90% low	90% High	National2	ASA 2	average3	SD4	90% low5	90% High6	National7	ASA 3
FY20 Q1	1.60%	0.60%	0.60%				24.30%	12.80%	12.80%				64.10%	66.20%
FY20 Q2	1.60%	1.60%	0.60%	0.71%	-0.57%	1.77%	23.80%	12.80%	12.80%	0.00%	12.80%	12.80%	64.40%	66.20%
FY20 Q3	1.50%	0.70%	0.97%	0.55%	0.06%	1.88%	23.00%	12.20%	12.60%	0.35%	12.03%	13.17%	64.70%	66.90%
FY20 Q4	1.40%	0.60%	0.88%	0.49%	0.07%	1.68%	22.10%	11.40%	12.30%	0.66%	11.21%	13.39%	65.30%	68.70%
FY21 Q1	1.30%	0.40%	0.78%	0.47%	0.00%	1.56%	21.60%	11.00%	12.04%	0.82%	10.69%	13.39%	65.70%	70.20%
FY21 Q2	1.30%	0.50%	0.73%	0.44%	0.01%	1.45%	21.40%	11.70%	11.98%	0.74%	10.76%	13.21%	66.00%	71.30%
FY21 Q3	1.40%	0.50%	0.70%	0.41%	0.03%	1.37%	21.90%	12.10%	12.00%	0.68%	10.88%	13.12%	66.20%	72.50%
FY21 Q4	1.40%	0.60%	0.69%	0.38%	0.06%	1.31%	21.90%	12.30%	12.04%	0.64%	10.98%	13.09%	66.40%	73.60%
FY22 Q1	1.40%	0.60%	0.68%	0.36%	0.09%	1.27%	21.50%	13.30%	12.18%	0.73%	10.97%	13.38%	66.80%	74.00%
FY22 Q2	1.30%	0.50%	0.66%	0.34%	0.10%	1.22%	21.20%	14.90%	12.45%	1.10%	10.63%	14.27%	67.30%	74.00%
FY22 Q3	1.20%	0.20%	0.62%	0.35%	0.04%	1.20%	32.90%	16.80%	12.85%	1.68%	10.08%	15.61%	58.00%	81.00%
FY22 Q4	1.30%	0.70%	0.63%	0.34%	0.07%	1.18%	21.10%	17.30%	13.22%	2.05%	9.83%	16.60%	67.80%	72.60%
FY23 Q1	1.30%	0.70%	0.63%	0.32%	0.10%	1.16%	21.10%	17.20%	13.52%	2.25%	9.80%	17.24%	67.90%	72.60%

- ASA score has major impact on M&M prediction models
- Gen Surg
 - 5 – OR of 21.9
 - 4 – OR of 9.2
 - 3 – OR of 4.3
- Ortho
 - 5 – OR of 14.9
 - 4 – OR of 5.4
 - 3 – OR of 2.8
- Cardiac and Vascular not in the mortality model

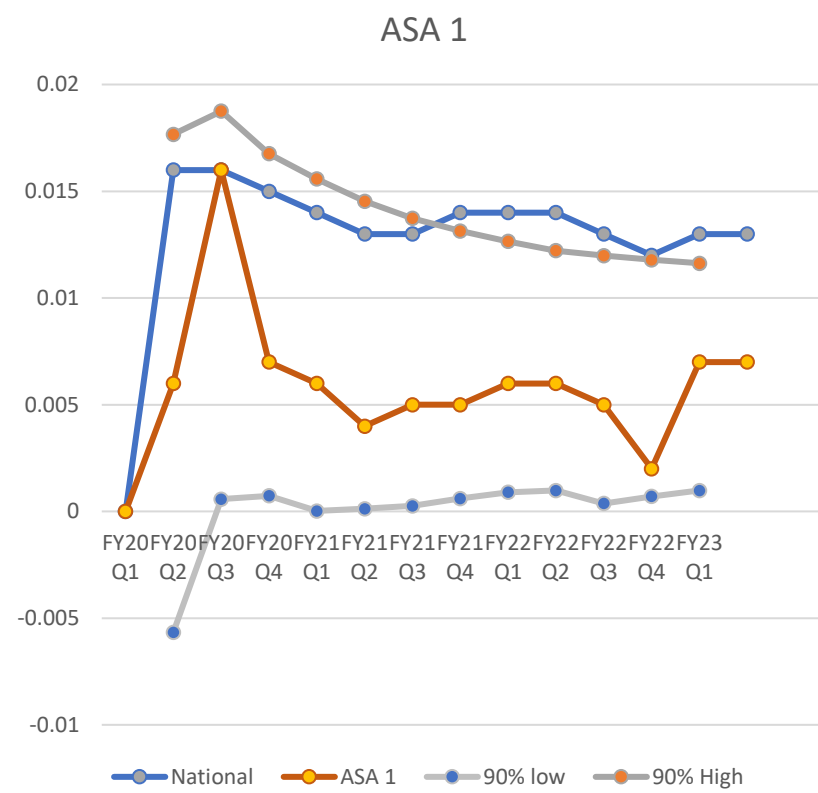
Process

- Because the ASA has such a significant impact on most mortality prediction models you will be audited
- The first question especially for 1A facilities is why is your ASA above the national average?
- You need to have show that you have a process
 - Standard definitions
 - Internal consistency
 - Internal audits
 - Internal communication
- Idea situation for statistical process control charts



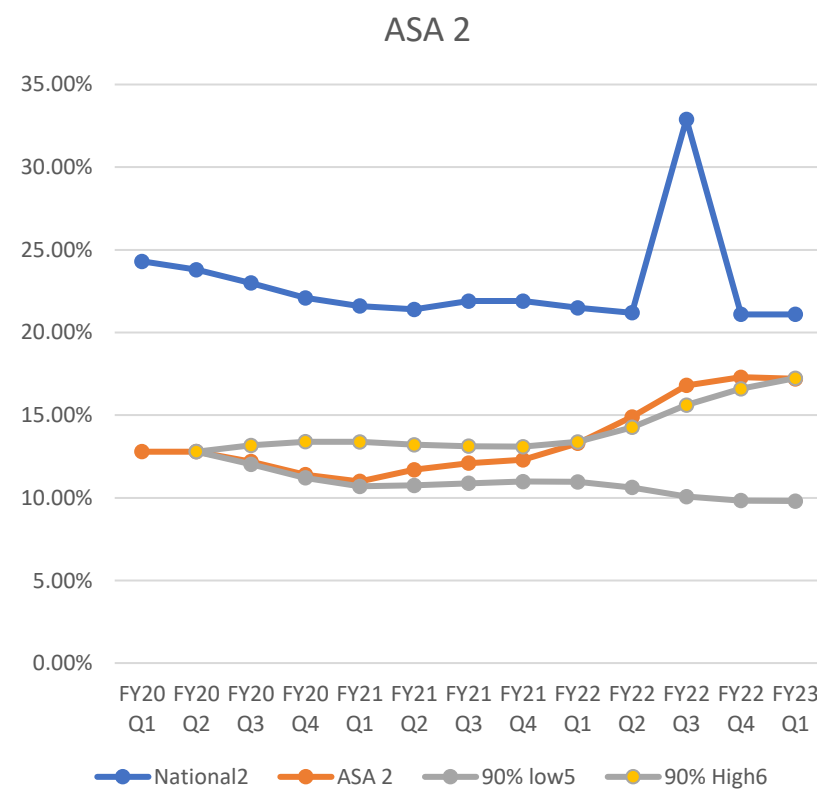
Lake Wobegon, where all the women are strong, all the men are good-looking, and all the children are above average

ASA 1



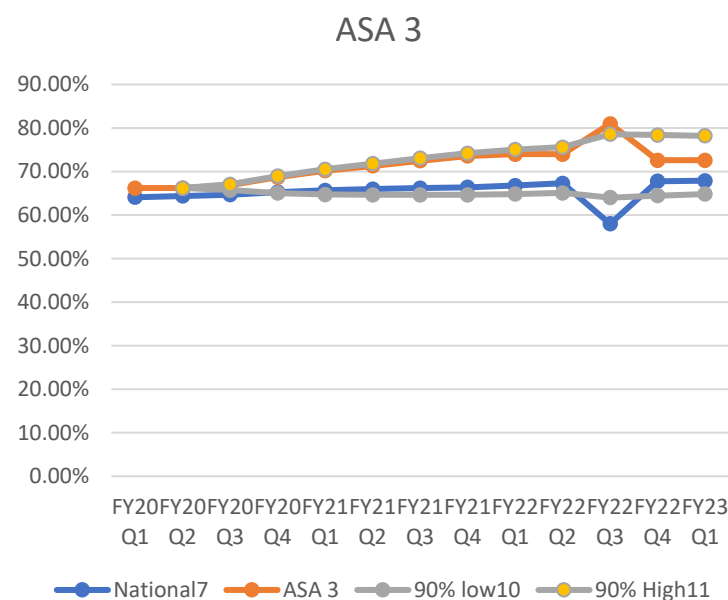
Healthy, non-smoking, no or minimal alcohol use

ASA 2



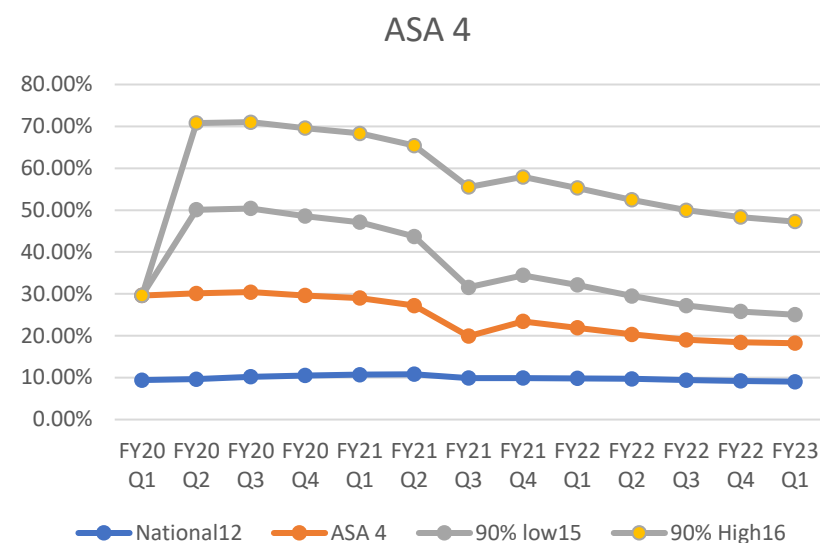
Mild diseases only without substantive functional limitations
Current smoker, social alcohol drinker, pregnancy, obesity
(30<BMI<40), well-controlled DM/HTN, mild lung disease

ASA 3



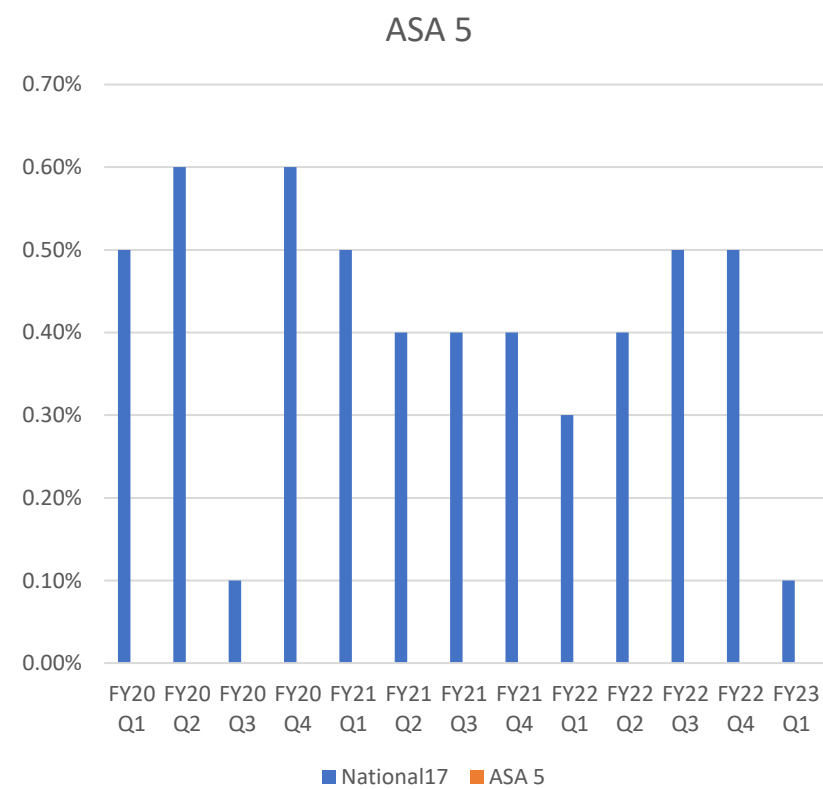
Substantive functional limitations
One or more moderate to severe diseases.
Poorly controlled DM or HTN, COPD, morbid obesity (BMI ≥40), active hepatitis, alcohol and/or drug dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction (35-50%), ESRD undergoing regularly scheduled dialysis, history (>3 months) of MI, CVA, TIA, or CAD/stents. Frailty score ≥37 but <45, dementia/delirium/impaired cognition or sensorium

ASA 4



Emergent case Severe sepsis -sepsis with organ failure or intubation or delirium, Home Oxygen or Room air saturation ≤90%, CHF NYHA class III/IV - EF ≤35%, Positive stress test preop, Hospitalization LOS >48 hours for chronic medical condition in the past year, Frailty score ≥45, Unintentional weight loss ≥10 lbs in 3 months or BMI ≤18.5, On Dialysis or CRRT – if regularly scheduled dialysis, then issues with hypotension or other medical events requiring intervention during runs < 3 months prior, Emergent case tubal pregnancy or septic abortion, Cancers: HCC, lung ca, esophageal, metastatic any type, pancreatic ca, gastric ca, cholangiocarcinoma, SCCA of tongue or larynx, intracranial mass/tumor Ortho: Removal of infected knee or hip implant, Open fracture ≥75, Hip fx ≥75, Vascular: AAA repair, TAA repair, carotid surgery or stenting, inpatient revascularization, amputation (BKA or AKA for gangrene) Thoracic: empyema, cardiac window, Dyspnea at rest or inability to climb one flight of stairs, Strangulated or incarcerated hernia – emergency surgery, Myocardial infarction, CVA, TIA or CAD/stents < 3 months prior to surgery

ASA 5



ASA 5 - Diagnoses that require this class

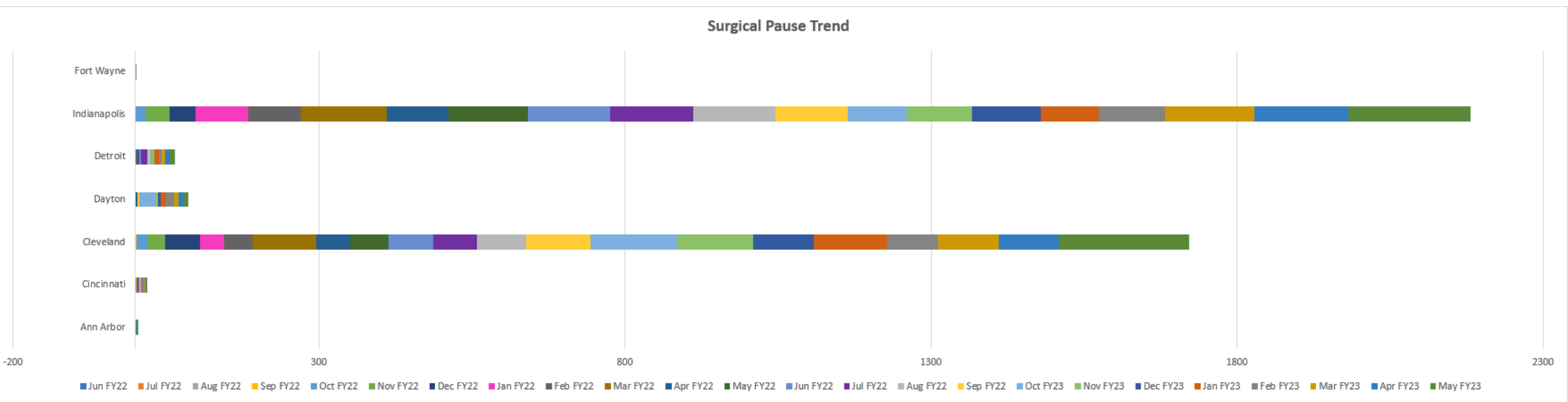
1. Massive Transfusion Activated for Surgery or active transfusion in progress to stabilize
2. patient on pressors or inotropes preop intravenous drips
3. Ruptured AAA
4. Mesenteric Ischemia
5. Active MI (STEMI, NSTEMI) at time of surgery
6. IABP in place preop
7. MSOF - Multisystem organ failure

Going back to FY17 Q4 though FY 23 Q1 ASA 5's <0.1% despite many cases that meet above criteria

Frailty Screening

- Dependency has major impact on mortality prediction and frailty screening is the best way to document
- Gen Surg
 - Total dep – 3.4
 - Partial dep – 1.7
 - Cognitive – 1.4
- Ortho
 - Total dep – 2.1
 - Partial dep – 1.7
 - Cognitive – 1.6
- Also contributes to multiple other specialties like cardiac, neurosurgery, urology, etc.





RAI Frailty Assessment by Location (based on VA-RAI FRAILITY SCORE health factor)
Data Source:CDWork.HF.Healthfactortype; Outpat.Visit; Spatient.Spatient
Data Prepared By: V10 Reporting Team

This report is not intended to replace CPRS / Medical Record. Data should be validated against CPRS / Medical Record.

Data for facility: (583) Indianapolis, IN. Date range: 10/1/2022 - 12/31/2022

[Feedback](#)

Facility	Stop Code Desc	Location Name	Location Total	Patient Name	Last 4	Visit Date/Time	Health Factor Date/Time	Frailty Score
583		7TH FLOOR	8			10/3/2022 7:46:00 AM	10/3/2022 7:46:00 AM	25
						10/14/2022 11:19:00 AM	10/14/2022 11:19:00 AM	29
						10/19/2022 9:40:00 AM	10/19/2022 9:40:00 AM	56
						11/22/2022 2:52:00 PM	11/22/2022 2:52:00 PM	
						12/5/2022 9:12:00 AM	12/5/2022 9:12:00 AM	
						12/8/2022 8:23:00 AM	12/8/2022 8:23:00 AM	
						12/10/2022 8:00:00 AM	12/10/2022 8:00:00 AM	
						12/27/2022 11:25:00 AM	12/27/2022 11:25:00 AM	
						12/15/2022 1:48:00 PM	12/15/2022 1:48:00 PM	
						10/28/2022 2:32:00 PM	10/28/2022 2:32:00 PM	52
		7TH FLOOR OBS	1			11/30/2022 6:47:00 PM	11/30/2022 6:47:00 PM	
		8A NORTH	3			12/19/2022 8:21:00 AM	12/19/2022 8:21:00 AM	
						10/19/2022 10:21:00 AM	10/19/2022 10:21:00 AM	37
		8A SOUTH	8			11/7/2022 6:39:00 AM	11/7/2022 6:39:00 AM	41
						11/10/2022 4:08:00 AM	11/10/2022 4:08:00 AM	37
						11/13/2022 7:26:00 AM	11/13/2022 7:26:00 AM	21
						11/27/2022 8:05:00 AM	11/27/2022 8:05:00 AM	
						12/10/2022 7:56:00 AM	12/10/2022 7:56:00 AM	
						12/20/2022 6:13:00 PM	12/20/2022 6:13:00 PM	
						12/28/2022 9:38:00 AM	12/28/2022 9:38:00 AM	
						11/17/2022 10:22:00 AM	11/17/2022 10:22:00 AM	
		ICU	2			12/28/2022 12:51:00 PM	12/28/2022 12:51:00 PM	
		STEPDOWN 4A	4			10/31/2022 2:38:00 PM	10/31/2022 2:38:00 PM	50
						11/23/2022 6:40:00 AM	11/23/2022 6:40:00 AM	
						12/6/2022 8:36:00 AM	12/6/2022 8:36:00 AM	
						12/19/2022 3:59:00 PM	12/19/2022 3:59:00 PM	
	109 - NUC MED & PET (NM & PET)	IN PET IMAGING	1			11/21/2022 7:30:00 AM	11/21/2022 7:30:00 AM	
	130 - EMERGENCY DEPT	IN ER	8			10/7/2022 5:16:00 AM	10/7/2022 5:16:00 AM	1
						10/17/2022 8:14:00 AM	10/17/2022 8:14:00 AM	25
						10/30/2022 4:43:00 PM	10/30/2022 4:43:00 PM	51
						11/1/2022 1:11:00 PM	11/1/2022 1:11:00 PM	34
						11/3/2022 12:22:00 PM	11/3/2022 12:22:00 PM	53
						11/22/2022 5:39:00 PM	11/22/2022 5:39:00 PM	
						11/30/2022 10:54:00 AM	11/30/2022 10:54:00 AM	
						12/15/2022 3:29:00 AM	12/15/2022 3:29:00 AM	

Internal Frailty Data

FY23 Q2

Service line	total inpatient cases	RAI note done within 6 months of surgery	
		date	Percentage
CARDIAC	16	16	100
ENT	27	10	37
GEN SURG	87	20	23
GYN	2	2	100
NEUROSURG	27	22	81
ORTHOPAEDICS	54	45	83
PLASTICS	2	0	0
PODIATRY	6	0	0
THORACIC	11	3	27
UROLOGY	94	2	2
VASCULAR	50	5	10
total	376	125	33%

May 2023

Service line	total inpatient cases	RAI note done within 6 months of surgery	
		date	Percentage
CARDIAC	5	5	100
ENT	12	6	50
GEN SURG	22	9	41
GYN	0	0	N/A
NEUROSURG	9	9	100
ORTHOPAEDICS	12	11	92
PLASTICS	1	0	0
PODIATRY	2	0	0
THORACIC	1	0	0
UROLOGY	32	0	0
VASCULAR	8	0	0
total	104	40	38%

- *Data Query from CPRS data*
- *RAI Frailty separate note within 6 months of Surgery date – Inpatient Surgery or ≥ 75 years of age*

Actions to Reduce SSI

- Improve glucose control through Peri-Operative Period
 - Insulin gtt during intraoperative phase if BG >180 x 2 during case especially with Hbg A1C >=8% preop, Daily insulin needs >=30 units, prednisone >=20 mg
 - Increase use of insulin gtt easier control and conversion by ICU team in AM
- Dirty/Infected cases –
 - Washout of the abdominal or chest cavity or surgical wound extensively with liters of crystalloid until completely clear then washout with 3, 6, 9 or more liters of saline with chloropactin
 - Consider allowing wound to heal with wound vac and non closure of skin
- Nutrition screen for all patients with planned admission to the ICU or Step down or ≥75 yo
 - BMI < 18.5
 - Age ≥ 75
 - Patient scheduled for ICU or Step-Down ICU admission
 - Either question on RAI frailty screen nutrition question is positive
- Chlorohexidine baths –
 - new improved comprehensive pathway to make sure all inpatients get a bath and improved patient education
 - Wash and document your own chlorohexidine bath after shaving and before prepping. Must dry after chlorohexidine bath.
- Chronic wounds or heavy scar formation
 - Consider use of Xperience in deep wounds external to organ space
- Prevena
 - Groin wounds and abdominal wall reconstructions

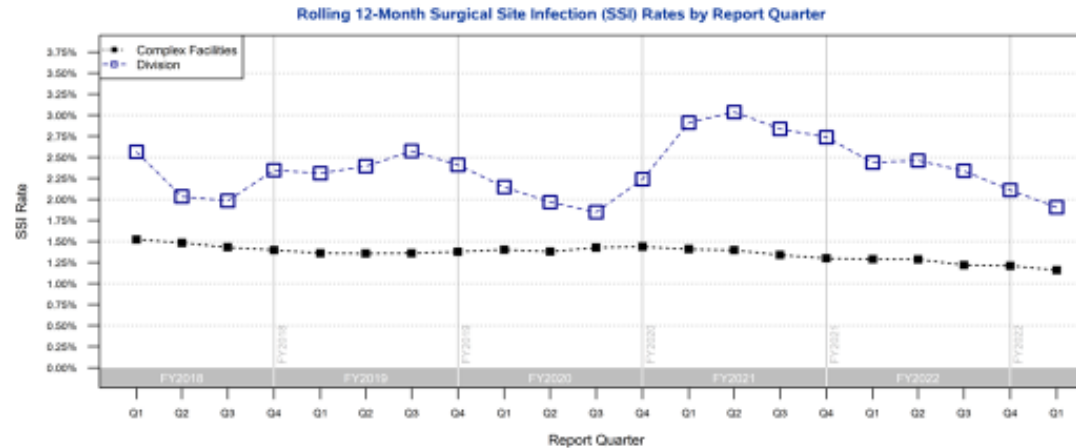


Surgical Site Infections

Quality

VA National Surgery Office Quarterly Report: Q1 of FY23
Wound Report: VAMC vs. National
VAMC 583 - Indianapolis, IN Fiscal 2018 to 2023

[Return to Contents](#)



Wound Class	VAMC 583 Current Quarter					VAMC 583 Rolling 12 Months					National Rolling 12 Months			
	Analysis Cases	SSI Rate	Superficial	Deep	Organ/ Space	Analysis Cases	SSI Rate	Superficial	Deep	Organ/ Space	SSI Rate	Superficial	Deep	Organ/ Space
Clean	213	0.0%	0.0%	0.0%	0.0%	1,005	1.2%	0.7%	0.3%	0.2%	0.7%	0.4%	0.2%	0.1%
Clean/Contaminated	115	2.6%	0.9%	0.9%	0.9%	535	1.9%	0.9%	0.4%	0.6%	1.4%	0.6%	0.2%	0.5%
Contaminated	14	7.1%	0.0%	0.0%	7.1%	54	5.6%	0.0%	0.0%	5.6%	3.9%	1.6%	0.7%	1.6%
Infected	21	4.8%	4.8%	0.0%	0.0%	85	8.2%	3.5%	1.2%	3.5%	2.9%	1.1%	0.8%	1.1%

This page utilizes all VASQIP assessments for calculation of infection rates.
For a complete description of the statistics displayed on this page, please see the NSO Quarterly Report Interpretation Document.

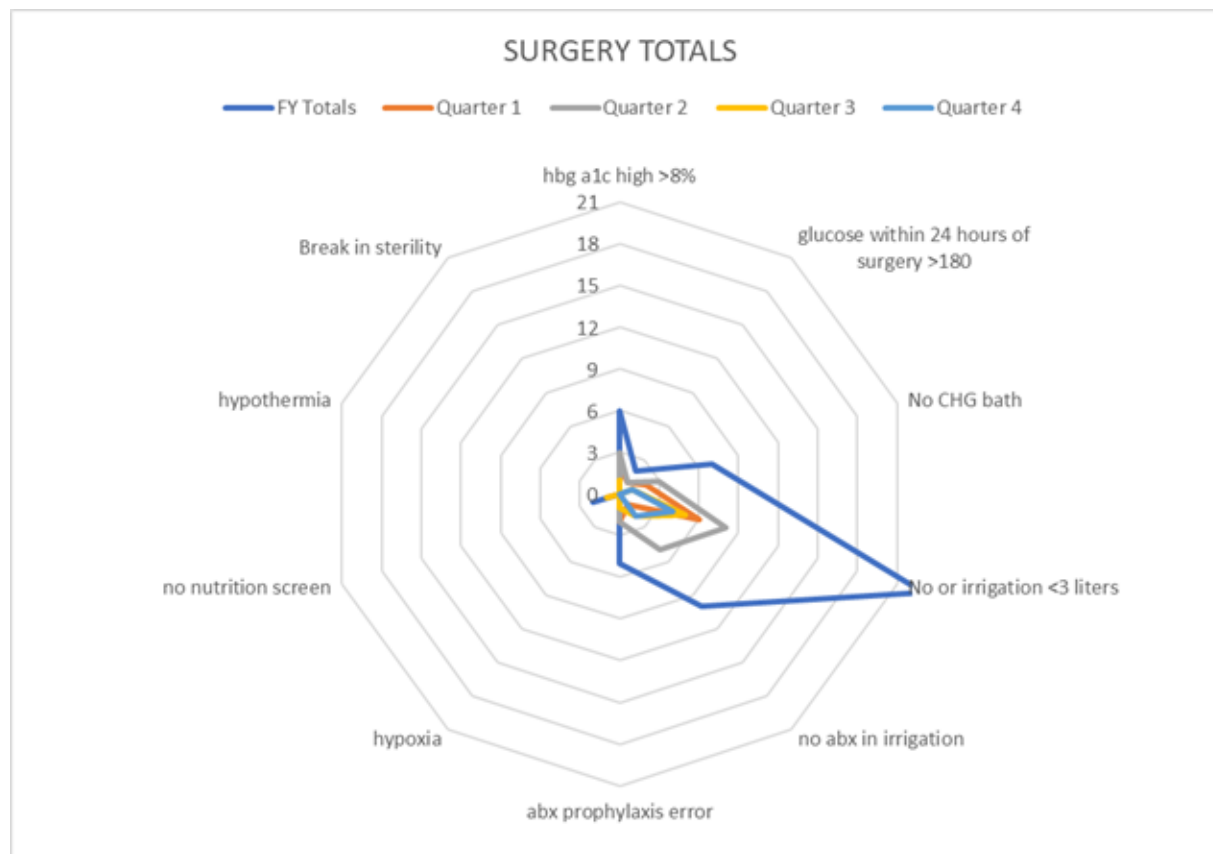
These documents or records or information contained herein, which resulted from the VA National Surgery Office are confidential and privileged under the provisions of 38 USC 5705 and its implementing regulations. This material will not be disclosed to anyone without authorization as provided for by that law or its regulations. The statute provides for fines up to \$20,000 for unauthorized disclosures.

NSO Surgery Report Q1 FY23 Page 22 of 57

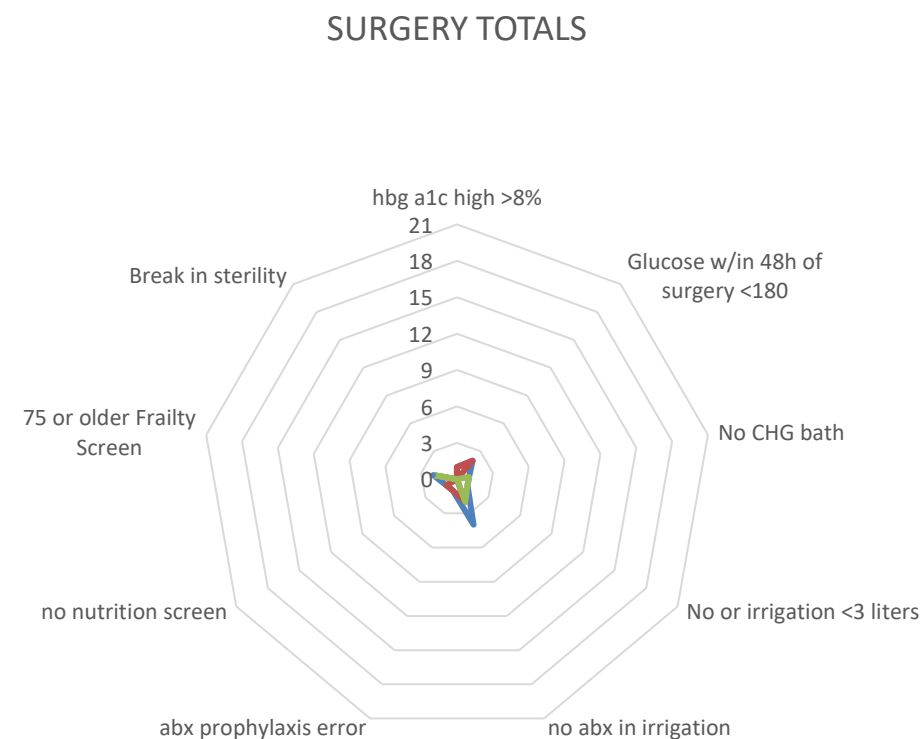
- Not a quick fix
- Changing the system takes time
- Teaching surgeons, residents and staffs how to do things better
- Track multiple recommendations compliance with radar charts

Radar Charts for SSI Risk Factors

FY 2022



FY 2023



Stop Light Report

Category	Goal
Volume	>= 600/m
Mortality	O/E ratio
Morbidity	O/E <1
SSI	
CLEAN	0.7%
CLEAN-CONTAMINATED	1.4%
CONTAMINATED	3.5%
DIRTY/INFECTED	2.9%
Clinic Access	
new patients	
stat consults	

OR Efficiency	Standard %
First Starts	0.85
Cancellations	0.06
Block Utilization	0.80
Add Ons	
Total utilization	0.80
	Standard in Minutes
Avg Turnover Time	30
Cardiac	50
ENT	35
General	35
GU	35
GYN	35
Neuro	50
Ophtho	20
Ortho	35
Pain	20
Plastics	35
Podiatry	35
PV	50
Thoracic	50

- Summarizes reports for Surgery Committee on monthly basis
- Colors in columns adjust to whether above or below standard
- Quick way to convey a lot of information without having it take up much time in committee



Summary

- Track information is as real time as possible
- Summarize with graphs, charts and tables
- We are in a learning profession and take every unexpected or unfortunate event as a learning opportunity
- Resist the temptation to make it a force function of the leader
- Encourage and enable your team to take responsibility for their own data and make corrections
- It is not necessary to change. Survival is not mandatory





Surgical Pause Symposium



VA Operating Room Standardization

Diffusion Fellows: Dr. Andrew Harris, Dr. Brittany Levy, Dr. Wesley Stephens, and Sherry Lantz



Variance in Operating Room Setup



Practice Overview

OR setup is not standard and varies significantly based on OR staff. This causes inefficiency, frustration, and lack of familiarity when staff changes during a case. These inefficiencies create unnecessary waste and likely contribute to patient safety events.

The solution is to engage and empower front-line staff stakeholders to develop a standard setup utilizing visual aids. It is a simple straightforward solution, getting back to basics, a picture providing a standard setup.

The process improvement has made our surgeons more confident, empowered the staff, provided psychological safety to employees, and provided a consistently safer surgical experience for veterans.



High Reliability Organization

- Background - The VHA has a mission to be a high reliability organization
- High reliability occurs when organizations can demonstrate **Reproducible Excellence**

The screenshot shows the official website of the U.S. Department of Veterans Affairs (VA) Health Services Research & Development (HSR&D) Forum. The page is titled "FORUM" with the tagline "translating research into quality healthcare for Veterans". The main content area features a dark blue header with the VA logo and the text "U.S. Department of Veterans Affairs". Below this, there are navigation links for "Veterans Benefits and Health Care", "About VA", and "Find a VA Location". The main content area is titled "Health Services Research & Development" and includes a sidebar with a list of links: "HSR&D Home", "About Us", "COVID-19 Efforts", "Research Impacts & Awards", "Research Topics", "Career Development Program", "Centers and Research Networks", "Cyberseminars", "Partnered Research", "For Managers", "For Researchers", "For Veterans", "Funding", "Meetings", and "News | Features | Multimedia". The main content area also includes a section titled "Becoming a High Reliability Organization" with a "Summer 2020" date and a link to "Back to Table of Contents". Below this, there is a "Commentary" section titled "VHA's Vision for a High Reliability Organization" by Richard A. Stone, MD, and Steven L. Lieberman, MD, MBA, FACHE.



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



When we think about reproducible excellence, what does that mean?

How do you know you are getting a quality product, every time?



Standardization

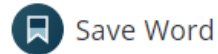
Merriam-Webster SINCE 1828

GAMES & QUIZZES | THESAURUS | WORD OF THE DAY | FEATURES | SHOP

standardization

Dictionary Thesaurus

standardize verb



Save Word

stan·dard·ize | \ 'stan-dər-, dīz \

standardized; standardizing; standardizes

Definition of *standardize*

transitive verb

1 : to bring into conformity with a standard especially in order to assure consistency and regularity

// trying to *standardize* testing procedures

// There ought to be a law *standardizing* the controls for hot and cold in hotel and motel showers.

— Andrew A. Rooney

// These rectangular steel boxes, first used about fifty years ago, revolutionized the transportation of freight by *standardizing* the size and shape of the container, enabling it to be moved seamlessly from boat and barge to rail or truck.

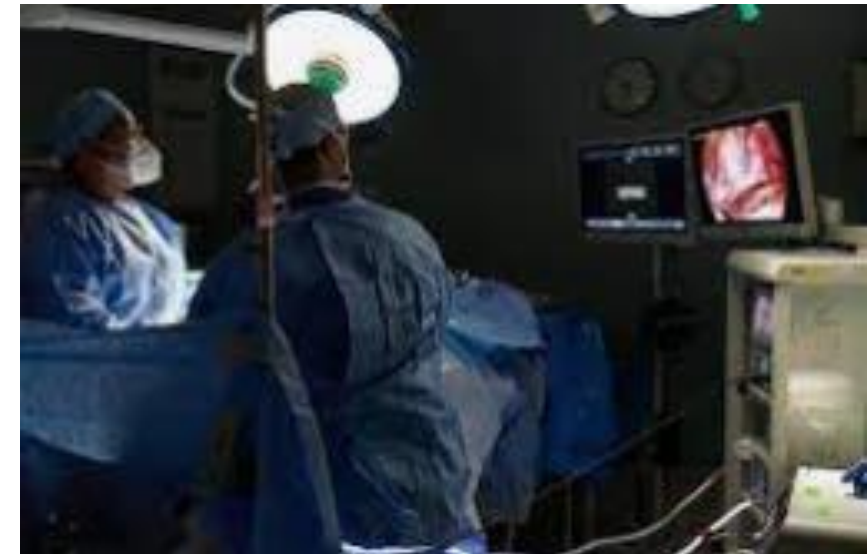
— James McCommons

How to Standardize



OR Standardization is important, so how to standardize? To do this, we devised a process where we first measured the problem, collaborated with the front-line staff to create a standard setup template, measured the success, audited the change, began an incentive structure, and then spread it to the full scope of practice.

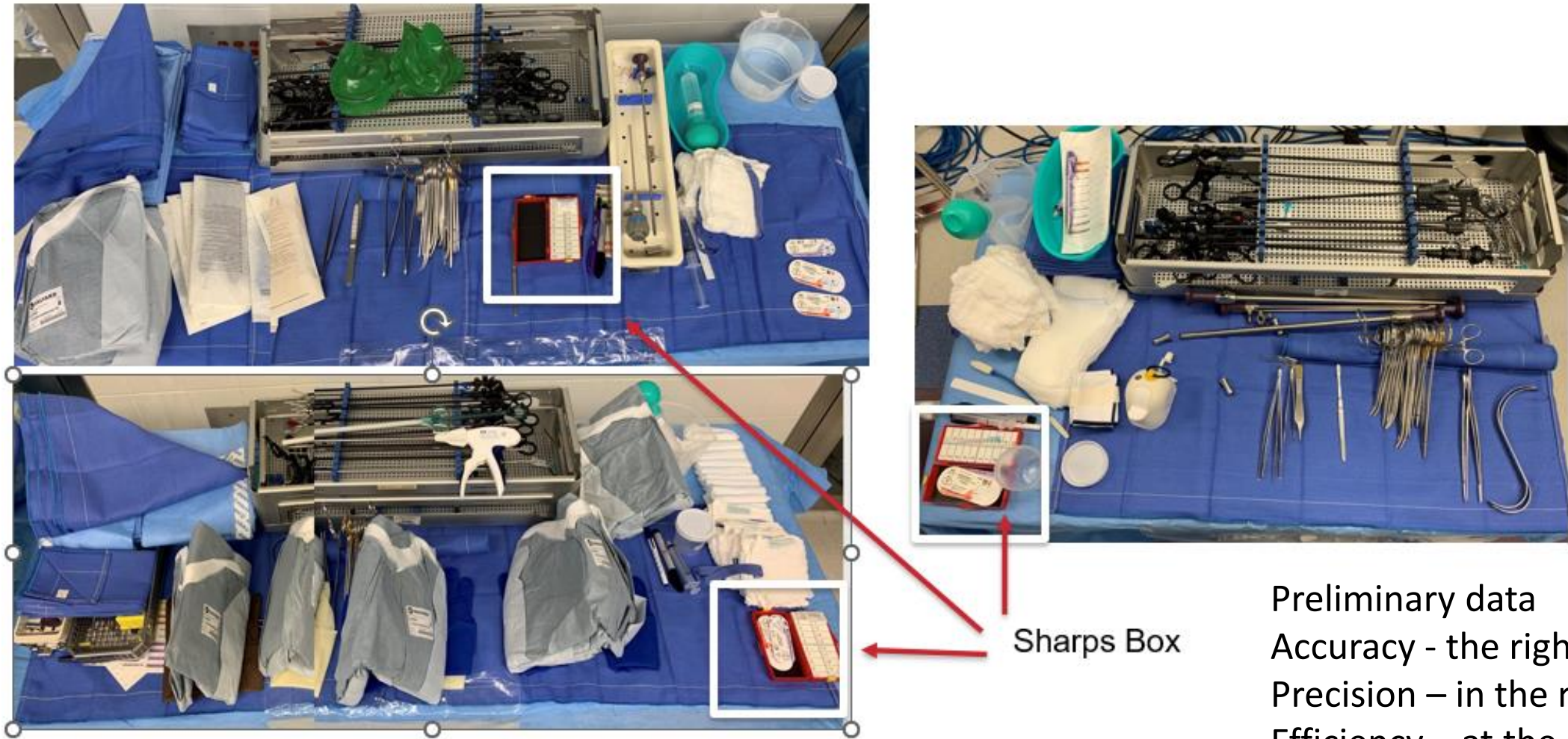
Laparoscopic Cholecystectomy



Started with laparoscopic cholecystectomy

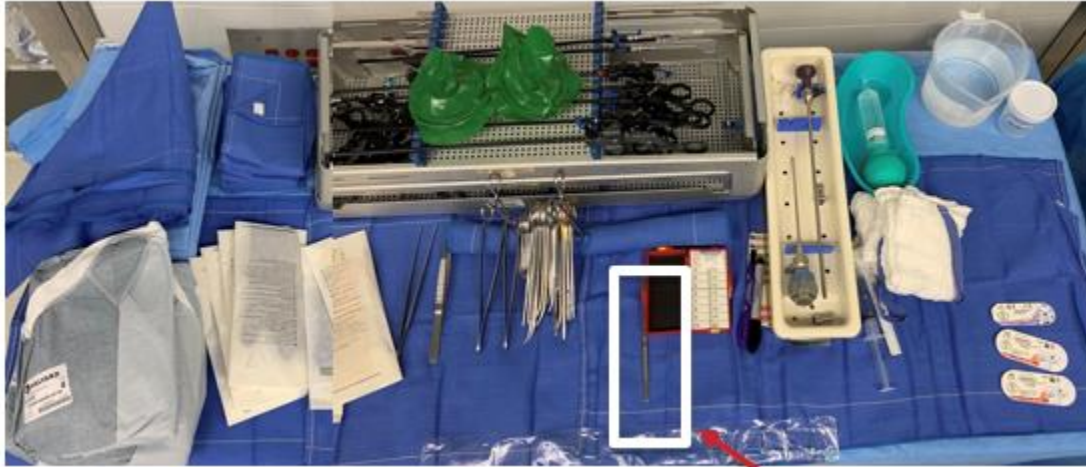
- Dark OR = Standardization is extremely important

Variability - Laparoscopic Cholecystectomy Preliminary Set Ups



Preliminary data
Accuracy - the right instrument
Precision – in the right place
Efficiency – at the right time

Variability - Laparoscopic Cholecystectomy Preliminary Set Ups



Scalpel

Dark Room
The scalpel – the knife
Different locations.

Creating a Standard

- Engaged front-line stakeholders – leadership did not dictate setup
- Developed a standard setup
- Utilized pictures for standard setup reference divided into four quadrants
- Developed and completed audits

Laparoscopic Cholecystectomy Standardization Audit

Upper Left Quadrant	Item Description	Present	Placement	Upper Right Quadrant	Item Description	Present	Placement
	Laparoscopic Instrument Box	o	o		0 Degree Scope	o	o
Lower Left Quadrant	Forceps	o	o	Lower Right Quadrant	Basin	o	o
	Laparoscopic Scissors	o	o		Sticker Labels	o	o
	Laparoscopic Graspers	o	o		Marking Pen	o	o
	Laparoscopic Maryland	o	o		Blue Towels	o	o
	DermaBond	o	o		Gloves	o	o
	Suture	o	o		Gowns	o	o
	Marking Pen	o	o		Specimen Cup	o	o
	Scalpel	o	o		Pitcher	o	o
	Open Instruments	o	o		Bulb Irrigation	o	o
	S Retractors	o	o		Scrub's Gown	o	o
	Trochars	o	o		Drapes	o	o
	Syringe	o	o		Draping Blue Towels	o	o
	Lap Pads	o	o				
Left Side Totals		/14	/14	Right Side Totals		/14	/14



Operations Standardized & Incentivization

Each service provided high volume low complexity cases to select their own case to standardize.

- Laparoscopic Cholecystectomy - General
- Open Inguinal Hernia – General
- Cataracts - Ophthalmology
- Cystoscopy - Urology
- Carpal Tunnel Release – Orthopedic
- Ulnar Nerve Decompression - Neurosurgery
- AV Fistula Formation - Vascular
- EGD with Dilation - Cardiothoracic
- Direct Laryngoscopy - ENT
- Toe Amputation - Podiatry

Won Shark Tank in 2021 - worked closely with the VHA Diffusion of Excellence team to move toward national diffusion.

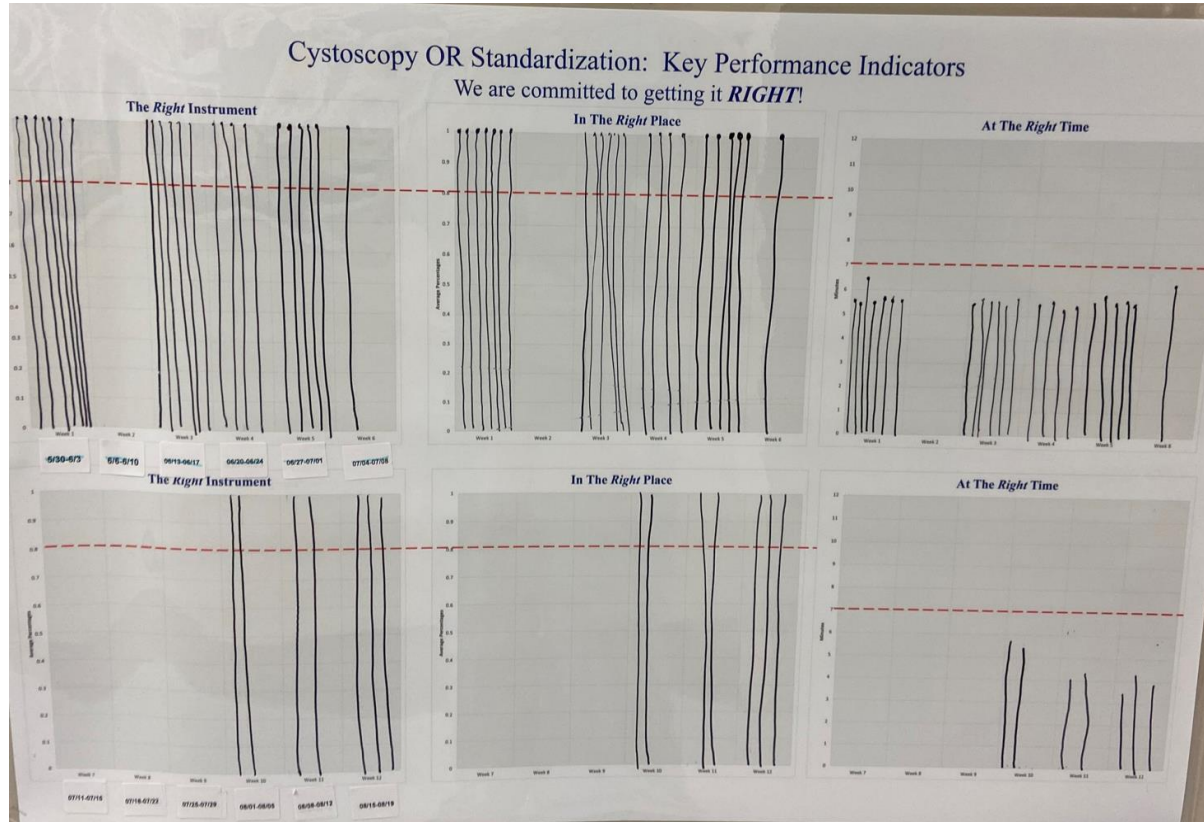
Critical staffing shortage was a hurdle. To increase the workload on a surgical team near burnout without an incentive would have failed. Incentivization ensured success.



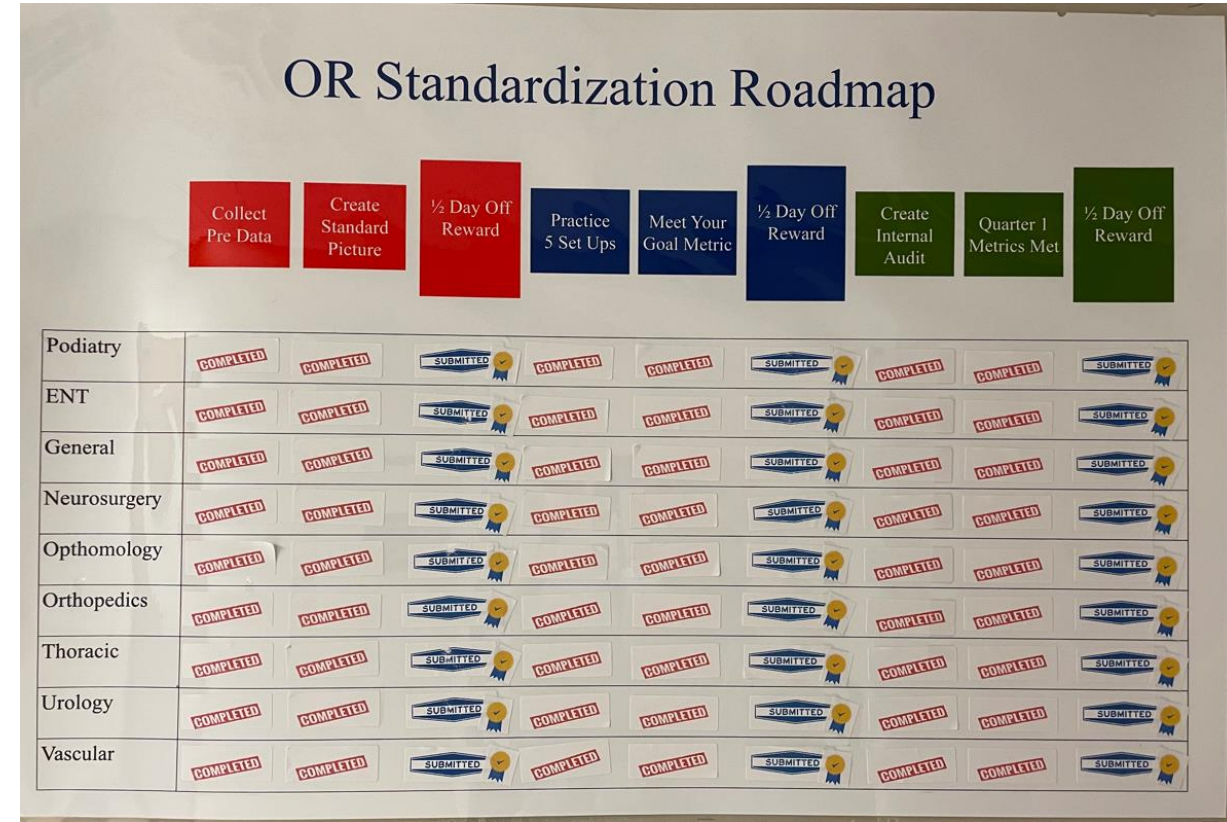
Staff selected incentive

- Polled staff
 - Valued their personal family time over a group event or monetary award
- Time Off Award

Measuring Success



Key Performance Indicator Boards



OR Roadmap

Incentive structure – all or none – leveraged teamwork

Measuring Efficiency

Safety events in surgery are infrequent, so measuring them is not easy. However, precision, accuracy, and efficiency became achievable metrics.

Service Line	Standard Setup	Efficiency Goal Time in seconds	Post Implementation Average Time in seconds	Time Savings Per Case in seconds	Time Savings Per Case in Min: Sec	Aug 2021- Aug 2022 Case Totals	Time Saved over 1 year in seconds	Time saved over 1 year in Hours: Minutes
Ophthalmology	Cataracts	540	361	179	2:59	570	102,030	28:20:00
General Surgery	Hernia Repair	720	337	383	6:23	101	38,682	10:45
General Surgery	Laparoscopic Cholecystectomy	1320	740	580	9:40	78	45,240	12:34
Vascular Surgery	AV Fistula	840	740	100	1:40	23	2,300	0:38
Podiatry	Toe Amputation	120	100	20	0:20	14	280	0:04
Urology	Cystoscopy	600	345	255	4:15	457	116,535	32:22:00
Ortho	Carpal Tunnel	600	427	173	2:53	32	5,536	1:32
ENT	Direct Laryngoscopy	240	136	104	1:44	48	4,992	1:23
Thoracic	EGD	120	99	21	0:21	17	357	0:09
Neuro	Carpal Tunnel	345	332	13	0:13	34	442	0:07
		5445	3617	1828		1,374	316,394	87 Hours & 53 Minutes
		Average Case Length 9:05	Average Case Length Post Implementation 6:02	Average Time Saved 183 sec	Average Time Savings 3:03 Min/Sec	Total Cases 1,374	Total Time Saved 316,394	Total Time Saved Over 1 Year 87 Hours & 53 Minutes

Cost Savings

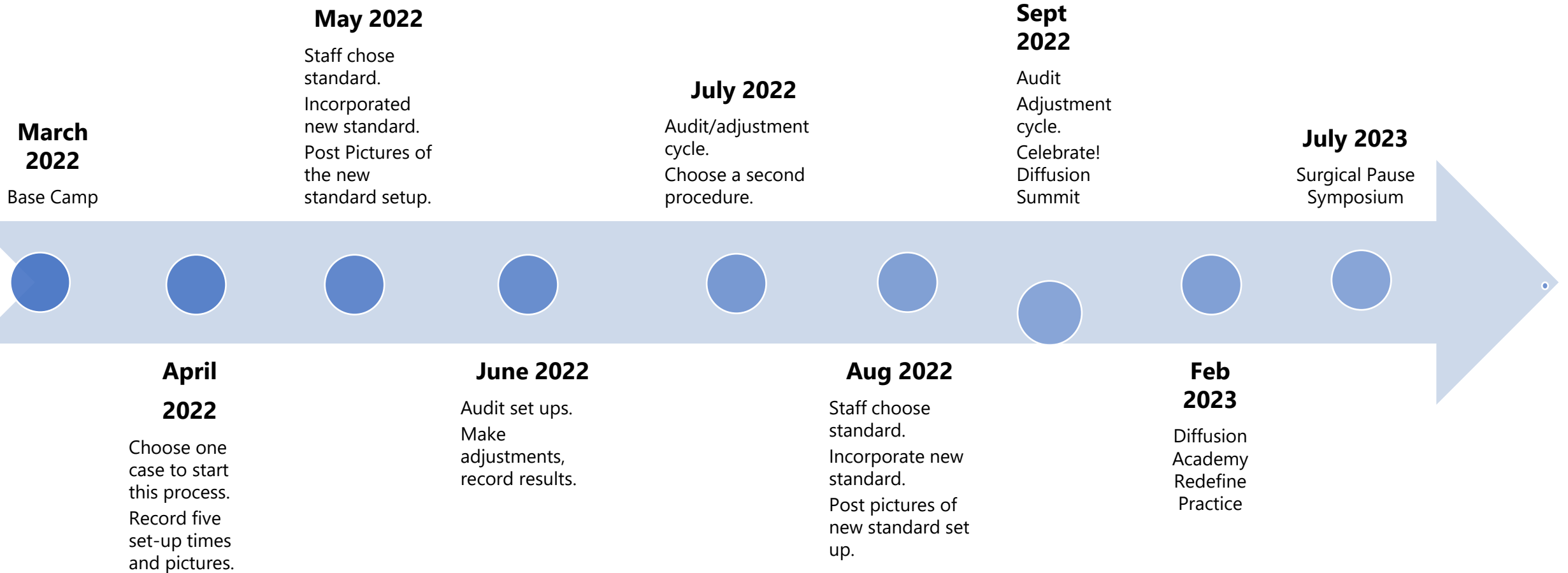
Service Line	Standard Setup	Efficiency Goal Time in seconds	Post Implementation Average Time in	Time Savings Per Case in	Time Savings Per Case in Min*	Aug 2021-Aug 2022 Case	Time Saved over 1 year in seconds	Time saved over 1 year in Hours: Minutes
Ophthalmology	Cataract							
General Surgery	Hernia							
General Surgery	Laparoscopic Cholecystectomy							
Vascular Surgery	AV Fistula							
Podiatry	Toe Surgery							
Urology	Cystoscopy							
Ortho	Carpal Tunnel							
ENT	Direct Laryngoscopy							
Thoracic	EGD							
Neuro	Cerebral Aneurysm							
		Average Case Length 9:05	Length Post Implementation 6:02	Time Saved 183 sec	Savings 3:03 Min/Sec	Total Cases 1,374	Total Time Saved 316,394	Year 87 Hours & 53 Minutes

\$60-a-minute cost for OR x 87 hours

\$316,800

Potential annual savings 3,100 cases saving average 3min 03 sec would equal 200 hours = \$720,000

Facilitated Replication Timeline



Partnered with the VHA Diffusion of Excellence team and provided education, tools, and resources to support the diffusion of our PI. Armed with the expertise of the diffusion of excellence team, we successfully rolled out the OR Standardization PI in Orlando, West Palm Beach, and Cincinnati



Lessons Learned

Staff Buy-In

Staff led standardization & an incentive structure

Allow staff to standardize the setup & ask staff how they would like to be rewarded

Auditing Cases

KPI Boards quickly identified inconsistencies in auditing

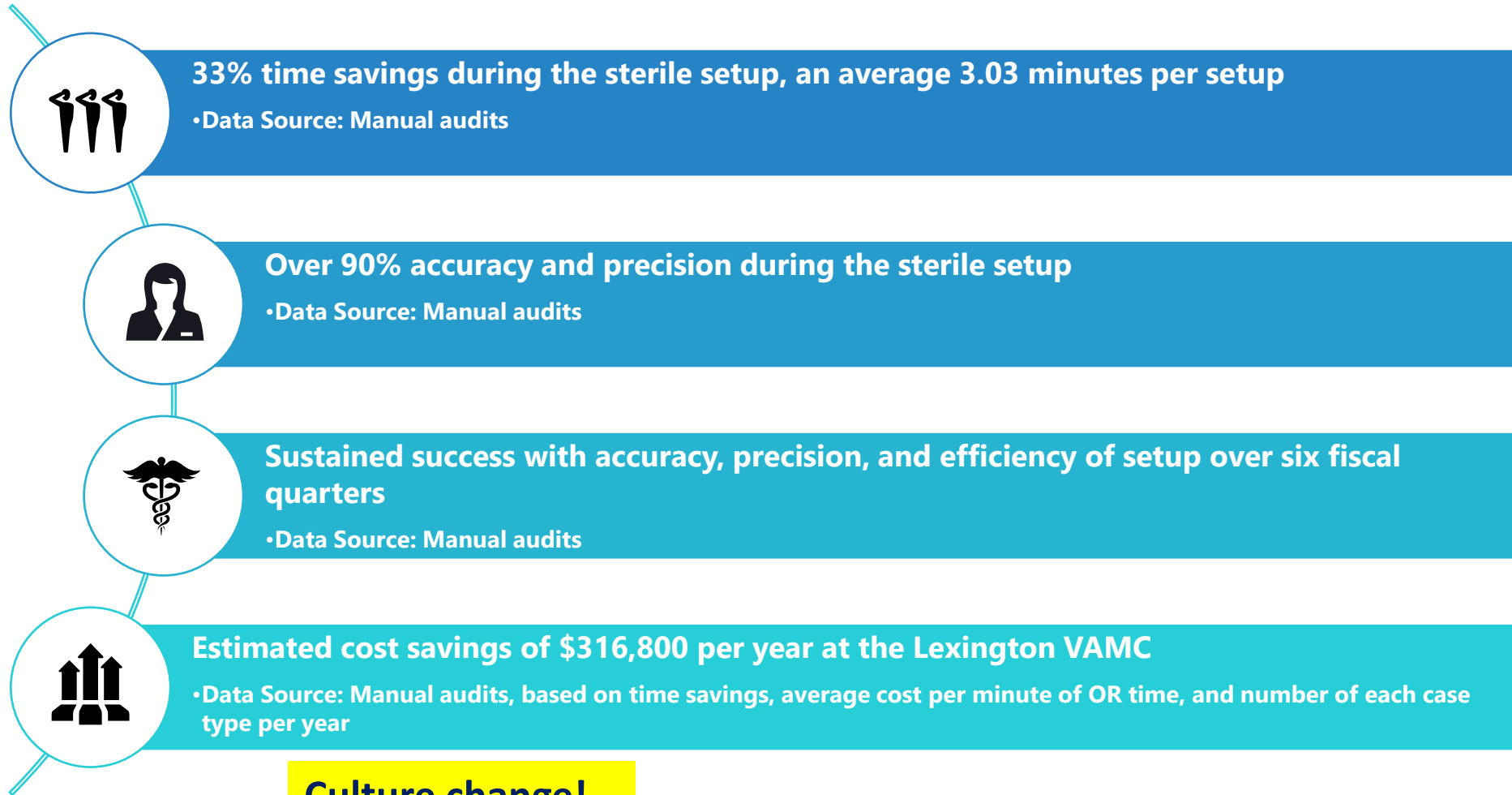
Identify & address the problem, i.e., missing audit sheets

Timing Setups

Reinforce to staff focus is on safety through precision and accuracy. Efficiency is not the focus.

Keep timing of the cases low key – efficiency metric is least important

Impact of Diffusion



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Surgical Pause Symposium



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium

VA HEROES

(Hazard-avoiding Enhanced Recovery & Opioid/Environmental Stewardship)

A Response to the Opioid Epidemic by minimizing drug-induced euphoria in VA surgical patients

Brian A. Williams, MD, MBA - Presenter

Daniel E. Hall, MD, MS, MDiv, FACS – National Diffusion Fellow

VISN 4: VA Pittsburgh



Intersection of RAI/Frailty/Surgical Pause and Opioids/Pain

JOURNAL OF PAIN & PALLIATIVE CARE PHARMACOTHERAPY
2019, VOL. 33, NOS. 3-4, 82-97
<https://doi.org/10.1080/15360288.2019.1668902>



ARTICLE

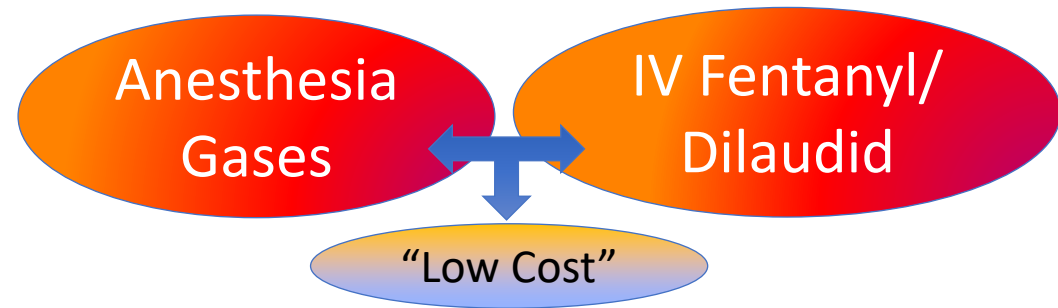


Opioid-related respiratory and gastrointestinal adverse events in patients with acute postoperative pain: prevalence, predictors, and burden

Gary M. Oderda, Anthony J. Senagore, Kellie Morland, Sheikh Usman Iqbal, Marla Kugel, Sizhu Liu and Ashraf S. Habib

- 600,000 hospital stays. Opioid-induced respiratory depression (OIRD) burden, postoperative nausea/vomiting (PONV) burden, and Length of Stay / cost implications
- One or more opioid (**fentanyl**, **hydromorphone**) doses in-hospital→
 - OIRD 3-17%: 3-9 days of LOS increment; \$5k-\$20k cost increment
 - PONV 44-72%: 2-5 days of LOS increment; \$2k-\$9k cost increment

Problem



Problem

Potent
Greenhouse Gas:

- 0.1% of
CO₂-equivalent
total global warming
emissions

Anesthesia
Gases

IV Fentanyl/
Dilaudid

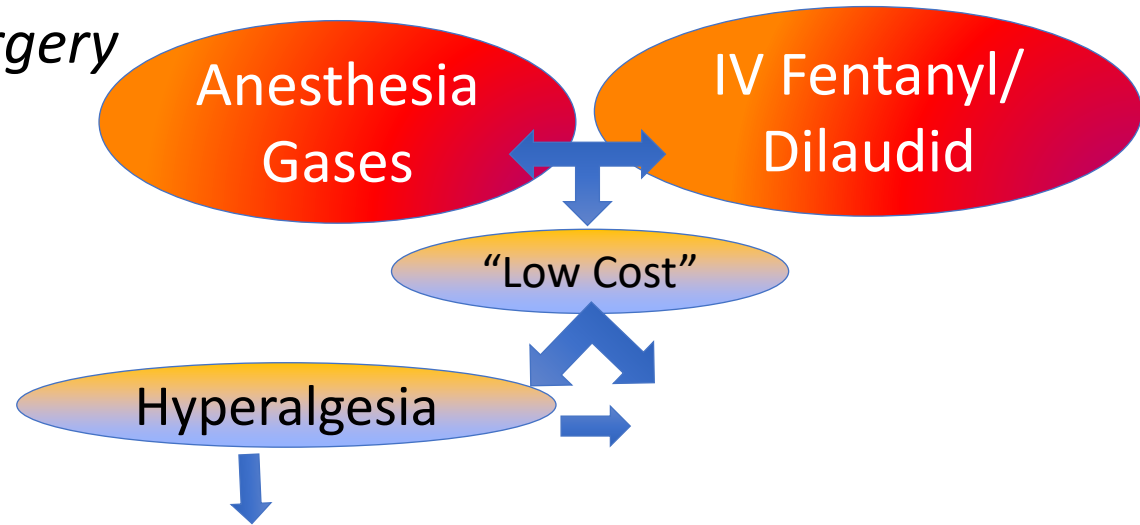
“Low Cost”

Problem



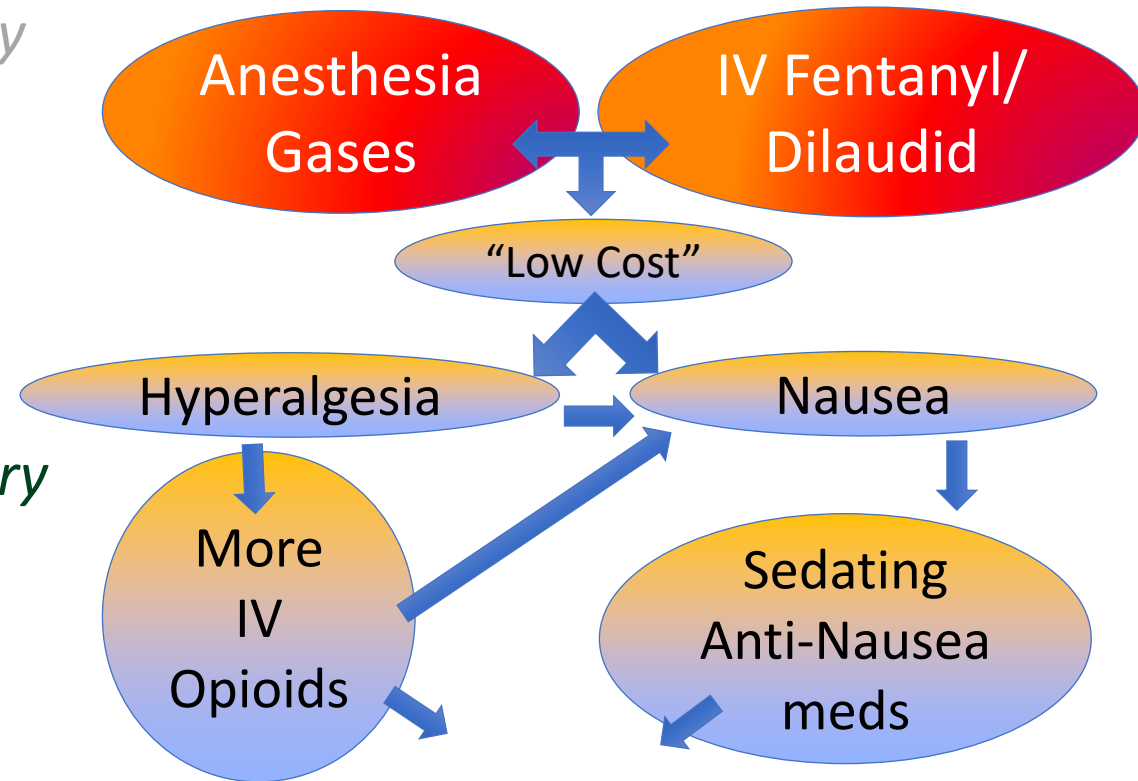
Problem

- Enhanced recovery after surgery (ERAS) *commonly* uses drugs known to increase pain sensitivity



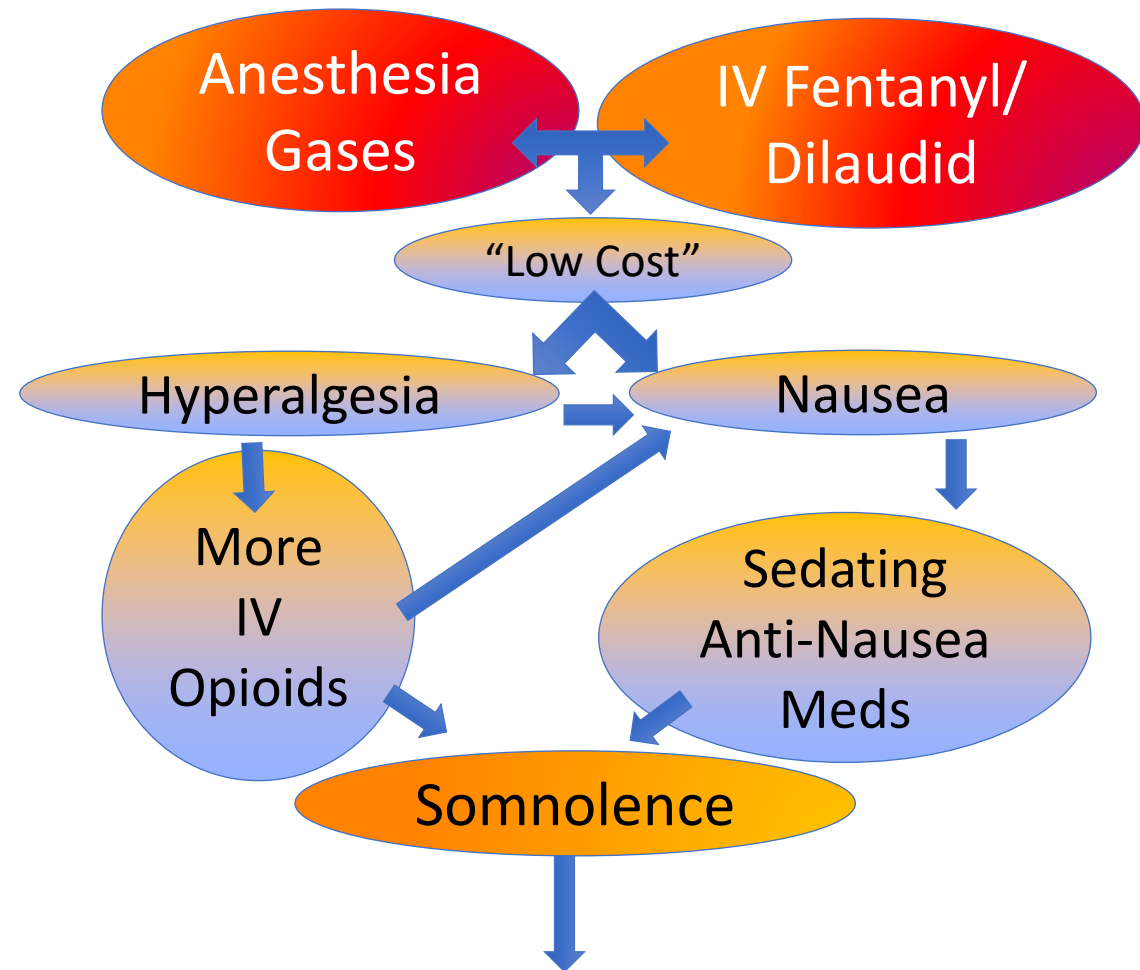
Problem

- *Enhanced recovery after surgery (ERAS) commonly uses drugs known to increase pain sensitivity*
- *Traditional Anesthesia Vicious Cycle adds to further opioid consumption after surgery*



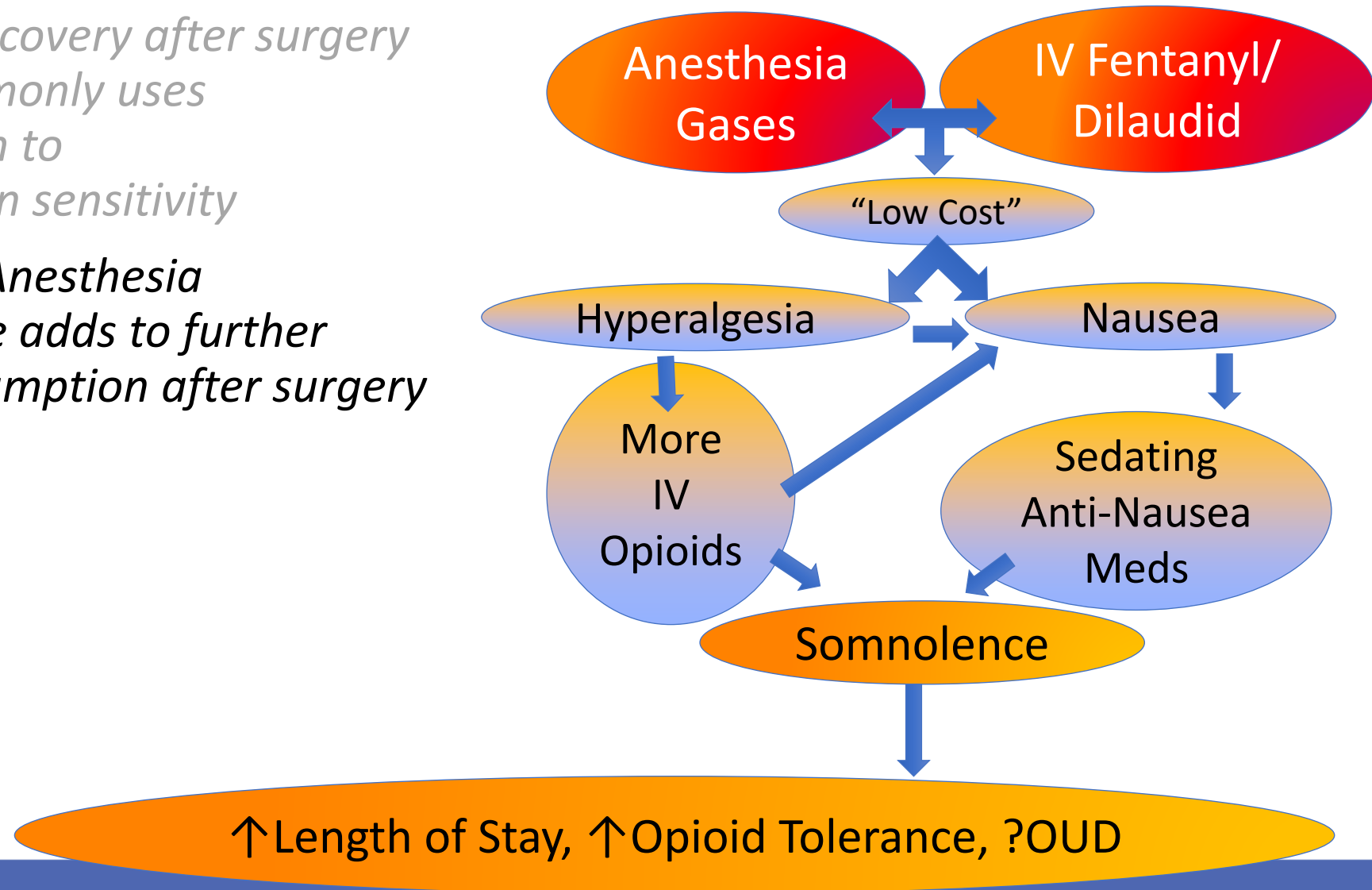
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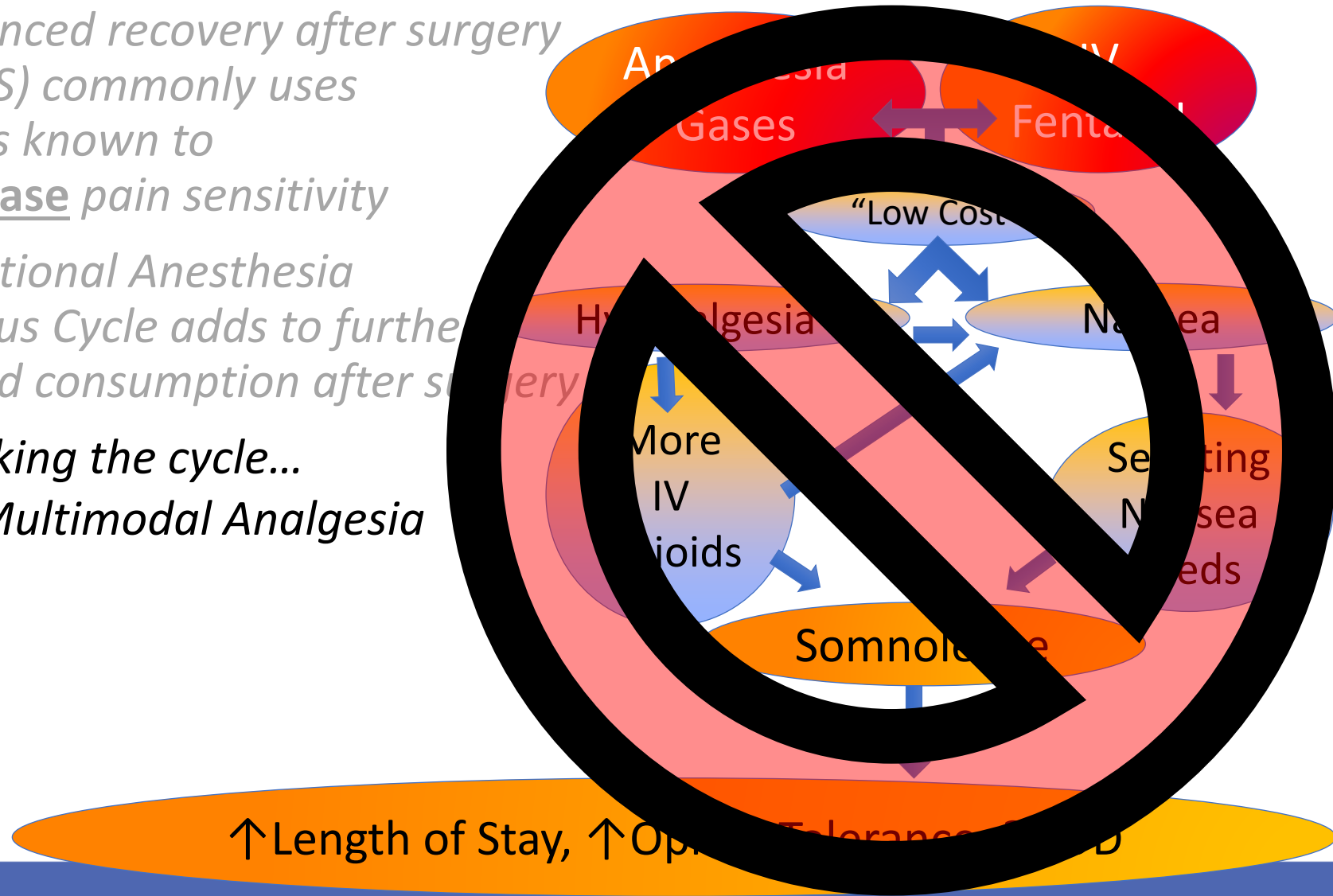
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- *Traditional Anesthesia Vicious Cycle adds to further opioid consumption after surgery*



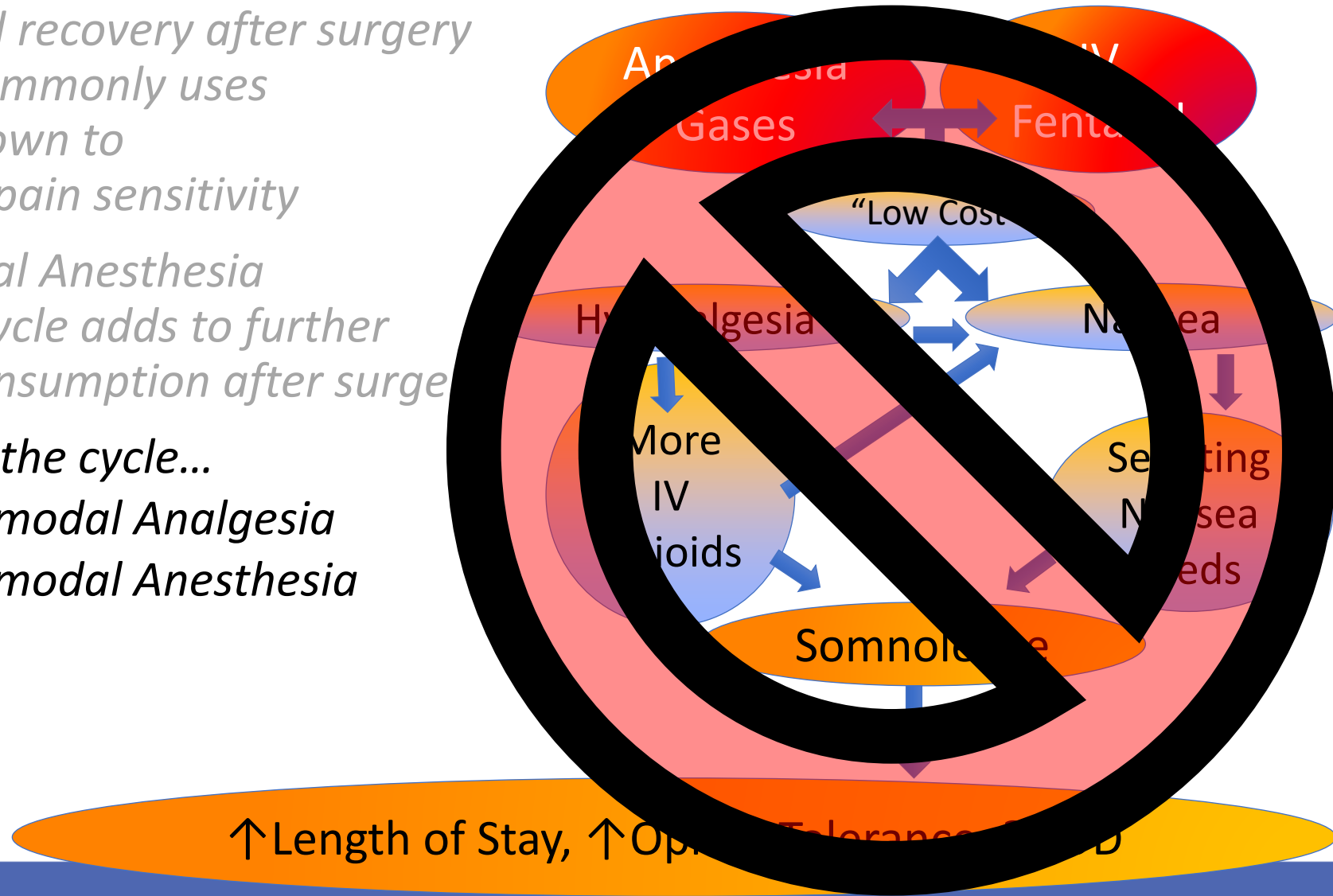
Problem

- Enhanced recovery after surgery (ERAS) commonly uses drugs known to increase pain sensitivity
- Traditional Anesthesia Vicious Cycle adds to further opioid consumption after surgery
- Breaking the cycle...
 - Multimodal Analgesia



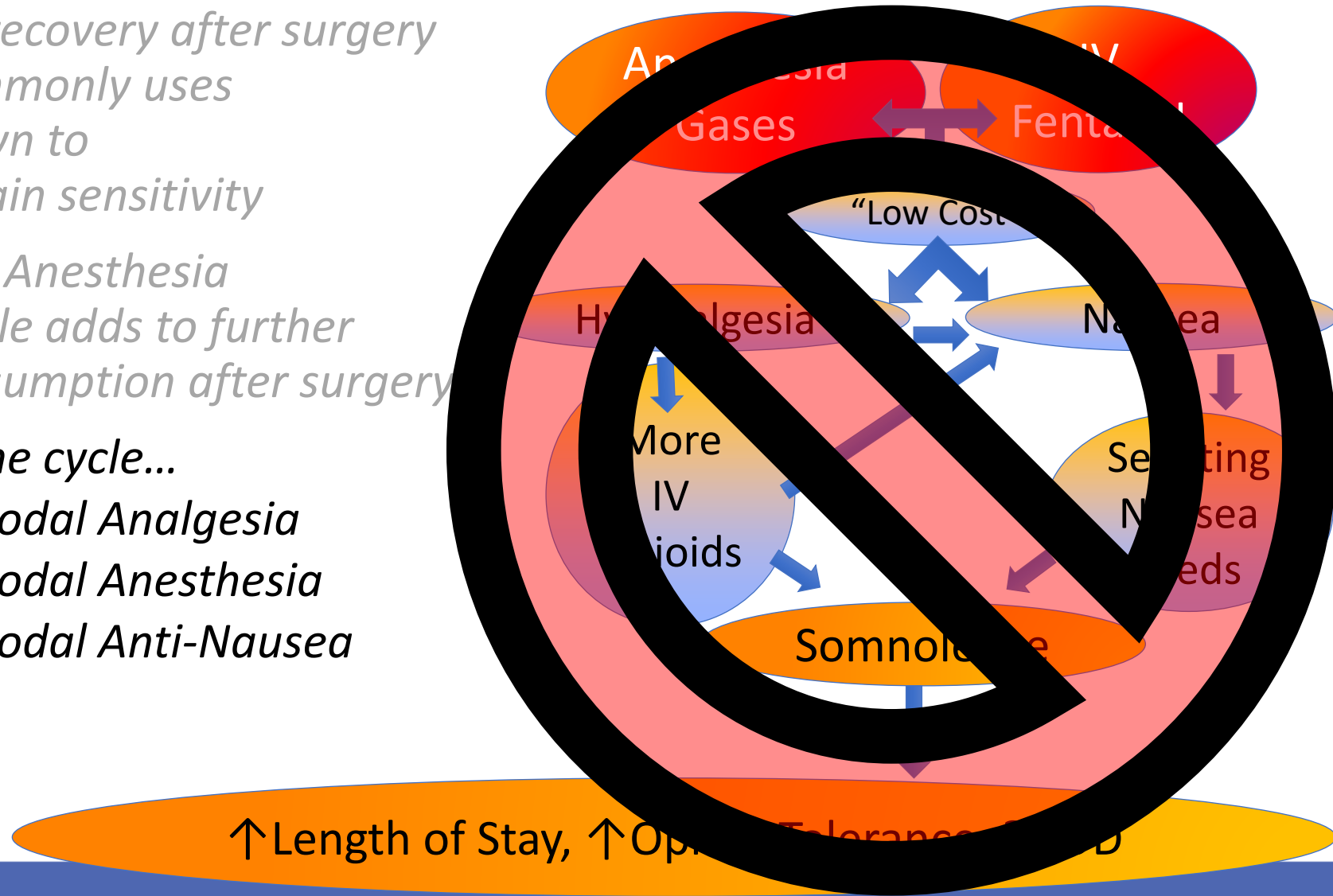
Problem

- *Enhanced recovery after surgery (ERAS) commonly uses drugs known to increase pain sensitivity*
- *Traditional Anesthesia Vicious Cycle adds to further opioid consumption after surgery*
- *Breaking the cycle...*
 - *Multimodal Analgesia*
 - *Multimodal Anesthesia*




Problem

- Enhanced recovery after surgery (ERAS) commonly uses drugs known to increase pain sensitivity
- Traditional Anesthesia Vicious Cycle adds to further opioid consumption after surgery
- Breaking the cycle...
 - Multimodal Analgesia
 - Multimodal Anesthesia
 - Multimodal Anti-Nausea



CORRESPONDENCE

Aim for zero: prevention of postoperative nausea and vomiting using an off-patent five-drug multimodal approach

Brian A. Williams^{1,3,*}, Jennifer M. Holder-Murray^{1,2,3}, John F. Nettrour^{3,4},
James W. Ibinson^{1,3} , Joseph S. DeRenzo¹, Chelsee Dalessandro³,
Michael L. Kentor¹ and Andrew Herlich¹

¹Department of Anesthesiology and Perioperative Medicine, University of Pittsburgh, Pittsburgh, PA, USA, ²Department of Surgery, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA, ³Veterans Affairs Pittsburgh Healthcare System, Pittsburgh, PA, USA and ⁴Department of Orthopaedic Surgery, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

*Corresponding author. E-mails: williamsba@anes.upmc.edu, brian.williams6@va.gov

Keywords: aprepitant; dexamethasone; diphenhydramine; opioid; pain management; palonosetron; perphenazine; postoperative complications; postoperative nausea and vomiting; treatment outcome

Problem

- *Enhanced recovery after surgery (ERAS) commonly uses drugs known to increase pain sensitivity*
- *Traditional Anesthesia Vicious Cycle adds to further opioid consumption after surgery*
- *Breaking the cycle...*
 - *Multimodal Analgesia*
 - *Multimodal Anesthesia*
 - *Multimodal Anti-Nausea*
 - *Environmental Stewardship*



↑Length of Stay, ↑Opioid consumption, ↑POUD

Opportunity 1a: Environmental Stewardship

Change hospital culture from "gas"
to "Propofol Total Intravenous Anesthesia" (TIVA)

- Service Line VP, Chief of Staff, and/or Hospital Director appoints/authorizes "Senior Steward"
- Mechanism to educate and reinforce desired behavior
 - IV non-opioid TIVA adjuvants
 - Expectations for routine IV vasopressors.

Opportunity 1b: Surgical Opioid Stewardship

Change hospital culture from repeated “abuse liability opioids”
to front-loaded single-dose “opioid-sparing opioid”

- In-hospital conversion
from “hyperalgesic”
to “anti-hyperalgesics”.

Multimodal analgesia as “Plan A”

- Guidance by appointed Senior Physician “Steward” or other appointed “SuperUsers”
- Senior Steward authorized to direct Pain/Analgesia plan first; then Anesthesia providers anesthetize, and Surgeon operates.
- Education
- Incentives as allowable

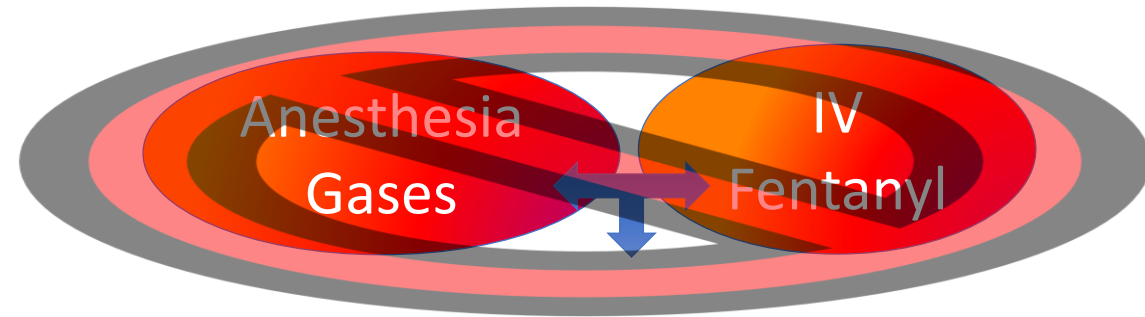
Problem to Solve

- *Enhanced recovery after surgery (ERAS) commonly uses drugs known to increase pain sensitivity*
- *Traditional Anesthesia Vicious Cycle adds to further opioid consumption after surgery*
- *Breaking the cycle...*
 - *Multimodal Analgesia*
 - *Multimodal Anesthesia*
 - *Multimodal Anti-Nausea*
 - *Environmental Stewardship*



Solution

- “Substitution Plan”
(We’ll be replacing anesthesia gases and short-acting opioids with...)
- Leadership plan
- Implementation plan
 - Multimodal Analgesia
 - Multimodal Anesthesia
 - Multimodal Anti-Nausea
 - Environmental Stewardship



- Faster ambulation
- Less ileus
- Lower long-term costs
- Less OUD originating from surgery at the VA

Brian A. Williams, MD, MBA
Professor – University of Pittsburgh
Director of Acute Pain – VA Pittsburgh

Brian.williams6@va.gov

Available for detailed remote consultation





Surgical Pause Symposium

Virtual Reality for Post Surgical
Pain Distraction

Amanda Graves, MSN, RN
Inpatient Surgical Nurse Manager
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What is Virtual Reality (VR)?

- Virtual Reality is 3D computer generated environment that an individual interacts with in a seemingly real way.
- Hardware in this instance will include just the headset itself – no controller needed
- Software varies depending on intended use



How we started

- Enhanced recovery after surgery (ERAS) is a multimodal approach to hastening recovery and improving outcomes after surgery. With respect to pain control around the time of surgery, a multimodal approach results in lower complication rates, decreased length of stay, a reduction in opioid-related adverse events, and a decrease in mortality (JAMA Intern Med. 2016 sept 1; 176(9): 1286-1293).



Problems

- Pain
- Stress
- Anxiety
- Boredom

Outcomes

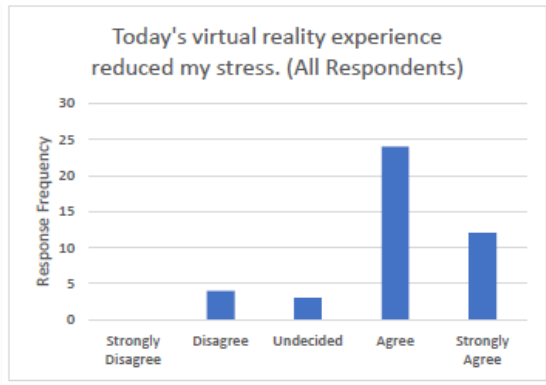
- Improved pain mgmt.
- Decreased opioid usage
- Increased PT participation
- Improved patient outcomes and patient experience



"It takes your mind off your time in the hospital, and it takes your mind off your pain."

Army Veteran, Total Knee Arthroscopy (TKA), 07/2018

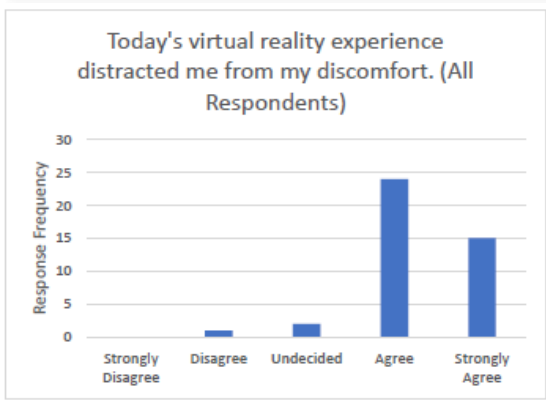
Pilot Study Results



84% of users felt a reduction in stress during and after session



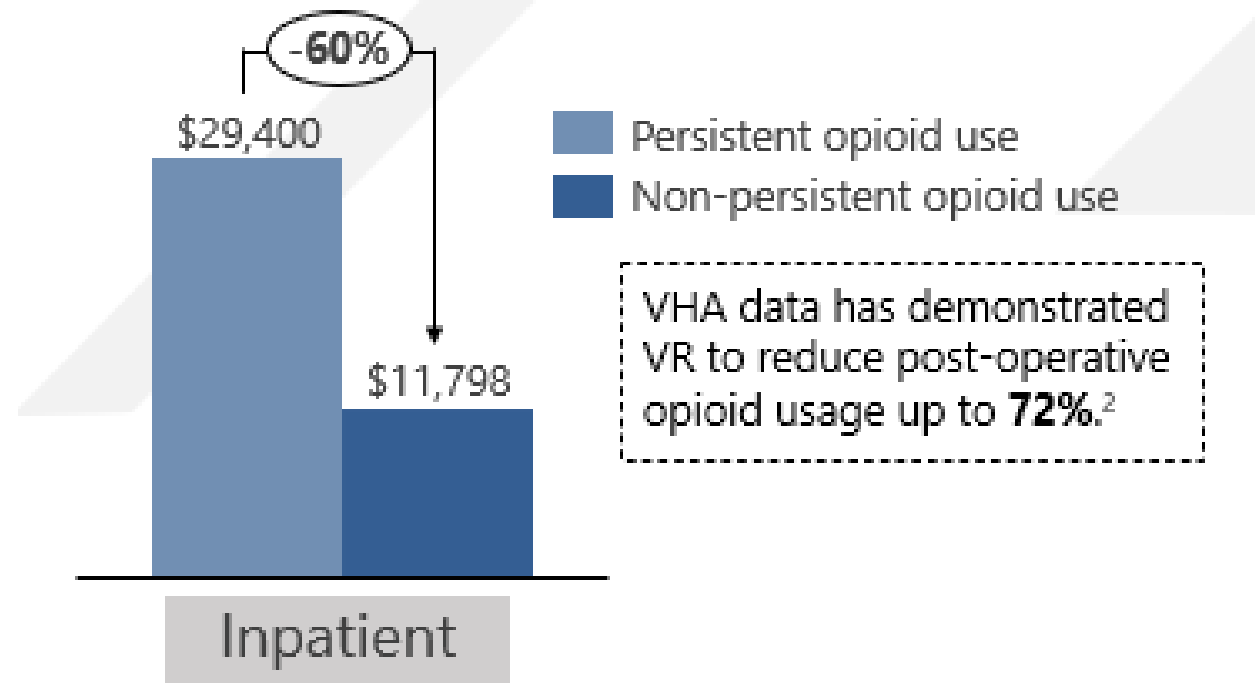
93% of users stated VR distracted them from their discomfort/pain



97% of users would recommend VR to their fellow veterans

Decrease in Opioid Use Post-Operative

12-month predictive post-operative healthcare utilization costs¹



1. Brummett et al., 2021. 2. Rawlins, Dans., 2020

Current Use of VR

- **Initial Project**

- Program began as pilot in July 2018 on 5West with Post-op patients
- Adjunct therapy of the Enhanced Recovery After Surgery (ERAS) Indications for Use:
- Positive distraction to aid with management of:
 - Acute Pain
 - Chronic Pain
 - Stress/Anxiety
 - Behavioral Concerns

- **Patient areas:**

- | | |
|----------------------|-----------------------|
| ▪ Inpatient Surgical | ▪ Valor Hospice |
| ▪ Mental Health | ▪ Outpatient Oncology |
| ▪ Med/Surg units | ▪ Infusion Clinic |
| ▪ MICU/SICU | ▪ SARRTP |
| ▪ CLC-1 | ▪ PM&RS |
| ▪ CLC-2 | ▪ VIPM |

600 Sessions Completed

358 Unique Patients

Demographics

- 93.5% Male
- Average Age: 64.4 yo

% Indications for Use

- Pain – 50% (n = 262)
- Anxiety – 40% (n= 209)
- Behaviors – 36% (n= 188)
- Boredom – 29% (n = 151)
- Stress/Relaxation – 26% (n= 136)

Data collected 07/18/2018- 02/25/2023

	Total Number of Sessions = 600 **		N=	All patient areas Inpatient Wards Warrior Recovery Unit (MH) Community Living Center Hospice Unit Oncology Infusion Imaging/IR SARRTP PM&RS Operating Room Post-Anesthesia Care Unit Employee-facing: Employee Wellness Rooms Empathy Training
Indications for use	Pain	50%	262	
	Anxiety	40%	209	
	Relaxation	26%	136	
	Boredom	29%	151	
	Behaviors	36%	188	
VR for Pain	Reduction in pain of 1+ pts (DVPRS)	67%	262	
	Average % Decrease in Pain Intensity	30%	262	
	1-2 point decrease	73%	176	
	3+ point decrease	27%	176	
	Acute pain decrease	64%	176	
	Chronic Pain Decrease	68%	176	
VR for Anxiety	Decrease in anxiety level (STAI-5)	84%	209	
VR for Relaxation	Appeared or States "Rested/Relaxed"	90%	136	
VR for Boredom	Dissipation of Boredom	95%	151	
VR for Behavioral Concerns*	Overall improved behaviors	89%	188	
*can also include increase in positive behaviors	Increased Calm/Cooperation	91%	160	
	Decreased agitation, restlessness and/or tearful/sad behaviors	83%	29	

** 74 sessions completed prior to CPRS documentation template build. Included in total but no other percentages.



VR Experience

- What are some environments Veteran *see/hear* during a VR Session?
 - Guided Meditation
 - Interactive activities
 - World Travel experience
 - Underwater experience
 - Beach Experience
 - Nature Experience
 - Specifically chosen music for brainwave training



General exclusion criteria for all VR Programs:

- Individuals should NOT use this virtual reality system if they have:
 - History of seizures or epilepsy
 - Head, neck, facial injury and/or surgery in the last 6 weeks
 - Stroke and/or head trauma in the last 6 weeks
 - Implanted medical device(s) potentially subject to electromagnetic interference
 - Severe frailty
 - Active psychosis and/or delirium
 - Active nausea or dizziness

Lessons Learned & Current Needs

Clinical Implementation



Engaged Champions



Clinician training



**Standard Operating
Procedures +
Infection Control**



**Standardized
Documentation and
Metrics**



Wi-Fi Woes



Avoid Inequities



Security Needs



Collaboration



**Build a Business
Case + New Care
Model**

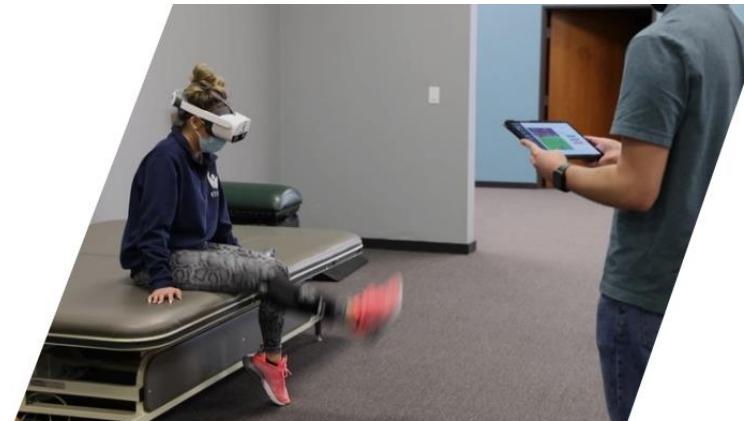
What's Next?

Completion of 4 VR Pilot programs

- PTSD/Anxiety
- Chronic Pain
- Mental Health/ SI Prevention
- Neuro Rehab/PMRS

Lower Extremity Function

- Hip, Knee, & Ankle Function
- Gross Muscle Strengthening
- Bike, Nu-Step, & Standing Frame Compatible
- Weight Bearing & Weight Shifting



National Recognition

4/8/23, 10:34 AM

Confronting Your Fears in Virtual Reality Therapy - WSJ



A veteran at a VA medical center uses immersive technology during a visit. The technology helps VA patients with physical therapy, post-traumatic stress disorder and social isolation, among other conditions.

PHOTO: CREDIT: RAHUL PATEL

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Surgical Pause Symposium



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Surgical Pause Symposium

Preventing Post-Operative Readmissions with Surgical Safety Net

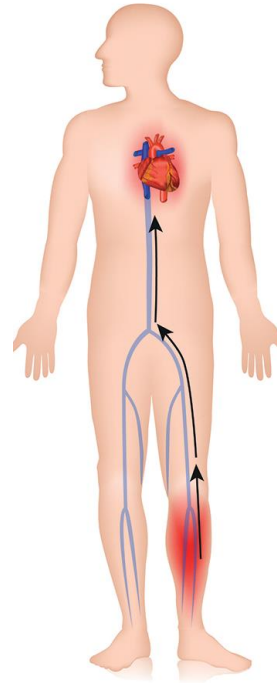
Visala Muluk MD

Section Chief, IMPACT clinic, VA Pittsburgh

Director of IMPACT, VISN4

Associate professor of medicine, University of Pittsburgh





80-yo patient
s/p hip surgery

Demoralizing to
stake holders

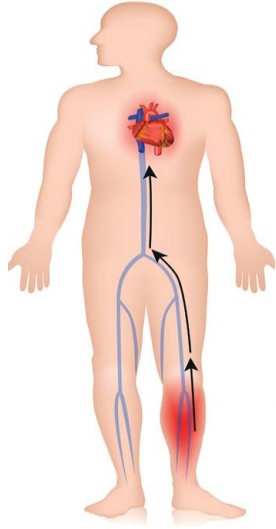
Financial strain

**Postoperative
Readmissions**

**Affects Hospital
standing**

Patient
dissatisfier

Inspiration behind the surgical safety net



80-yo patient.
Preventable
Pulmonary
Embolus
**COMMUNICATION
FAILURE!!**

VAPHS post-op
readmission rates FY 2020



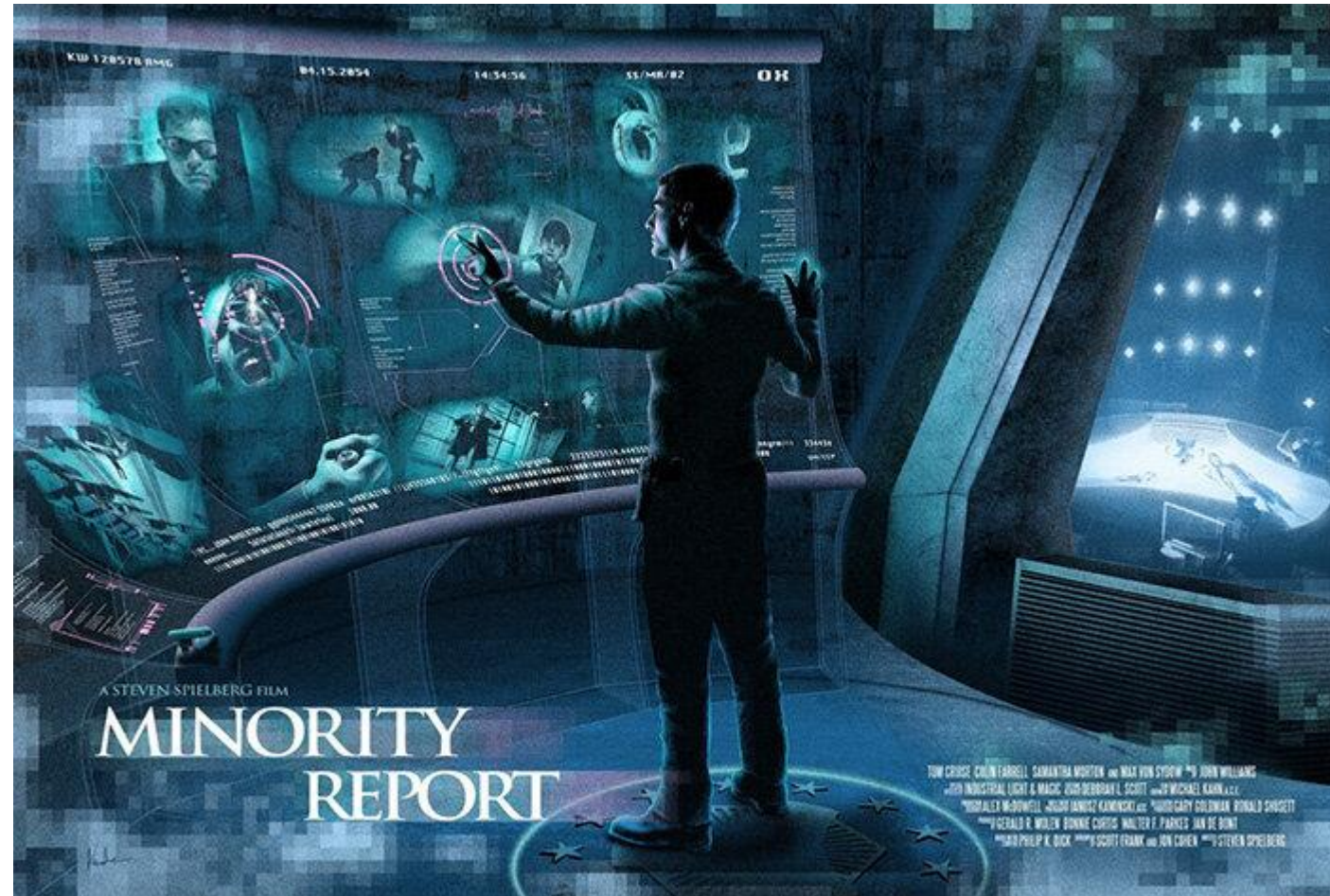
4th quintile by SAIL



IMPACT was already a
JCAHO Best Practice
Initiative

Plan: Shifting from reaction to prevention

- **Predictive Model** to determine patients at risk for re-admission
- **Nurse Navigator** to own the task of preventing re-admission
- **24/7 virtual coverage** to address post discharge issues



30-day readmission predictors based on chart review of past readmissions

Frailty based on
RAI score

Current Smoker or
quit within 3
months of surgery
date

AUDIT score 4 or
higher with
evidence of
dependence

Living alone
without social
support system

Diabetes
HGBA1c 8 or higher

High VTE risk with
Caprini score 8 or
higher

Length of surgery 4
hours or greater

Cirrhosis with
MELD score 15 or
higher



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Multi-disciplinary virtual team conference



Key elements



Patient & Staff Experience

“Because of my experience with the Impact Clinic, I would recommend this hospital to anyone.”

**Richard Marshall,
Veteran**

“This should serve as a model for all surgical care across the VA nationally.”

**VAPHS Cardiothoracic
Surgeon**

“The virtual visit enabled the patient to show his living conditions. That helped us make his home safe for post-op recovery.”

VAPHS Physical Therapist

“The team has been tremendously helpful, and it is a pleasure to work with them”

VAPHS Social Worker



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Surgical Pause Symposium



Outcomes FY 2020 to FY 2022

SAIL re-
admission
quintile

4th



1st

Surgical
NSO Re-
admission
rate

25%
drop

Next hill to climb

- Create IMPACT hospitalist program
- Goals
 - Improve discharge process
 - Optimization for transferred patients



Surgical Safety Net Team



Contact Information

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Thursday June 22, 2023
VHA SimLEARN National Simulation Center



Surgical Pause Symposium

Optimizing the Quality of Care in Lung Cancer

Presented by:

Mayank R. Patel MD

ACOS Surgical Service

VA Saint Louis Health Care System



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Surgical Pause Symposium

Assistant Clinical Professor of Surgery
Washington University School of Medicine
Division of Cardiothoracic Surgery



Disclosures

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Optimizing the Quality of Care in Lung Cancer

Lung cancer remains the leading cause of cancer related mortality in the United States

	Common Types of Cancer	Estimated New Cases 2023	Estimated Deaths 2023
1.	Breast Cancer (Female)	297,790	43,170
2.	Prostate Cancer	288,300	34,700
3.	Lung and Bronchus Cancer	238,340	127,070
4.	Colorectal Cancer	153,020	52,550

- Curative intent surgical resection is the preferred treatment for functionally fit patients diagnosed with *early-stage non-small cell lung cancer (NSCLC)*
- Despite “curative intent” , resection outcomes remain suboptimal :

Follow up	Overall Survival (OS)	Cancer Recurrence
At 5years	60-80%	20-30%

What can we do to improve the proportion of patients with early-stage lung cancer to have the best possible outcomes?

Paradigm Shift for Quality



VA Surgical Quality Improvement
Program (VASQIP)



National Surgical
Quality Improvement
Program (NSQIP)

30-day morbidity and mortality (O/E)

Complications and mortality occur infrequently in the first 30 days after operations for early-stage lung cancer

Focus on such metrics may stimulate us to pursue surgical approaches that miss the more important goal of achieving long term survival via a curative intent lung cancer resection

EXAMPLES

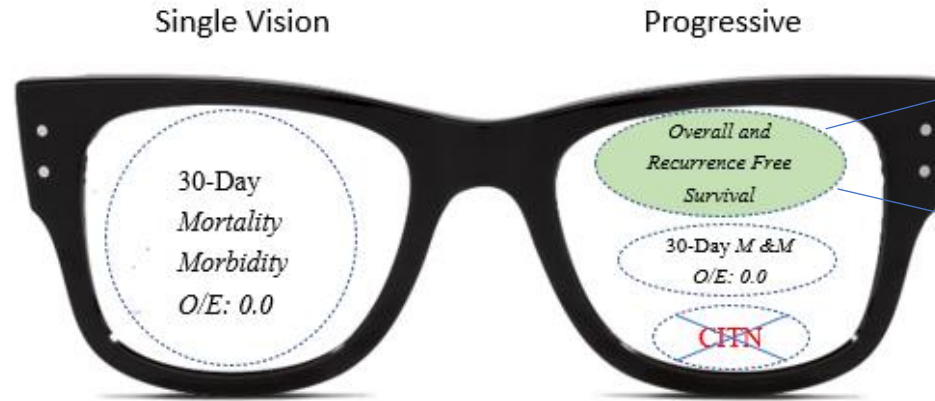
- Sublobar resections are associated with superior short-term morbidity / mortality but inferior overall and disease-free survival
- Intraoperative lymph node sampling—a technically challenging and time-consuming process—has no effect on short-term outcomes but is associated with significantly worse disease-free survival when performed inadequately

- ❑ In a worst-case scenario patients could be shunted to perceived high-quality surgical centers
 - sub-lobar resections with inadequate lymph node sampling and dismal long-term oncologic outcomes

We must shift the paradigm to avoid such myopic views of surgical quality.



Flexible Dynamic Approach



Increasing studies are citing the benefits of definitive surgical management of early-stage lung cancer

- ✓ **Preoccupation with failure** – focus on overall survival and decreased recurrence
- ✓ **Reluctance to simplify** – perform a meticulous operation
- ✓ **Commitment to resilience**- persevere to provide the best treatment possible

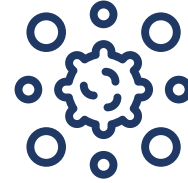
- ✓ **Deference to expertise** - follow a consistent framework of evidence based surgical care
- ✓ **Sensitivity to Operations**- working within and shaping our systems for success

Surgical Quality Metrics - NSCLC



Timely Surgery

Defined as surgery within 12 weeks of radiographic diagnosis of NSCLC



Adequate Nodal Sampling

Defined as sampling at least 10 lymph nodes according to the American College of Surgeons Commission on Cancer (CoC) standards during study period



Anatomic Resection

Defined as receipt of anatomic resection (via lobectomy or segmentectomy)



Negative Margin

Defined as achieving a RO (negative) surgical margin



Minimally Invasive Approach

Defined as resection via video assisted thoroscopic (VATs) or Robotic Approach (via lobectomy or segmentectomy)

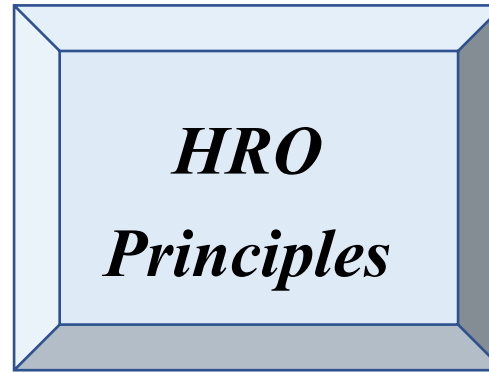
JAMA Surg. 2023;158(3):293-301. doi:[10.1001/jamasurg.2022.6826](https://doi.org/10.1001/jamasurg.2022.6826)
Published online January 18, 2023.

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Mission



+



+



Washington University
Thoracic Surgery



VA STL HCS
Research

Develop a practical surgical quality score among patients with clinical stage I non-small cell lung cancer (NSCLC) receiving definitive surgical treatment

Methods

Data

- VHA Corporate Data Warehouse (CDW)
- 9628 Veterans with early-stage NSCLC receiving surgery (2006-2016)



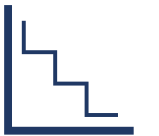
QMs

- Defined by contemporary guidelines + prior work
- Timely surgery, anatomic resection, minimally invasive approach, adequate nodal sampling, negative margin



Analysis

- Association between QMs and OS
- Develop VA Lung Cancer Operative quality (VALCAN-O) score
- Validated in 107,674 patients from National Cancer Database (NCDB, 2010-2016)



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Development of the Score

Variable ^a	aHR, 95% CI	β	p-value	Points
Delayed surgery				
>12 weeks	[1 ref]	-	-	0
≤12 weeks	0.895 (0.845-0.948)	-0.11	<0.001	1
Surgical approach				
Open	[1 ref]	-	-	0
Minimally invasive	0.907 (0.855-0.962)	-0.10	0.001	1
Extent of resection				
Wedge	[1 ref]	-	-	0
Lobectomy	0.837 (0.776-0.903)	-0.18	<0.001	2
Segmentectomy	0.835 (0.729-0.956)	-0.18	0.009	2
Pneumonectomy ^b	1.255 (1.012-1.555)	0.23	0.04	0
Nodal sampling adequacy				
0 LN	[1 ref]	-	-	0
1-4 LN	0.887 (0.802-0.980)	-0.12	0.02	1
5-9 LN	0.829 (0.747-0.920)	-0.19	<0.001	2
≥10 LN	0.822 (0.740-0.914)	-0.20	<0.001	2
Surgical margin				
R1+	[1 ref]	-	-	0
R0	0.552 (0.481-0.634)	-0.59	<0.001	6

^aModel controlling for displayed covariates in addition to age, sex, race, BMI, smoking status, Charlson comorbidity score, number of unique prescriptions, hospital volume, location of tumor, histology, and tumor size.

^bPneumonectomy given score of 0 to prevent negative scores in the model.

VALCAN-O

Veterans Affairs Lung Cancer Operative Quality Score

- *Multivariable Cox Proportional Hazards Regression Model*
- Model controlled for: patient , treatment, and tumor related variables
 - Age, Sex, Race, Smoking Status, other comorbidities + 5 Surgical Quality Metrics
- QM Weighted by strength of impact on survival
- Score: 0-13 (
 - 0 = low quality operation
 - 13 = highest / “guideline concordant



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Surgical Pause Symposium

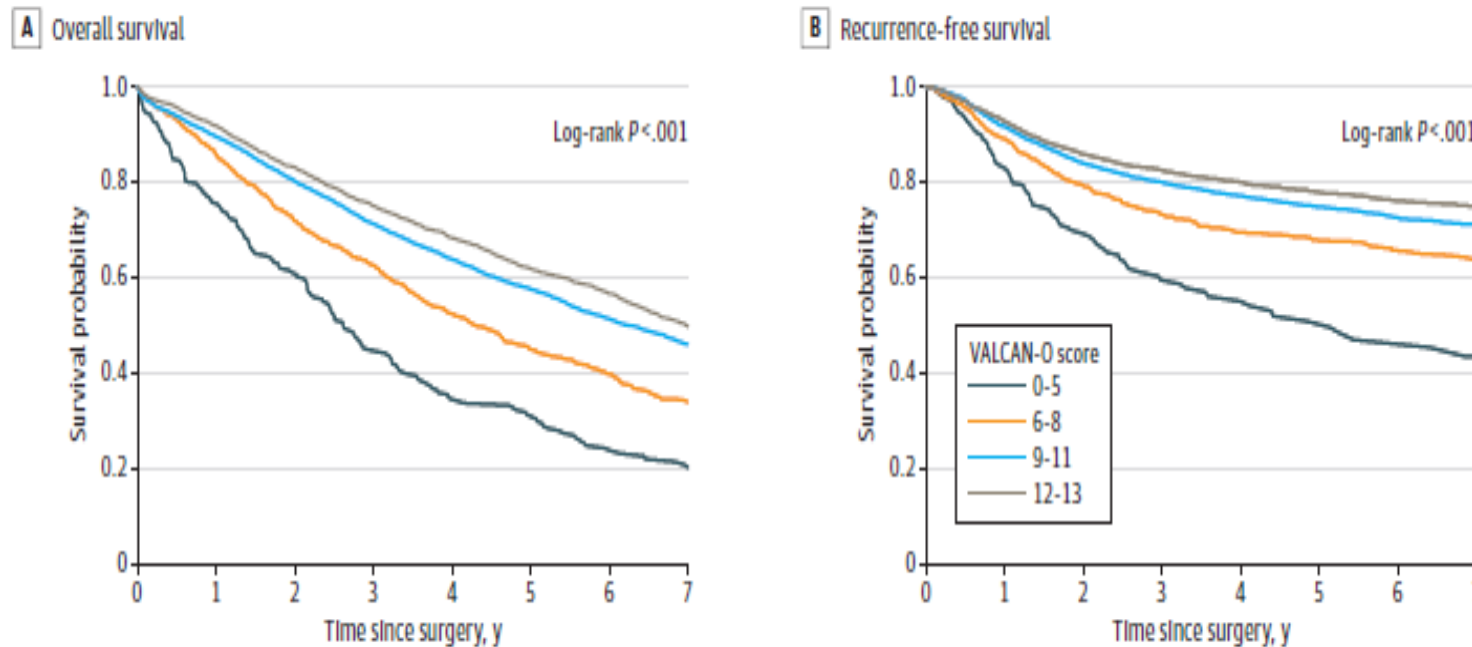
JAMA Surg. 2023;158(3):293-301. doi:10.1001/jamasurg.2022.6826
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Results from VHA

Our findings suggested that in VHA adherence to intraoperative QMs are associated with improved overall survival and recurrence free survival

Kaplan-Meier Curves Showing the Association between Veterans Affairs Lung Cancer Operative Quality (VALCAN-O) Score and Overall Survival and Recurrence-Free Survival in a VHA Cohort



➤ 34.0 % received adequate nodal sampling



➤ 41.4 % minimally invasive resections



➤ 21.8 % received non-anatomic wedge resections.

* Data Set is from 2006-2016

JAMA Surg. 2023;158(3):293-301. doi:10.1001/jamasurg.2022.6826
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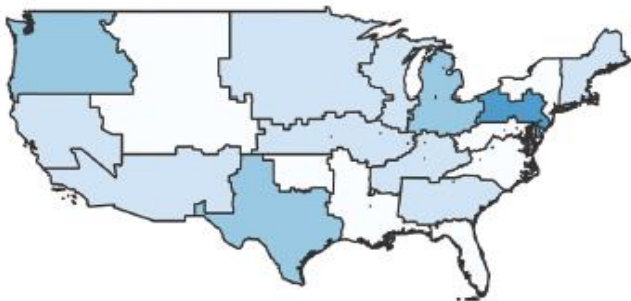
Results - Validation Cohort 1: Temporal Geographic Trends in VHA

Although the scores improved over the study period, substantial regional variation remained

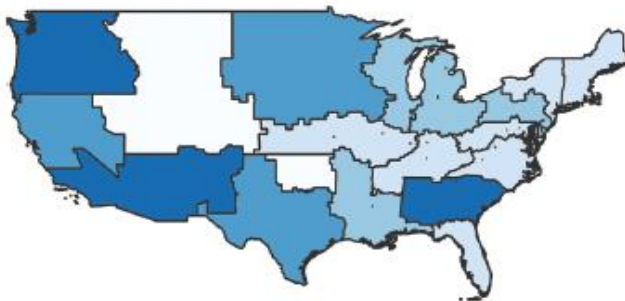
Geospatial Trends in Veterans Affairs Lung Cancer Operative Quality (VALCAN-O) Score
According to VHA Region, 2006-2019 *



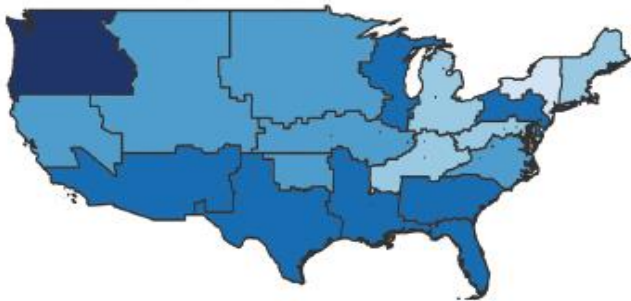
A 2006-2009



B 2010-2012



C 2013-2016



D 2017-2019



The images represent the proportion of operations in each Veterans Integrated Services Network (VISN) region obtaining a **VALCAN-O score of 12 points or higher**

- (ie, highest-quality operation),
- Darker blue represents a higher proportion.

*Alaska (VISN 20), Hawaii (VISN 21), Puerto Rico (VISN 8), and other US territories were omitted for ease of viewing.

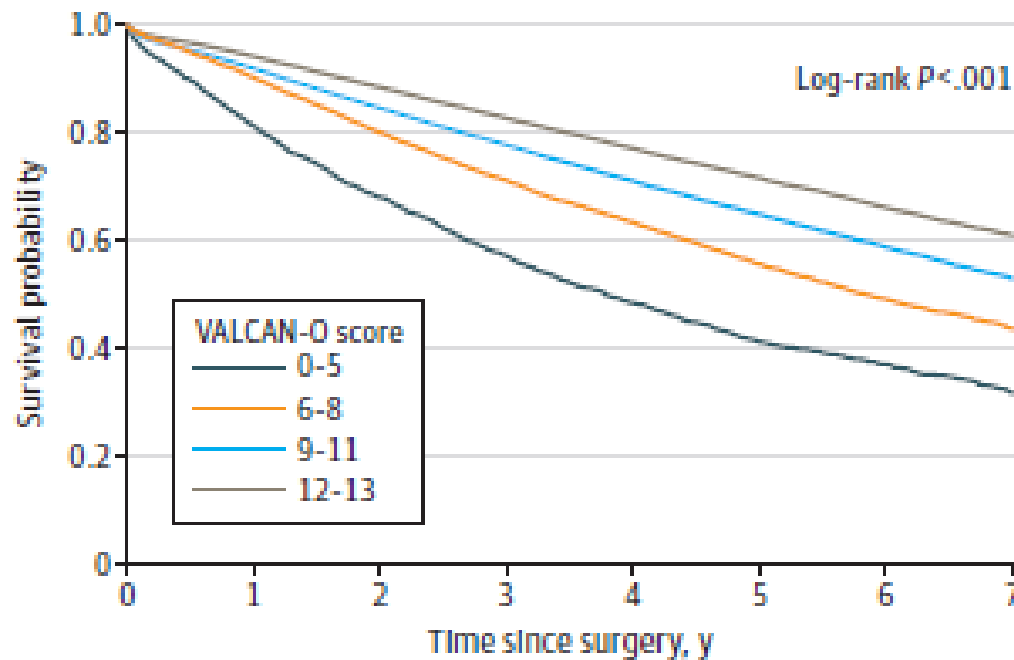
JAMA Surg. 2023;158(3):293-301. doi:10.1001/jamasurg.2022.6826
Published online January 18, 2023.



Results-Validation Cohort 2: NCDB Cohort

Our findings from the VHA cohort were validated in the National Cancer Database (NCDB) cohort who had been diagnosed with early-stage NSCLC and were treated surgically at NON-VHA Hospitals

Kaplan-Meier Curve Showing the Association between Veterans Affairs Lung Cancer Operative Quality (VALCAN-O) Score and Overall Survival in the National Cancer Database Cohort



➤ 35.2 % received adequate nodal sampling



➤ 39.2 % minimally invasive resections



➤ 21.3 % received non-anatomic wedge resections.

JAMA Surg. 2023;158(3):293-301. doi:[10.1001/jamasurg.2022.6826](https://doi.org/10.1001/jamasurg.2022.6826)
Published online January 18, 2023.

Conclusions

There is a wide variation in the quality of surgical care for early-stage NSCLC both in the VA and Non-VA Practice Settings

Adherence to the modifiable QMs, which are widely considered guideline-concordant standards of care associated with improved long-term, cancer specific outcomes has been relatively poor

The VALCAN-O Quality Score can serve as a benchmark of surgical quality in lung cancer



Why

- were we invited to present at the *Surgical Pause Symposium* where innovations that have already fostered engagement and widespread impact are being shared?!

“Surgical quality measures and other evidence-based practices are typically implemented too slowly and fail to impact clinical outcomes outside of research protocols due to inadequate consideration of implementation processes”

Mark Wilson MD PhD, Executive Director, VHA National Surgery Office

Our philosophy from the outset was that : *“ Innovation without dissemination has little value”* and that is why we partnered with one of our university-based experts in dissemination and implementation sciences when we started our investigation



Next Steps

The lack of a uniform approach developed and tested by front line staff and experts in the field could limit the positive impact of an initiative such as ours.

We are seeking additional support so that we can:

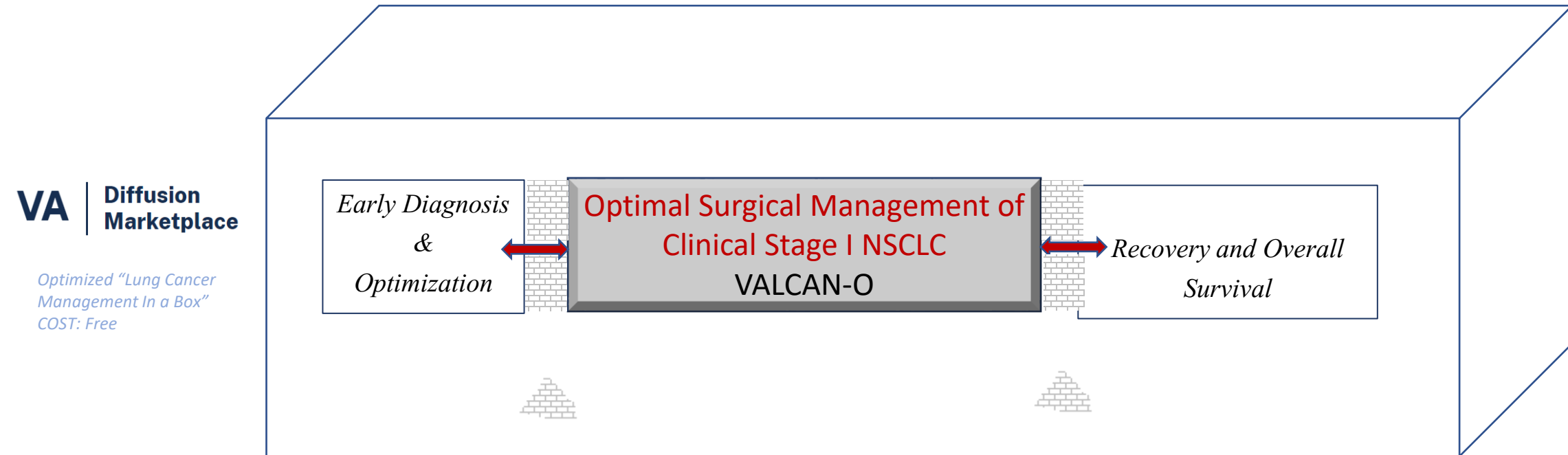
- 1. Study factors that are facilitators or barriers of adherence to the key surgical quality measures*
- 2. Develop strategies to leverage facilitators and address barriers*
- 3. Pilot –test strategies at three sites in VHA*



Vision

To share the VALCAN-O score as a tool to trigger care pathways intended to improve patient-centered outcomes and overall survival in patients with clinical stage I NSCLC receiving definitive surgical treatment

VHA to lead in providing the highest quality care for early-stage lung cancer in all practice settings throughout the United States



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



More Than Quality: VHA Must Lead the Effort

1. Exceptional Care

- ✓ More comorbidities
- ✓ Longer overall survival compared to the general population

ORIGINAL ARTICLE
Comparison Between Veteran and Non-Veteran Populations With Clinical Stage I Non-small Cell Lung Cancer Undergoing Surgery

Brendan T. Heiden, MD,* Daniel B. Eaton, Jr., MPH,† Su-Hsin Chang, PhD, SM,†† Yan Yan, MD, PhD,†† Martin W. Schoen, MD, MPH,§§ Mayank R. Patel, MD,† Daniel Kreisel, MD, PhD,*† Ruben G. Navas, MD,*† Bryan F. Meyers, MD, MPH,* Benjamin D. Kozover, MD, MPH,* and Varun Puri, MD, MSc,†§§

Objective: The aim of this study was to compare quality of care and outcomes between veteran and non-veteran patients undergoing surgery for clinical stage I non-small cell lung cancer (NSCLC).
Background: Prior studies and the lay media have questioned the quality of care that Veterans with lung cancer receive through the VHA. We hypothesized Veterans undergoing surgery for early-stage NSCLC receive high quality care and have similar outcomes compared to the general population.
Methods: We performed a retrospective cohort study of patients with clinical stage I NSCLC undergoing resection from 2006 to 2016 using a VHA dataset. Propensity score matching for baseline patient- and tumor-related variables was used to compare operative characteristics and outcomes between the VHA and the National Cancer Database (NCDB).
Results: The unmatched cohorts included 9981 VHA and 176,304 NCDB patients. The VHA had more male, non-White patients with lower education levels, higher incomes, and higher Charlson/Deyo scores. VHA patients had inferior unadjusted 30-day mortality (4.1% vs NCDB 1.7%, $P = 0.001$) and median overall survival (69.0 vs 85.7 months, $P = 0.001$). In the propensity matched cohort of 6792 pairs, VHA patients were more likely to have minimally invasive operations (60.0% vs 39.6%, $P < 0.001$) and only slightly less likely to receive lobectomy (73.1% vs 70.7%, $P = 0.023$). VHA patients had longer lengths of stay (8.1 vs 7.1 days, $P < 0.001$) but similar readmission rates (7.7% vs 7.0%, $P = 0.132$). VHA patients had significantly better 30-day mortality (1.9% vs 2.8%, $P < 0.001$) and median overall survival (71.4 vs 65.2 months, $P < 0.001$).
Conclusion: Despite having more comorbidities, Veterans receive exceptional care through the VHA with favorable outcomes, including significantly longer overall survival, compared to the general population.

From the *Division of Cardiothoracic Surgery, Department of Surgery, Washington University School of Medicine, St. Louis, Missouri; †VA St. Louis Health Care System, St. Louis, Missouri; ††Division of Public Health Sciences, Department of Surgery, Washington University School of Medicine, St. Louis, Missouri; §§Division of Hematology and Medical Oncology, Department of Internal Medicine, Saint Louis University School of Medicine, St. Louis, Missouri; and ‡Department of Surgery, Saint Louis University School of Medicine, St. Louis, Missouri.
The study is funded in part through a Cardiothoracic Surgery NIAH 75733LB07776-25 grant (BTH), and a VA 1811HX002475-01A2 grant (V.P., S.C. and V.Y.).
The authors report no conflict of interest.
Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's website, www.annalsofsurgery.com.
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3. Resources + Experience

VHA has the resources and experience to mitigate socioeconomic and racial disparities

Veteran Health & Wellness

Veteran Health & Wellness

Policymakers should be aware of these strengths when considering future VHA reforms



2. Already Delivering Equitable Care

- ✓ Black Veterans receive comparable, if not superior, care compared with their White counterparts

[Thoracic Oncology Original Research] CHEST

Racial Disparities in the Surgical Treatment of Clinical Stage I Non-Small Cell Lung Cancer Among Veterans

Brendan T. Heiden, MD; Daniel B. Eaton Jr, MPH; Su-Hsin Chang, PhD, SM; Yan Yan, MD, PhD; Ansa A. Baumann, PhD; Martin W. Schoen, MD; Mayank R. Patel, MD; Daniel Kreisel, MD, PhD; Ruben G. Navas, MD; Bryan F. Meyers, MD; Benjamin D. Kozover, MD; and Varun Puri, MD

BACKGROUND: Prior studies in the civilian population have reported racial disparities in lung cancer outcomes following surgical treatment, including inferior quality of care and worse survival. It is unclear if racial disparities exist in the Veterans Health Administration (VHA), the largest integrated health care system in the United States.
RESEARCH QUESTION: Do racial disparities affect early-stage non-small cell lung cancer (NSCLC) outcomes following surgical treatment within the VHA?
STUDY DESIGN AND METHODS: This retrospective cohort study was conducted in veterans with clinical stage I NSCLC undergoing surgical treatment in the VHA system. Demographic characteristics, access to care, surgical quality measures, and short- and long-term oncologic outcomes between White and Black veterans were evaluated.
RESULTS: From 2006 to 2016, a total of 18,800 veterans with clinical stage I NSCLC were included. The rates of definitive surgical treatment were similar between Black (57.3%) and White (58.1%) veterans ($P = .42$). The final study cohort included 9,842 patients receiving surgical treatment, of whom 8,556 (84.9%) were White and 1,486 (15.1%) were Black. Black patients were younger and more likely to smoke, although comorbidities were similar between the two groups. Black patients were somewhat less likely to receive adequate lymph node sampling (30.6% vs 33.3%; $P = .050$); however, other access-to-care metrics and surgical quality measures, including rates of anatomic lobectomy (71.9% vs 69.4%; $P = .189$) and positive margins (3.2% vs 3.1%; $P = .955$), were similar between the two groups. Although Black veterans were less likely to experience major postoperative complications, there was no difference in 30-day readmission, 30-day mortality, or disease-free survival between the two groups. Black patients had significantly better risk-adjusted overall survival (hazard ratio, 0.802; 95% CI, 0.729-0.883; $P < .001$).
INTERPRETATION: Among veterans with NSCLC undergoing surgical treatment through the VHA, Black patients received comparable care with equivalent if not superior outcomes compared with White patients.
CHEST 2022; 162(4):620-629

KEY WORDS: lung cancer; racial disparities; thoracic surgery; Veterans Health Administration

FOR EDITORIAL COMMENT, SEE PAGE 742

ABBREVIATIONS: CDHS = Corporate Data Warehouse; DFS = disease-free survival; ICD-O = International Classification of Diseases, NSCLC = non-small cell lung cancer; OS = overall survival; VHA = Veterans Health Administration.
APPROVAL: From the Division of Cardiothoracic Surgery (B. T. H., D. B. E., G. N., B. F. M., M. W. S., and V. P.) and Division of Public Health Sciences (S. H. C., Y. Y., and A. A. B.), Department of Surgery, Washington University School of Medicine VA St. Louis Health Care System (D. B. E., S. H. C., Y. Y., A. A. B., M. W. S., M. R. P., D. K., B.

G. N., and V. P.), St. Louis, MO; and the Division of Hematology and Medical Oncology (M. W. S.), Department of Internal Medicine, Saint Louis University School of Medicine, St. Louis, MO.
CONFLICT OF INTEREST: Dr. Brendan T. Heiden, MD, is a Washington University School of Medicine VA St. Louis Health Care System physician. Copyright © 2022 American College of Chest Physicians. Published by Elsevier Inc. All rights reserved.
DOI: <https://doi.org/10.1016/j.chest.2022.03.040>

920 Original Research

[1629A CHEST OCTOBER 2022]

VHA is positioned to provide the best care possible to individuals and populations as a whole



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



Thank You



Pause for Suggestions and Questions

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Division of Cardiothoracic Surgery





Surgical Pause Symposium

Inpatient Physical Therapy Gym

Amanda Graves, MSN, RN
Nurse Manager, Inpatient Surgical Unit
Western North Carolina VA Healthcare System

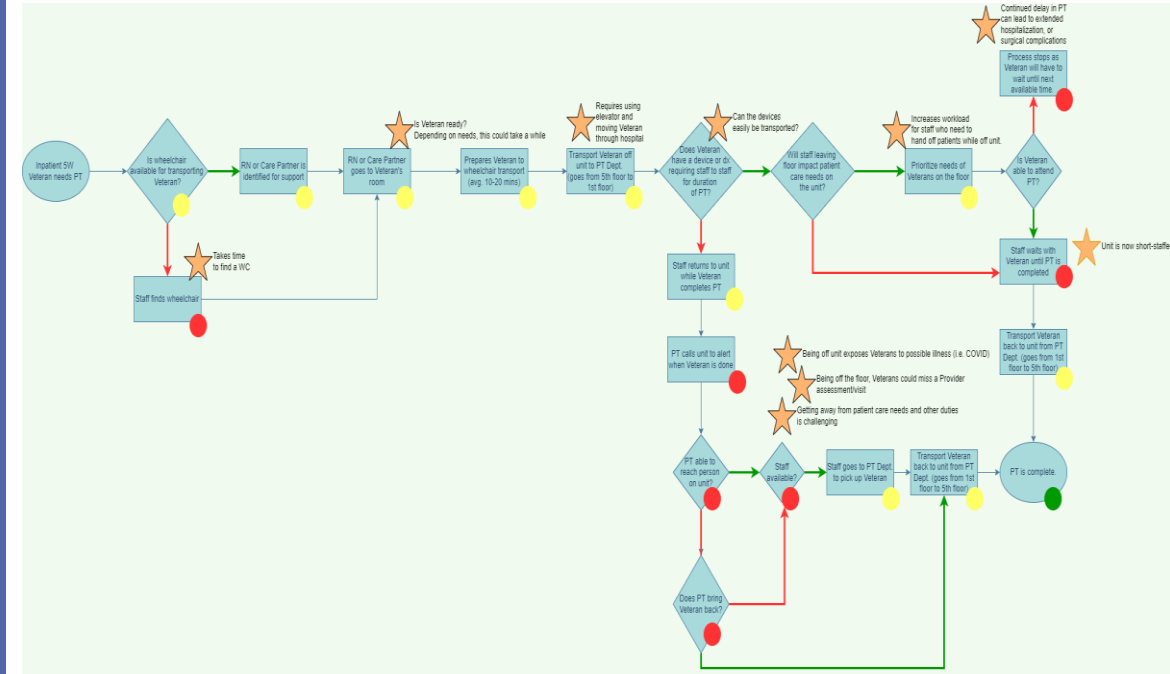
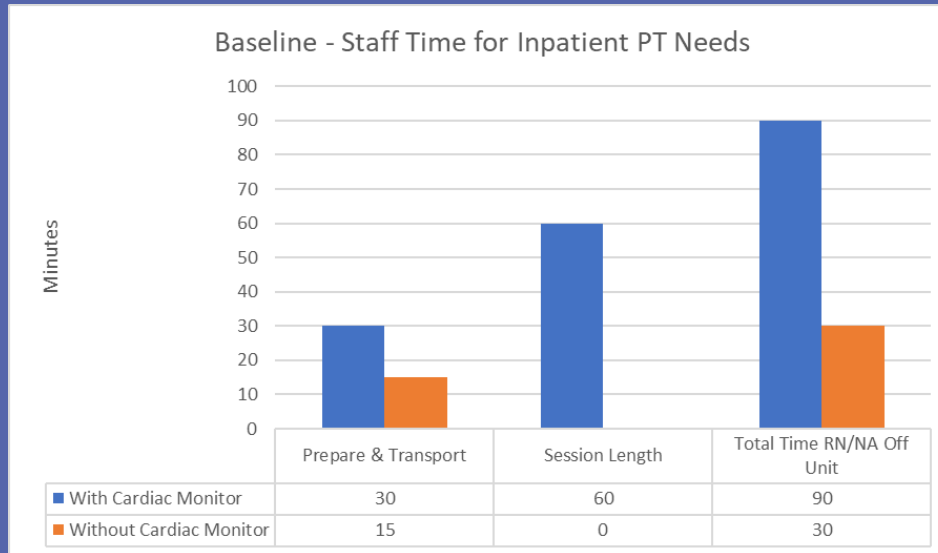


VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium

Need for Improvement

- Support ERAS program to promote early ambulation
- Delay in Physical Therapy (PT) due to COVID 19 precautions
- Time off unit for both Veteran and staff
- PT therapy appointment needing to be lengthened
- Safety concern with lack of on unit PT equipment to evaluate Veterans



Approach

Interdisciplinary workgroup was created to include:

- Nurse Manager
- PMRS Chief
- Space planning coordinator

Workgroup considered:

- Space evaluation
- Feasibility study
- Equipment needed
- Funding
- Presentation to Leadership



Proposal to Leadership – request to convert 21-bed unit to 19-bed unit

Pros

- Innovative approach to response of COVID 19 new processes
- Limit COVID 19 exposure
- Proactive approach to potential increase in LOS
- Alleviate scheduling and therapist availability
- Increase patient satisfaction
- Proactive approach to potential increase in readmittance
- Best Practice
- Reduce 5W storage of PMRS equipment
- Easy conversion room to Gym
- Easy conversion back to patient room if needed
- Supported by Chief of Orthopedics and Chief of PMRS

Cons

- Reduction of 2 inpatient beds
- Storage of patient room furniture
- Cost of Conversion
- Obtain equipment
- Housekeeping cleaning of equipment

Equipment Request

- Parallel Bars
- Stairs
- Mats
- Wall railings x2

Implementation

- Easy conversion of 2-person room
- Ability to convert room with in 24 hours back to patient room
- Equipment ordered
- Room opened while additional equipment arrived
- Assigned laptops and WOWs to therapists for documentation

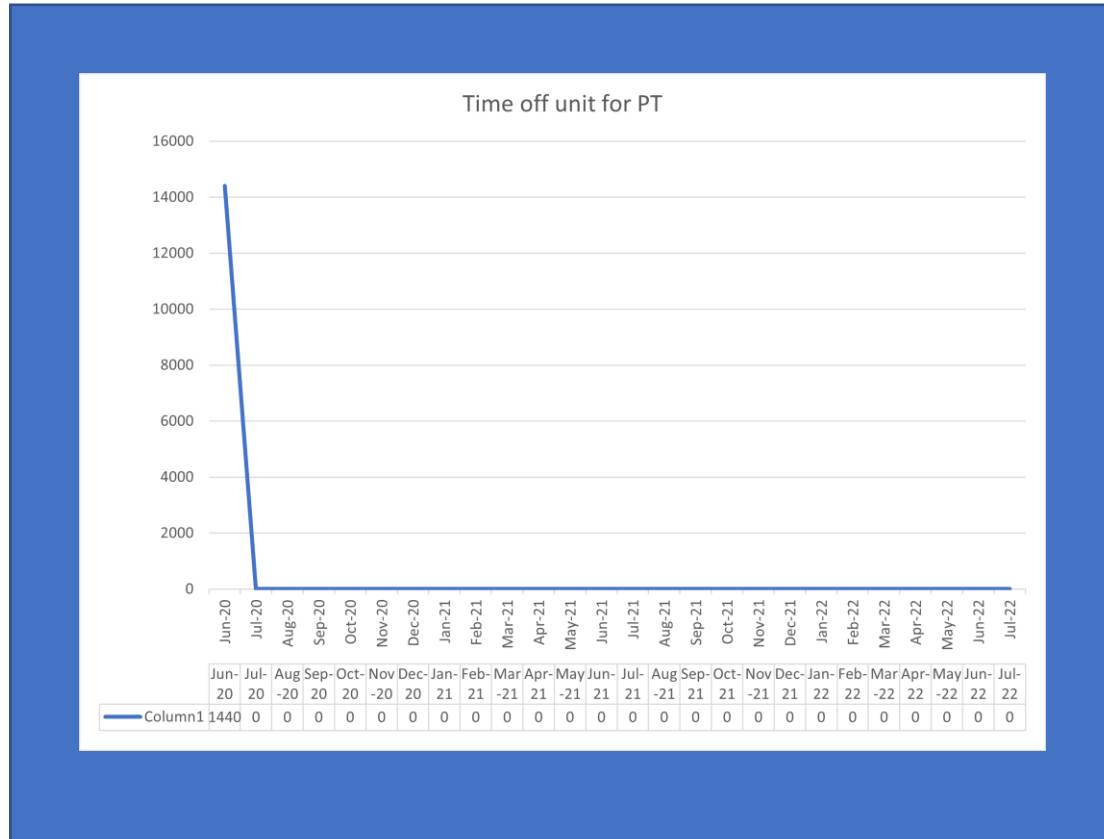


Outcomes

- Nursing staff no longer transports Veteran to PT.
- The assigned physical therapist takes patient to on unit PT gym
- Caregivers participate in PT session to encourage exercise at home
- Providers can access patient on unit during the PT session
- Physical therapist is assigned to the unit and works out of the on-unit gym
- Veterans post operative inpatient therapy sessions extended and frequency increased
- Patient were not exposed to outpatient interaction for possible COVID-19 transmission
- Communication among providers increased.
- The physical therapist, nurse, and social worker discuss therapy immediately following session.



ROI- Nursing time off unit reduced to Zero



Project Benefits Section		
Item/Issue	Quantity or Cost	Assumption (include references/hyperlinks if applicable)
Staff completing transportation	0	# Nursing staff who transported Veterans to PT
Time spent per team member (hours)	0	No longer needed nursing staff for transportation to PT
Average Employee hourly salary cost	\$42.39	Averaged salary of nursing staff (RN and NAs)
Total Project Labor costs	\$0.00	
Lost Revenue from Missed F/U Exams	\$0.00	
Project Costs Section		
Item/Issue	Quantity or Cost	Assumption (include references/hyperlinks if applicable)
Staff completing transportation	5	# Nursing staff who transported Veterans to PT
Time spent per team member (hours)	900	Number reflects the yearly average. PT transport averaged 45 minutes/Veteran. With 5 sessions/day at 45 mins/session this totals 3.75 hours/day or 900 hours/year
Average Employee hourly salary cost	\$42.39	Averaged salary of nursing staff (RN and NAs)
Total Project Labor costs	\$190,755.00	Total amount paid to staff to transport Veterans to PT/year
Project ROI Section		
Total Project Benefits	\$0.00	
Total Project Costs	\$190,755.00	
ROI	\$190,755.00	Soft Dollars Saved
% ROI	100%	
ROI Model Summary		
This project focused on reducing the nursing staff time needed to transport Veterans to Physical Therapy. Pre improvement a minimum of 5 staff/day were transporting Veterans and spending an average of 45 minutes/transportation. This totals to 900 hours/year of staff time to transport Veterans to PT. Following the process improvement no nursing staff were needed for Veteran transportation to PT resulting in a 100% cost savings and time saved. The intangibles to this project also include the reduction of workload for those staff who remained on the unit while the other staff were off-unit with the Veteran.		

Lessons Learned

Gather pre-implementation data

- Determine increased number and length of encounter
- Determine impact on decrease length of stay



What's next

- Continue to monitor success of program
- Spread best practice throughout VISN
- Spread best practice throughout VA



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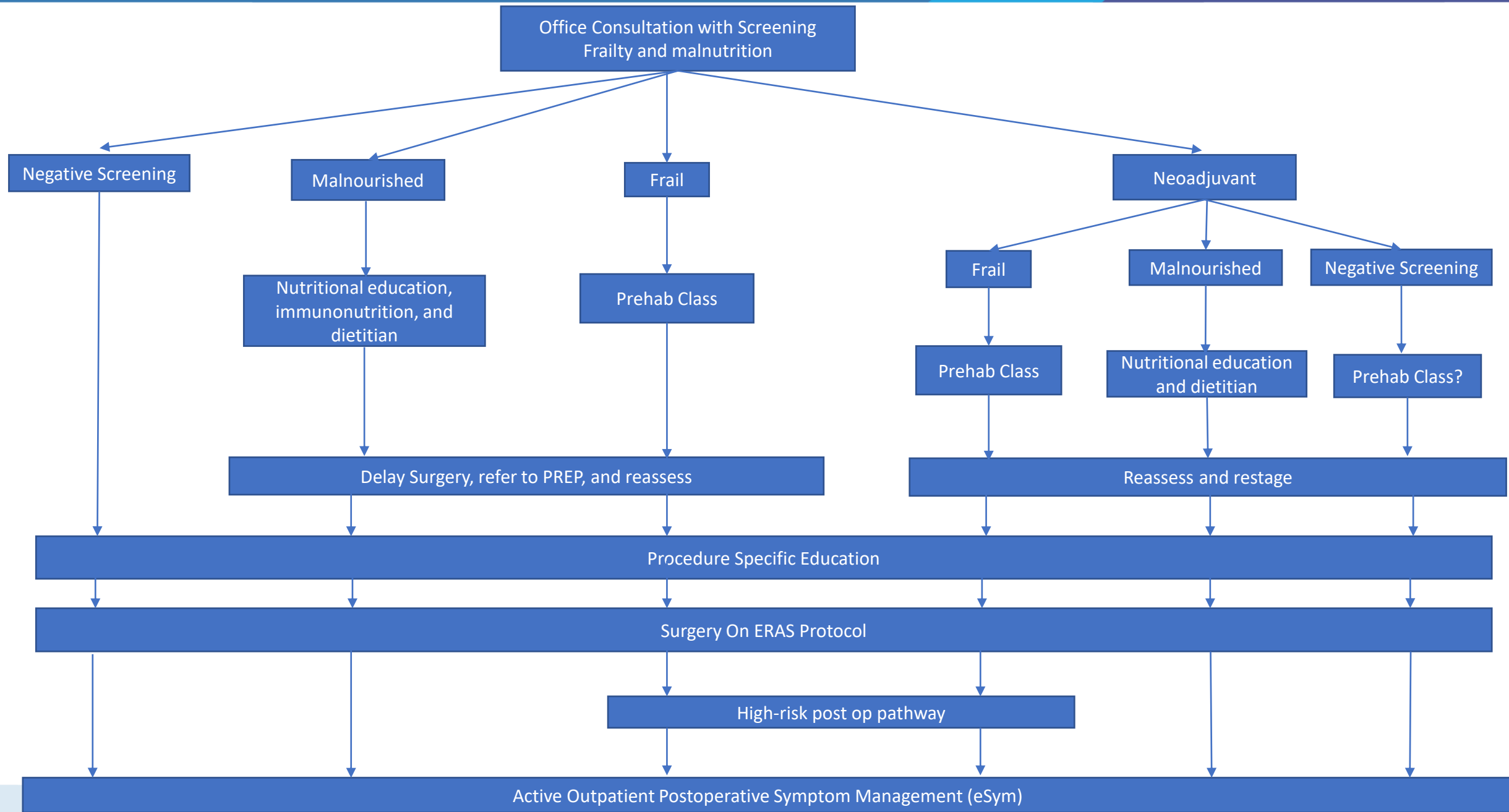
Perioperative Surgical Home: Putting it all Together



Surgical Pause Symposium

Timothy L. Fitzgerald, MD, FACS
Professor of Surgery, Tufts University School of Medicine
Chief of Surgical Oncology, MaineHealth, Maine Medical
Center





SOCIAL HISTORY:

Social History

Review of Systems

Performed by support staff and reviewed by this provider.

VITALS

BP 140/84 (BP Site: Right arm, Patient Position: Sitting, Cuff Size: Adult) | Pulse 85 | Temp 36.7 °C (98.1 °F) (Temporal)

RISK ASSESSMENT INDEX

Cancer history: Patient DOES indicate a history of cancer (5/19/2023 1:18 PM)

RAI Total Score Without Cancer: 27 (5/19/2023 1:18 PM)

RAI Total Score With Cancer: 38 (5/19/2023 1:18 PM)

MALNUTRITION SCREENING

Nutrition Screen

Have you recently lost weight without trying?: No (05/19/23 1320)

How much weight have you lost?: (not recorded)

Have you been eating poorly because of a decreased appetite?: No (05/19/23 1320)

MST Score: Not at risk (05/19/23 1320)

PHYSICAL EXAM:

Gen: alert, appears stated age and no distress

Head: Normocephalic, scalp- no lesions, without obvious abnormality

Eyes: Pupils equal. Sclerae are anicteric.

Throat: Dentition: No active problems.

Neck / Thyroid: Supple, no masses, nodes, nodules or enlargement.

Heart: normal rate, regular rhythm. No appreciable murmur noted.

Resp: Normal chest wall and respirations. Clear to auscultation, rales or wheezes.

Back: No focal spinal or CVAT

Abd: soft, non-tender. No masses, no organomegaly. No ascites.

Extremities: +1 pitting edema ankle to knee, warm and dry

Lymph: No cervical, supraclavicular, axillary, or inguinal adenopathy

Skin: No focal lesions.

Neuro: No focal loss of strength or sensation

LABS:

Lab Results

Component	Value	Date
NA	146 (H)	01/09/2023
W	2.0	01/09/2023

ADD ORDER + ADD DX (2)

Malnutrition Screening Tool' (MST)

1. Have you/the patient lost weight recently without trying?

No 0

Unsure 2

Yes, how much (kg)?

1 - 5 1

6 - 10 2

11 - 15 3

> 15 4

Unsure 2

Applies to the last six months

If unsure, ask if they suspect they have lost weight - eg, clothes are looser

For example, less than three-quarters of usual intake may also be eating poorly due to chewing and swallowing problems

2. Have you/the patient been eating poorly because of a decreased appetite?

No 0

Yes 1

3. Do you feel you look frail or under your most comfortable weight?

No 0

Yes 1

Office Consultation with Screening
Frailty and malnutrition

Negative Screening

Procedure Specific Education

Procedure Specific Education

- Specific procedure
 - PowerPoint with Voiceover
 - Whipple, Liver, HIPEC, melanoma/soft tissue, colorectal, gastric, and general abdominal surgery
- Developed by surgeons
 - Reviewed by Education and Training Program



Getting Ready for Whipple Surgery

Updated April 2022

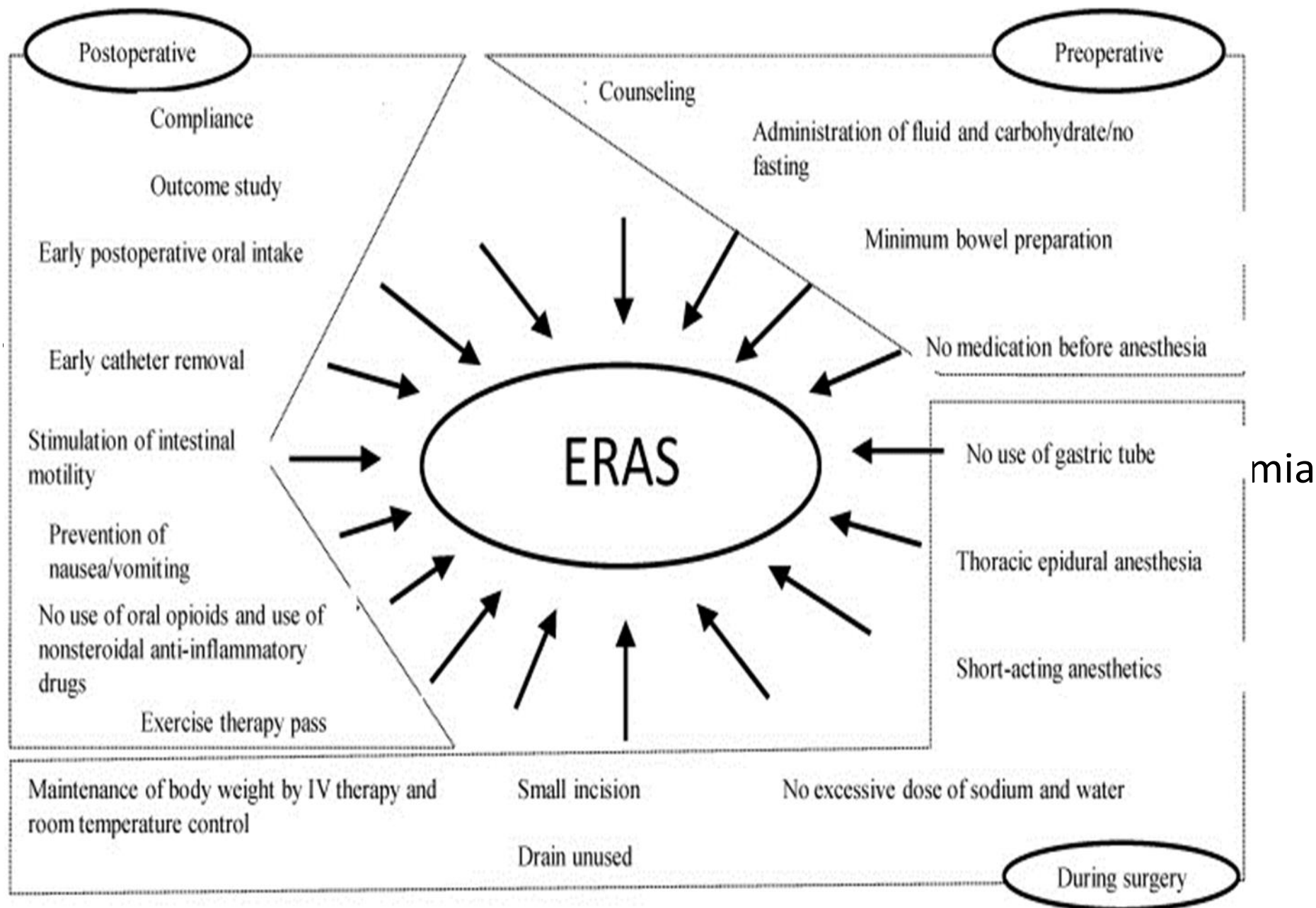


Office Consultation with Screening
Frailty and malnutrition

Negative Screening

Procedure Specific Education

Surgery On ERAS Protocol



Office Consultation with Screening
Frailty and malnutrition

Negative Screening

Procedure Specific Education

Surgery On ERAS Protocol

Active Outpatient Postoperative Symptom Management (eSym)

What are functions of eSyM?

For patients:

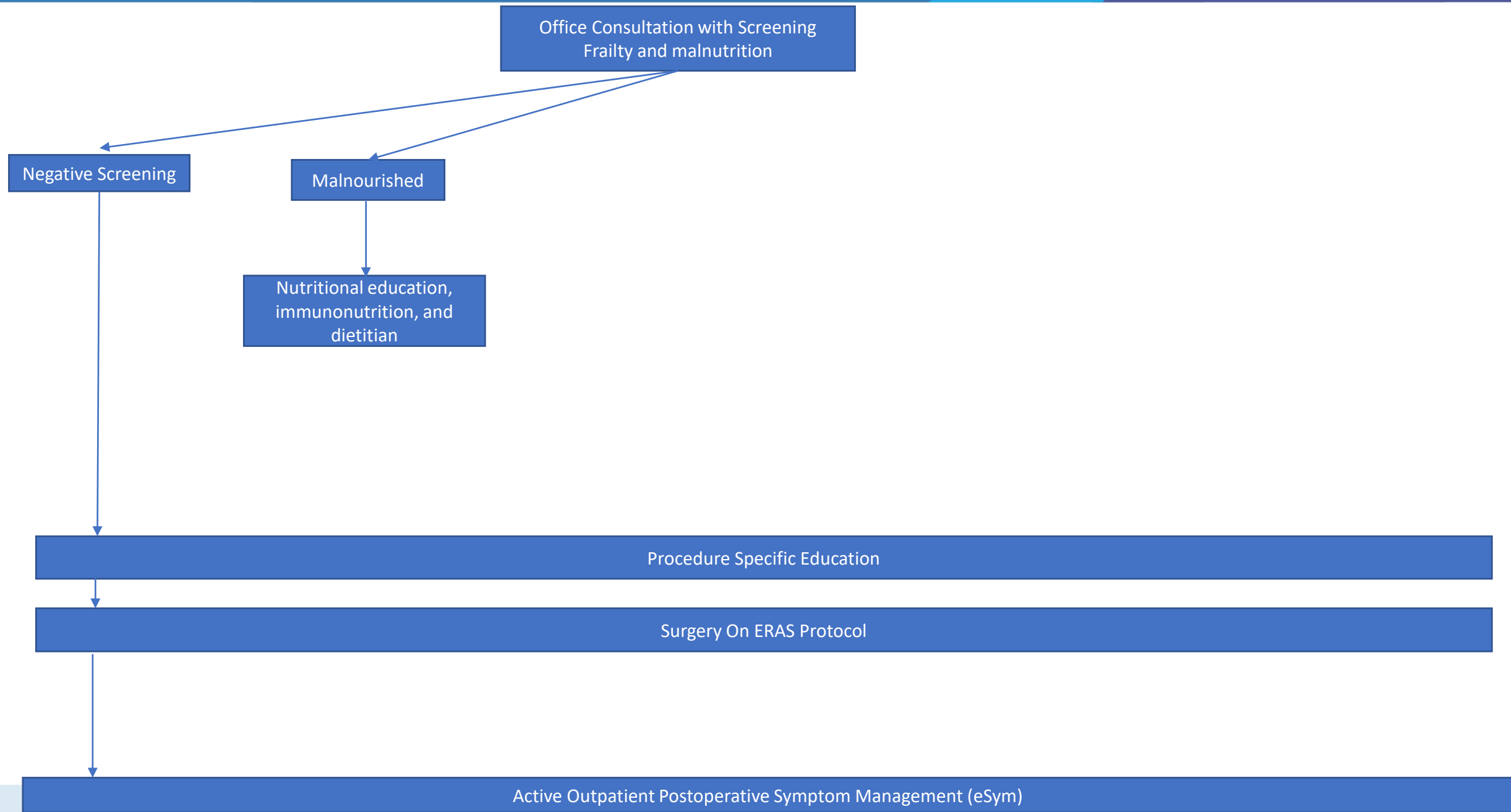
- Prompts to report
- Tips to cope
- Advice for follow up
- Alerts
- Ability to view trends



For clinicians:

- Integrated with patient record
- Panel view for cohort tracking
- Smart-phrases to simplify charting





Malnutrition

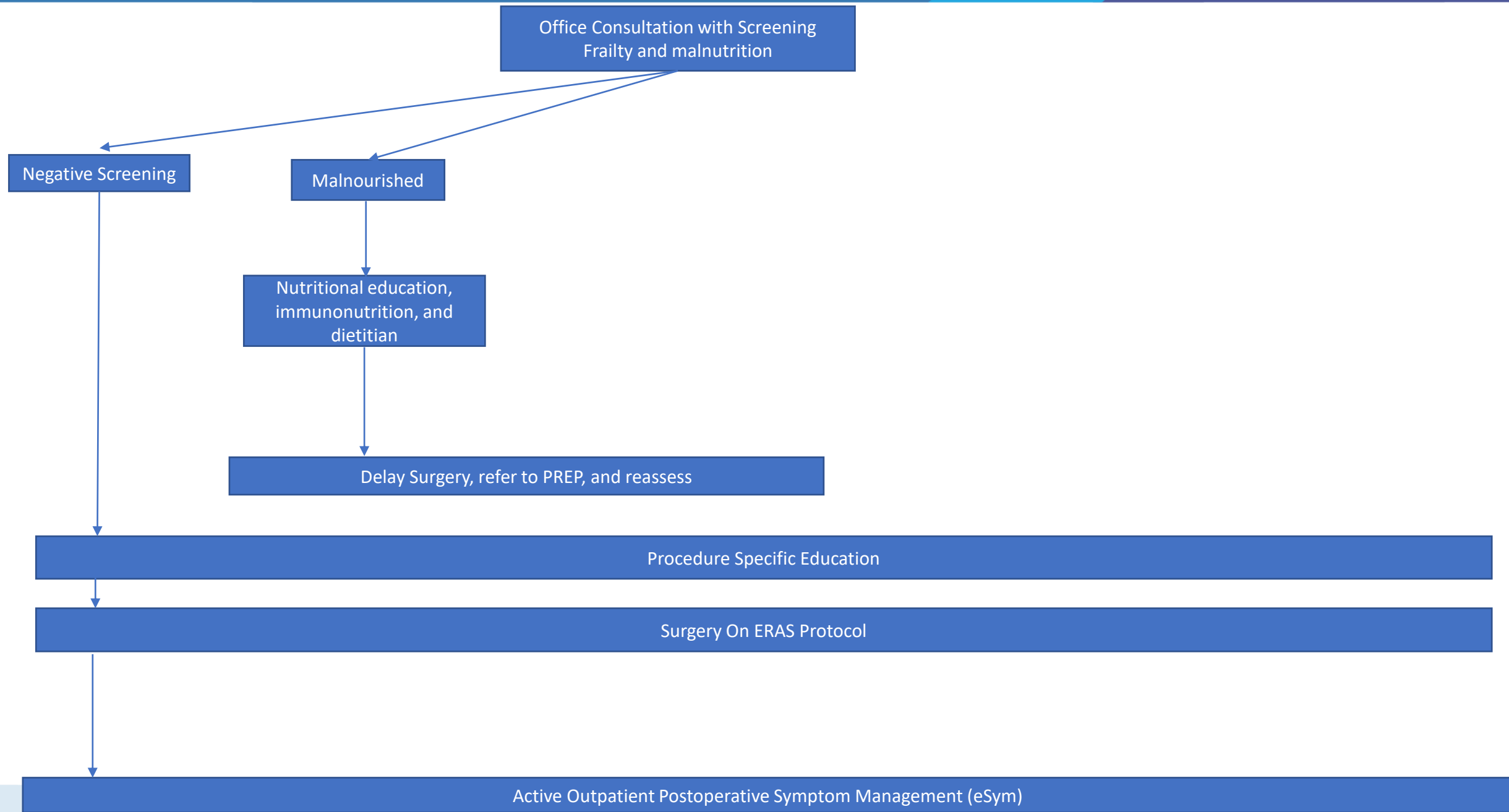
- Patient education video and handout
 - High protein and complex carbohydrate
 - 20 gm supplement whey protein with exercise
 - Preop immuno-nutrition
- Referral to nutrition

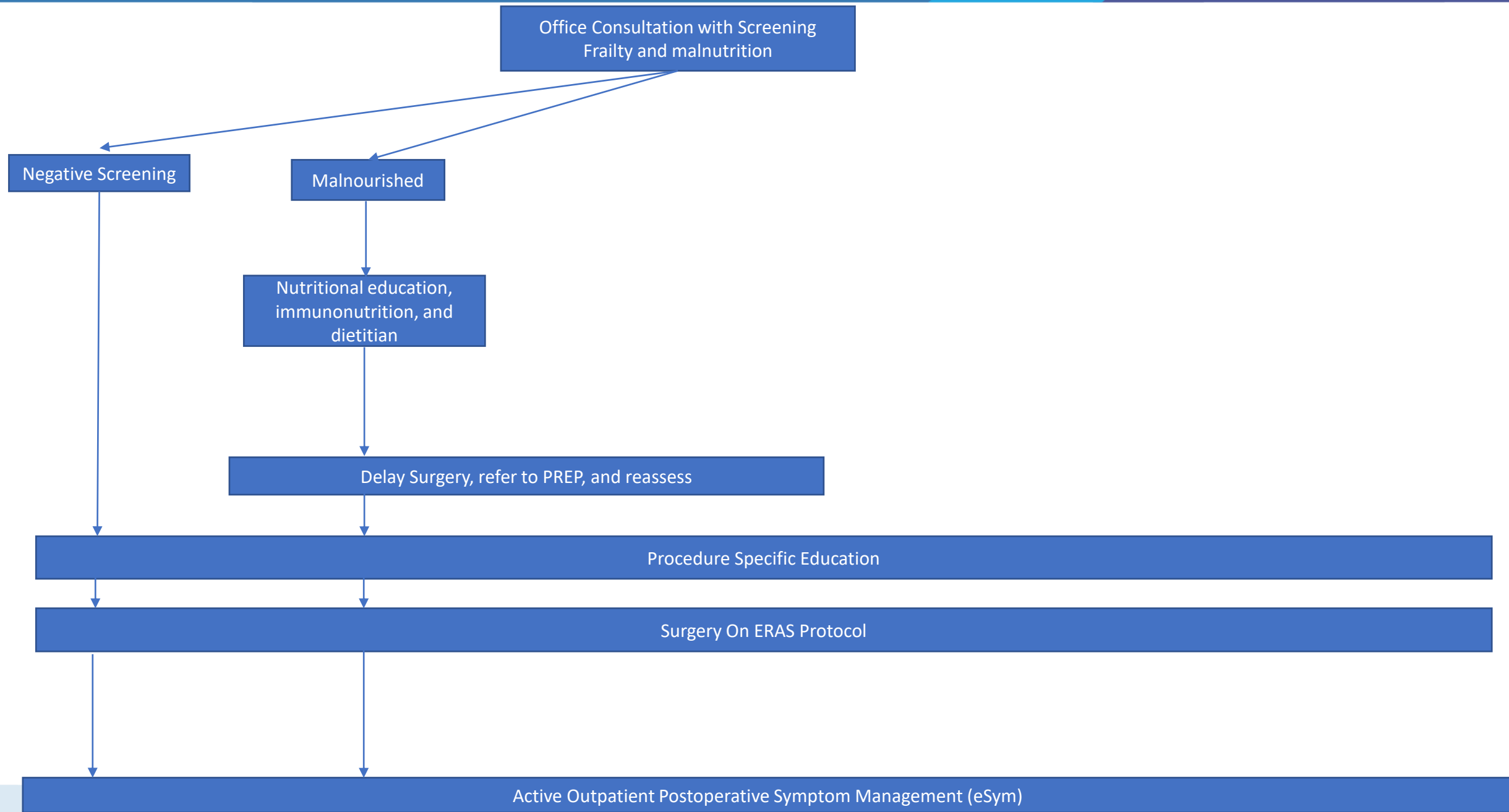


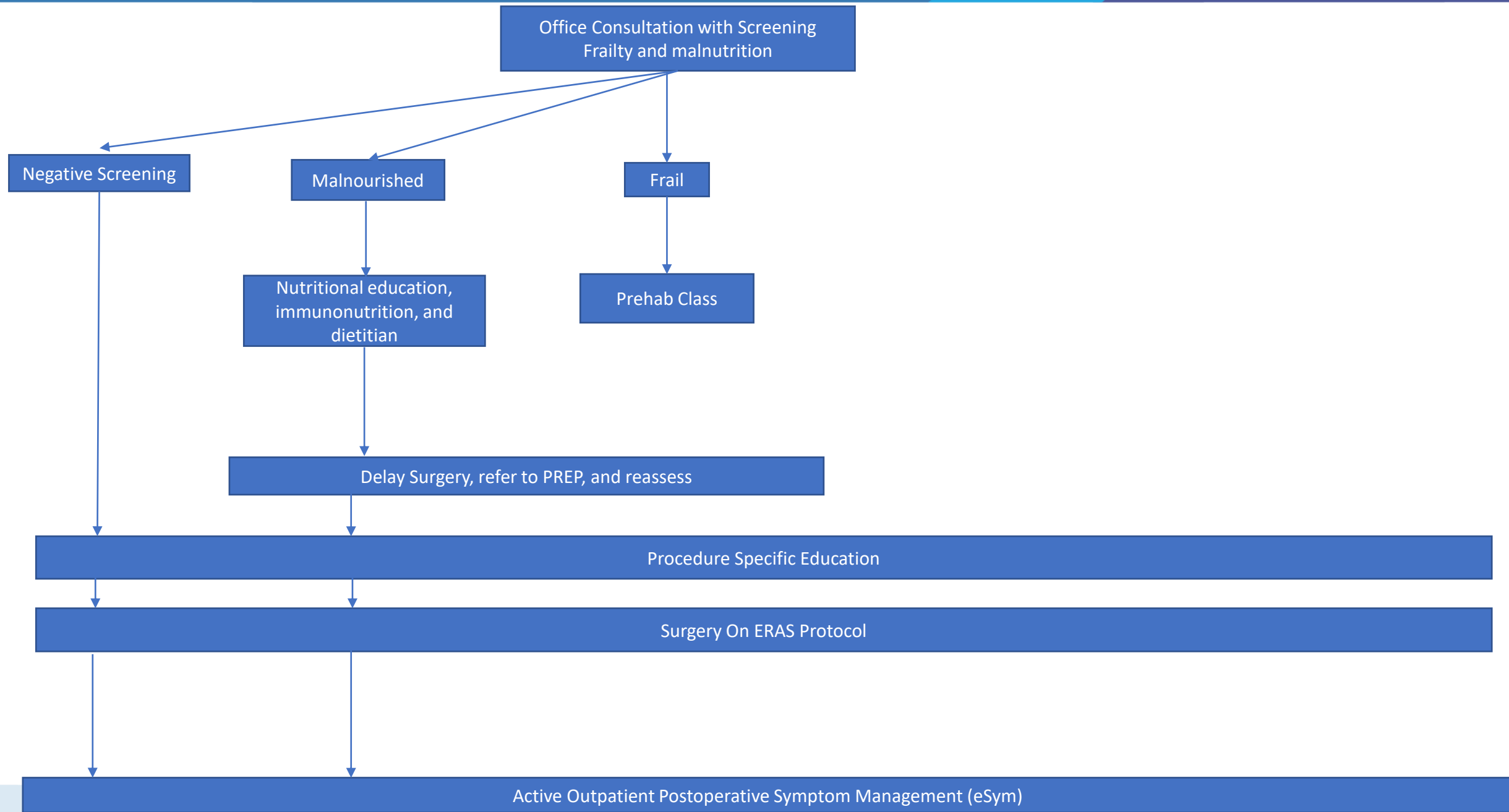
Getting Ready for Surgery
Improving Nutrition Before Surgery

Updated February 2023







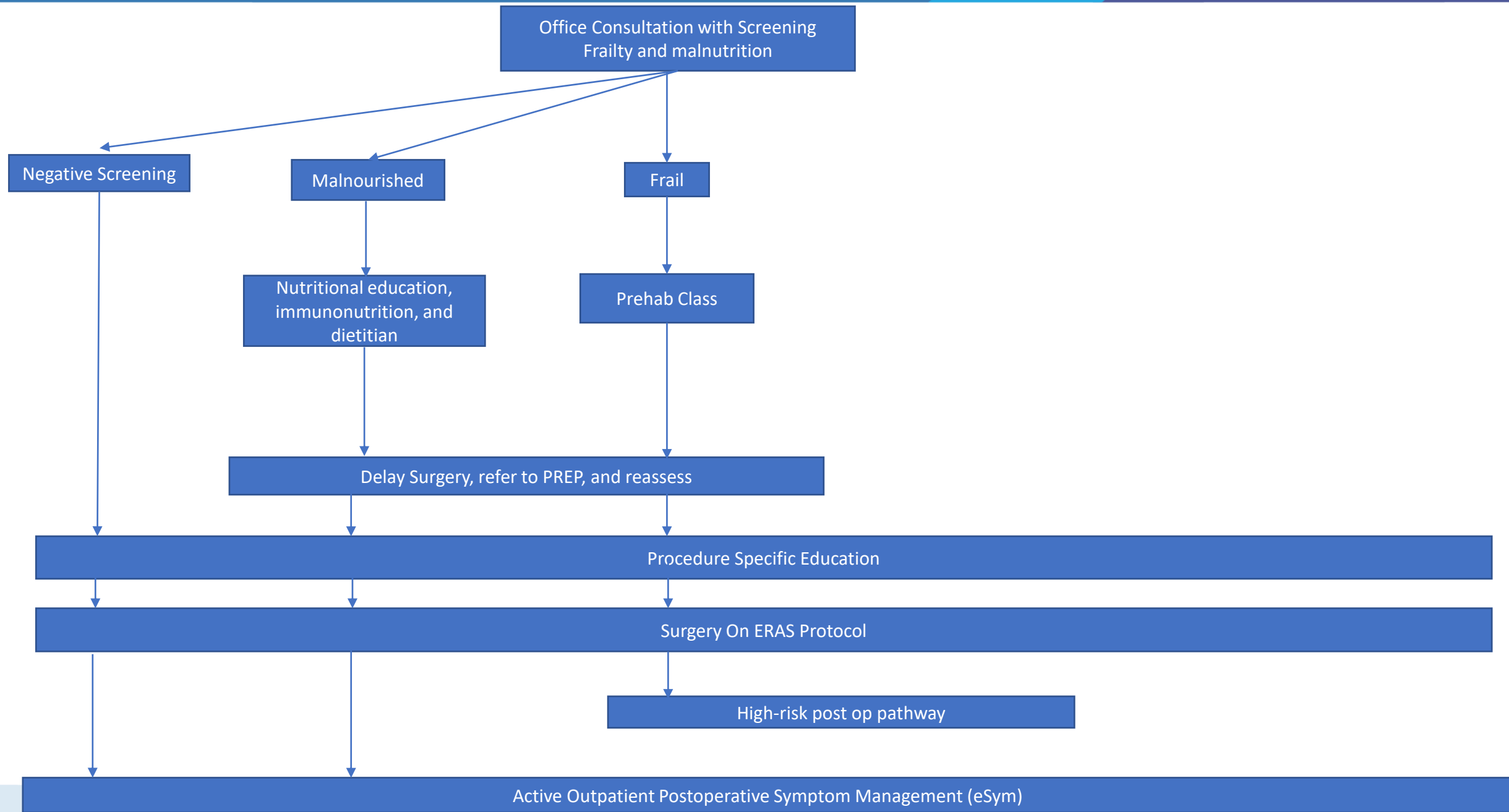


Frailty and Prehab

- Prehab class
 - Smoking and ETOH cessation
 - Home based physical prehab
 - Developed with Delphi Method
 - Onco-physical therapists
 - Pilot Project
- Nutrition
 - Patient education video and handout

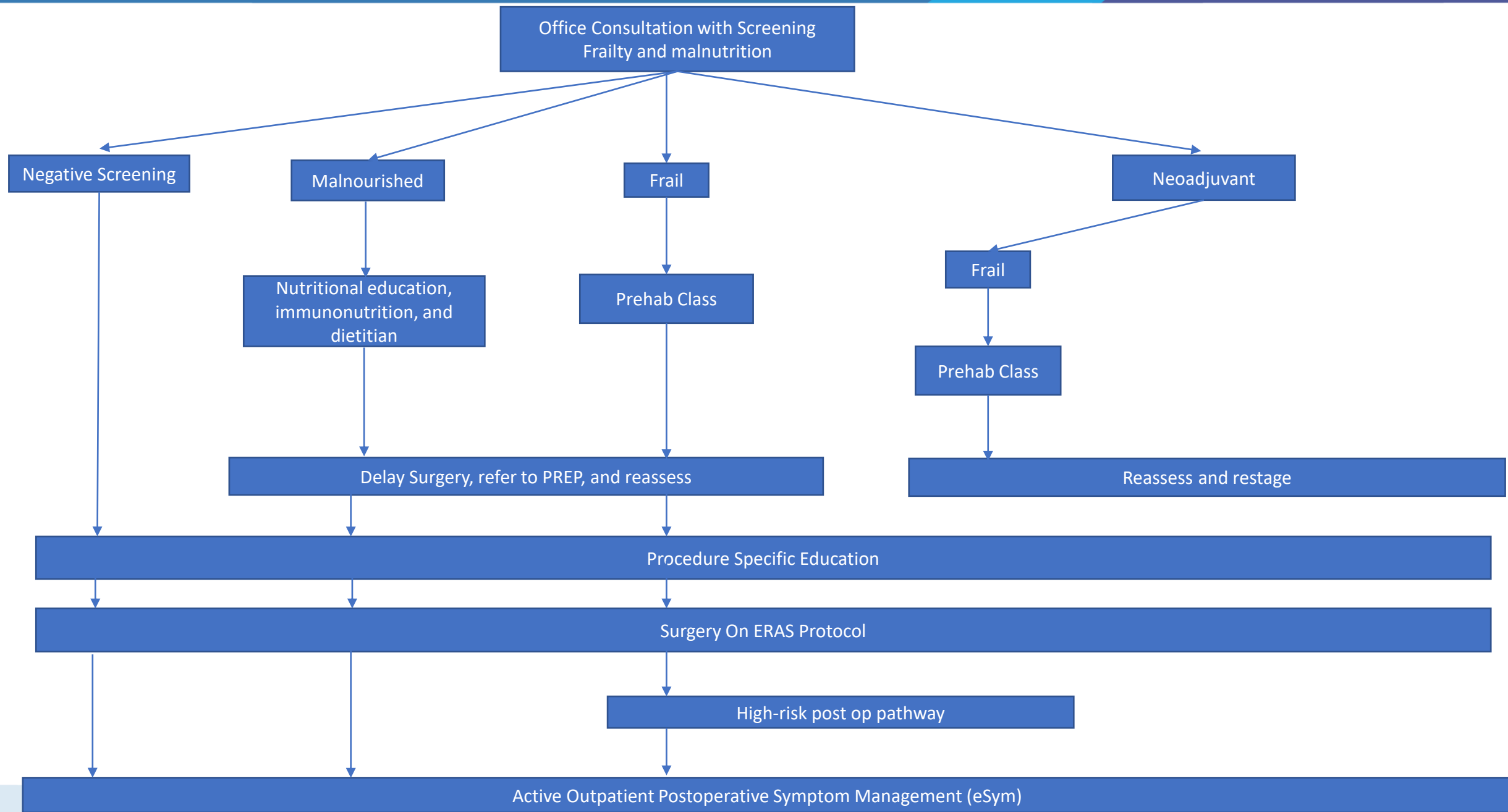
MaineHealth | Prehab Exercise
Program Introduction
Surgical Oncology

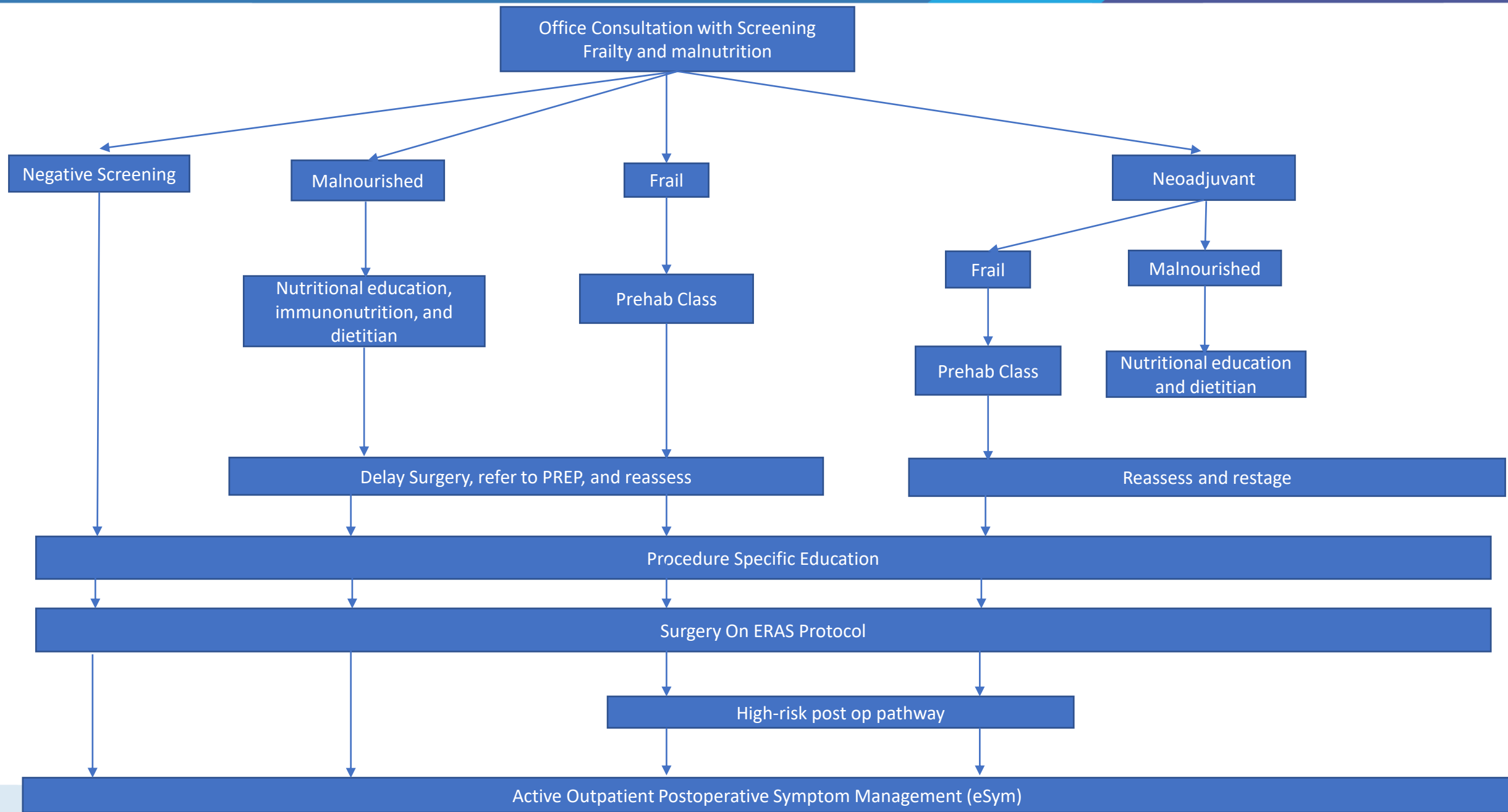


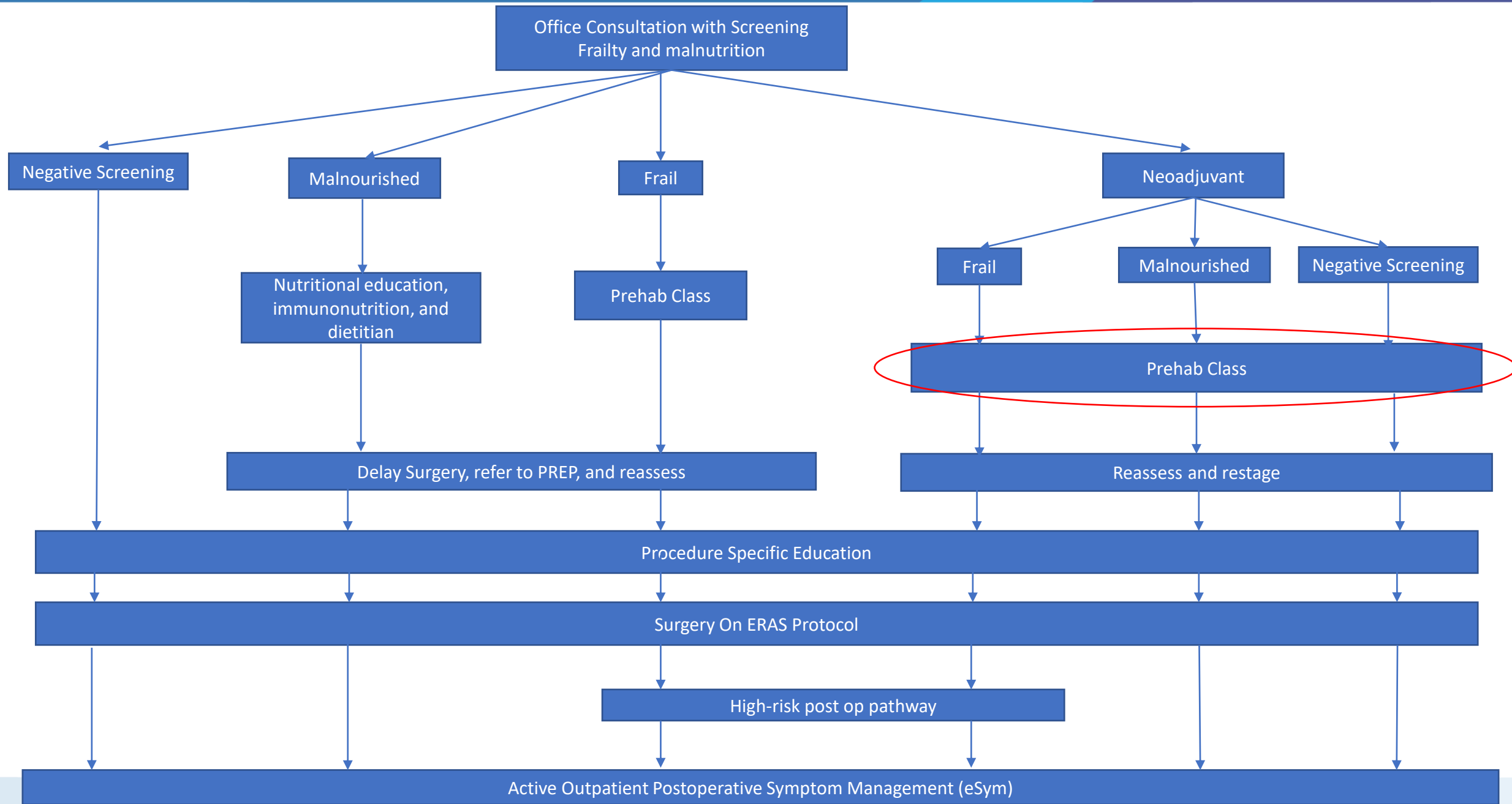


High-risk Postoperative Pathway

- Post operative delirium pathway
 - EPIC
- HELP
 - Hospital elder life program
 - Senior volunteer program
- Geriatric consult (?)
- EPIC pathway
 - Challenging







Frailty Cost: Economic Impact of Frailty in the Elective Surgical Patient

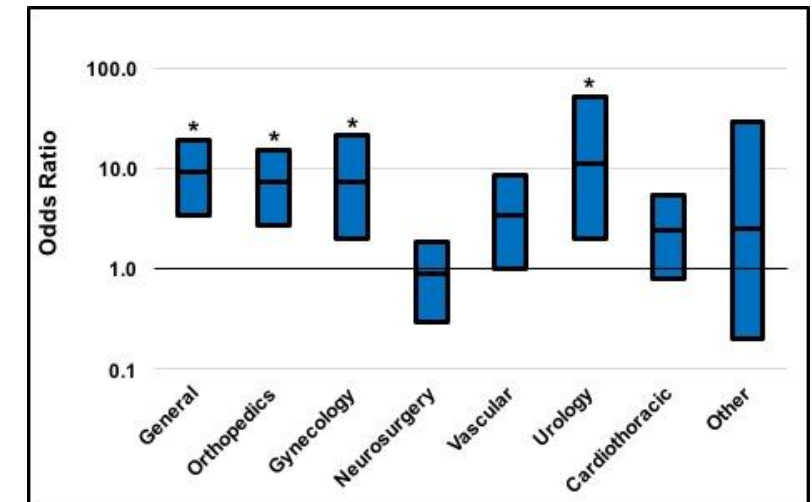


Justin G Wilkes, MD, Jessica L Evans, MS, B Stephen Prato, MS, Steven A Hess, MD, FACP, FACC, Dougald C MacGillivray, MD, FACS, Timothy L Fitzgerald, MD, FACS

BACKGROUND: Frailty in the surgical patient has been associated with increased morbidity, mortality, and

- Frailty is an independent predictor of economic outcomes in elective surgery
 - Increased Cost
 - Decreased Net Income
- Multivariate analysis with inclusion of frailty, negates effect of age on these parameters

The Effect of Frailty on Net Income is variable by Service line for Inpatient Procedures



Impact of malnutrition on gastrointestinal surgical patients

Catalina Mosquera, MD,^a Nicholas J. Koutlas, BS,^b
Kimberly C. Edwards, RDN, LDN,^c Ashley Strickland, RDN, LDN, CNSC,^c
Nasreen A. Vohra, MD,^a Emmanuel E. Zervos, MD,^a
and Timothy L. Fitzgerald, MD^{a,*}

- Nutritional status evaluation by registered dietitians using A.S.P.E.N/A.N.D criteria Well nourished vs. moderately/severely malnourished
- Malnutrition is associated to increase LOS and hospital cost

Outcome	Nutritional status	Occurrence	Univariate, p value	Multivariate
Severe complications	Well nourished Mod/sev malnourished	16% 30%	0.003	1.52 (0.18)
Prolonged LOS	Well nourished Mod/sev malnourished	40.5% 62.3%	0.001	1.67(0.05)
High hospital cost	Well nourished Mod/sev malnourished	43.8% 75.2%	<0.0001	2.58 (0.001)
Readmission	Well nourished Mod/sev malnourished	16% 25.6%	0.045	1.31 (0.39)
Mortality	Well nourished Mod/sev malnourished	2.3% 7.5%	0.021	2.18(0.2)

Timothy L. Fitzgerald

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Surgical Pause Symposium



TAKING IT TO THE NATION

Sandhya A. Lagoo-Deenadayalan
Duke University and Durham VA HCS
Durham, NC

June 2023



A 12 Year Journey

- POSH: Perioperative Optimization of Senior Health Clinic
- GSV: Geriatric Surgery Verification Program
- Taking it to the Nation
 - Interprofessional Care and Education
 - Standardization and Sustainability
 - A Stand against Ageism



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium





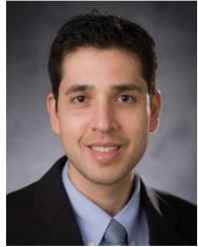
Michael Lidsky, MD



Paul Speicher, MD



Srinevas Reddy, MD



Andrew Barbas, MD



John Scarborough, MD



Rachel Rose Cohen

Major liver resection in elderly patients: a multi-institutional analysis. J Am Coll Surg 2011.

Comparison of the use of multi-modality therapy and outcomes between young and elderly patients undergoing surgical resection of pancreatic cancer. JAGS, 2012

Advanced age is an independent predictor for increased morbidity and mortality after emergent diverticulitis surgery. Surgery 2012

Failure-to-pursue rescue: explaining excess mortality in elderly emergency general surgical patients with preexisting "do-not-resuscitate" orders. Ann Surg. 2012

Expectations and outcomes in patients with do-not-resuscitate orders undergoing emergent surgical management of bowel obstruction. JAMA Surg. 2013

The Impact of Functional Dependency on Outcomes After Complex General and Vascular Surgery. Annals of Surgery, 2014.

Exploring predictors of complication in older surgical patients: Deficit Accumulation Index and the Braden Scale
JAGS, 2012

DUKE POSH - est. 2011

- Step 1: Surgeons refer older patients undergoing elective procedures
- Criteria: cognitive impairment, poor nutrition, multiple chronic conditions, functional dependency, impaired vision/hearing, polypharmacy,
- Step 2: Single visit, multidisciplinary, inter professional evaluation focused on identifying and mitigating risk factors for post-operative complications
- Step 3: Post-operative geriatrics consult for management of medical conditions, medications, pain, complications, and planning for post-hospital care

Preop assessments

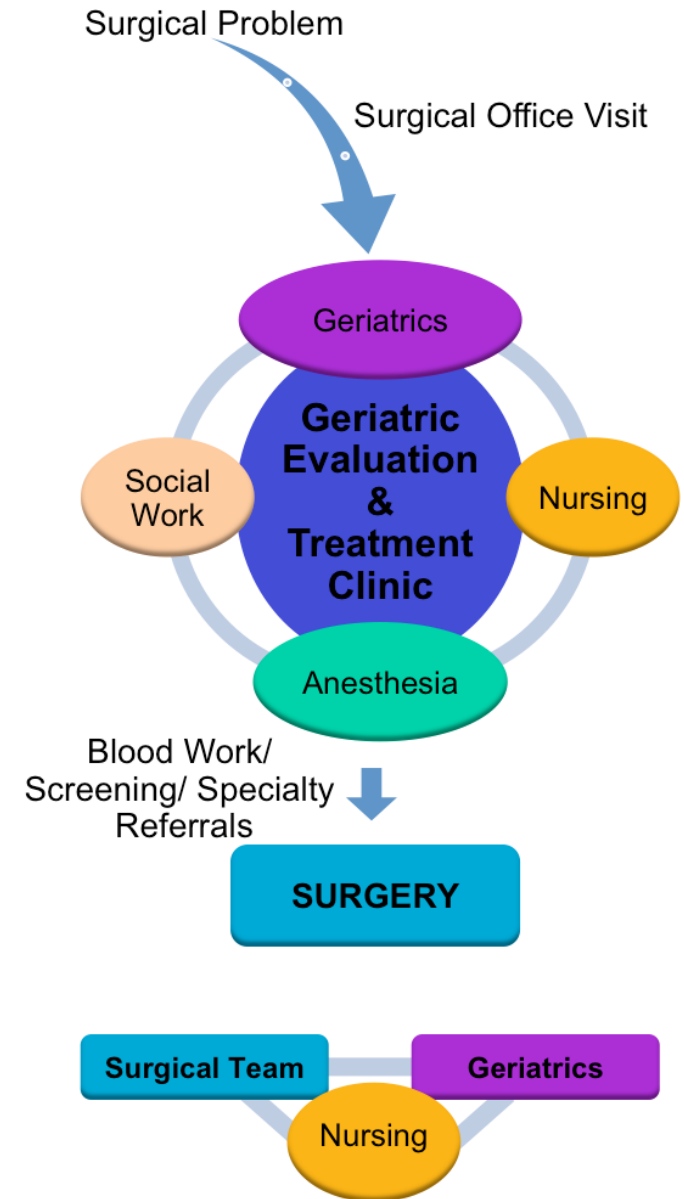
Medical and social history Medications:
Beers Criteria
Function—ADLs, IADLs
Mobility— Gait speed
Cognition— SLUMS
Mood— Koenig/PHQ2-9
Vision and hearing
Nutrition
Caregiver support
Goals and expectations

Preop Interventions

- Medical risk —CV, Pulm
- Prehabilitation
- Nutritional supplements
- Medication management
- Delirium prevention
- Advance directives
- Planning for transition and disposition

Post-operative

- Manage medical problems
- Manage medications
- Prevent and manage delirium
- Treat pain
- Promote mobility and nutrition
- Educate family and staff
- Ease transitions



VA POSH - est. 2015 : Specialty Care Education Center of Excellence:

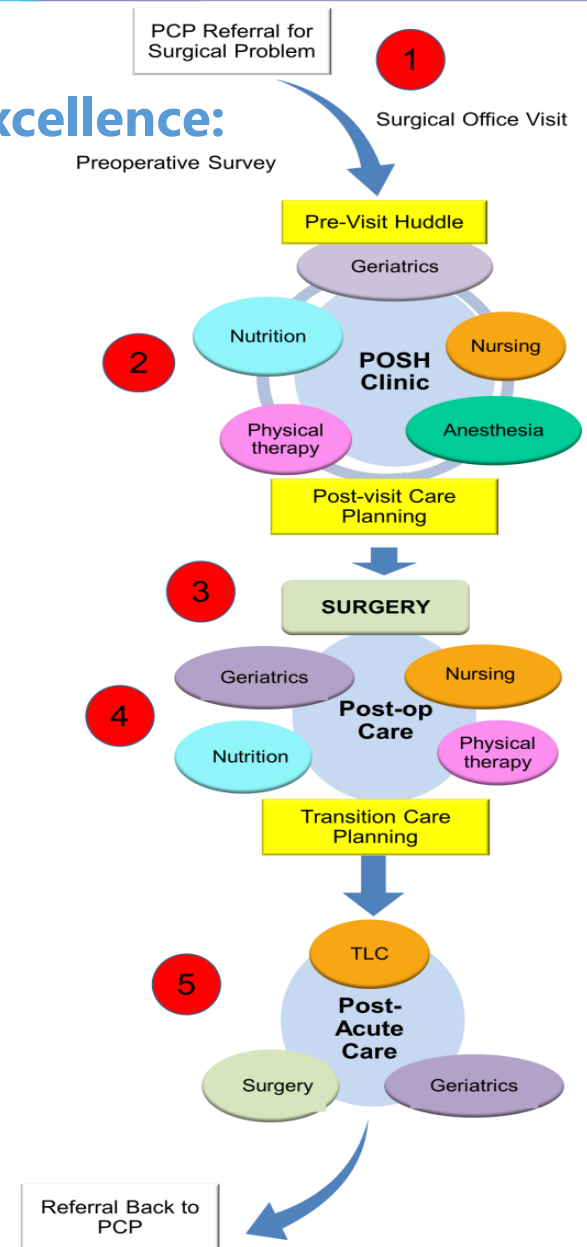
70th Anniversary
VA Academic Affiliations

Educational Partnerships
"To educate for VA and for the Nation"

Pre-Op Clinic

- Pre-clinic conference (huddle – hybrid model)
- Assessments
 - All patients: Nursing, Geriatrics, Anesthesia, Surgery, Pharmacy
 - Select patients: PT/OT, Nutrition, SW, Chaplain, Psychiatry, Palliative Care
- Post-clinic care planning conference (hybrid model)
- Experiential Inter Professional Learning

Post-Op Geriatric Co-Management with Surgery



POSH: Innovative Elements & Value-based Care

Development and validation of machine learning models to identify high-risk surgical patients using automatically curated electronic health record data (Pythia): A retrospective, single-site study

Kristin M. Corey¹*, Sehj Kashyap¹, Elizabeth Lorenzi², Sandhya A. Lagoo-Deenadayalan³, Katherine Heller², Krista Whalen¹, Suresh Balu¹, Mitchell T. Heflin⁴, Shelley R. McDonald⁴, Madhav Swaminathan⁵, Mark Sendak¹

PLOS Medicine | <https://doi.org/10.1371/journal.pmed.1002701> November 27, 2018

Physical Activity Trackers: Promising Tools to Promote Resilience in Older Surgical Patients

Miriam C. Morey^{1,2,3*}, Kenneth M. Manning¹, Ying Guo^{3,4}, Shelley R. McDonald^{1,2,3}, Mitchell T. Heflin^{1,2,3}, Kathryn N. Porter Starr^{1,2,3}, Richard Sloane^{1,3}, Nancy L. Loyack⁶, Sandhya Lagoo-Deenadayalan^{3,5,6}

J Surg: JSUR-1156. DOI: 10.29011/2575-9760.001156

J Am Geriatr Soc. 2018 March ; 66(3): 584–589. doi:10.1111/jgs.15261.

Preoperative Cognitive Impairment as a Predictor of Postoperative Outcomes in a Collaborative Care Model

Kahli Zietlow, MD¹, Shelley R. McDonald, DO, PhD¹, Richard Sloane, MPH², Jeffrey Browndyke, PhD³, Sandhya Lagoo-Deenadayalan, MD, PhD⁴, and Mitchell T. Heflin, MD, MHS^{1,2}

- Person-centered approach
- Multi-disciplinary, interprofessional teams
- Individualized risk assessment and optimization plans
- Care integrated across settings and systems
- Population-based care
- Interprofessional Education

Research

JAMA Surgery | Original Investigation

Association of Integrated Care Coordination With Postsurgical Outcomes in High-Risk Older Adults The Perioperative Optimization of Senior Health (POSH) Initiative

Shelley R. McDonald, DO, PhD; Mitchell T. Heflin, MD, MHS; Heather E. Whitson, MD, MHS; Thomas O. Dalton, MD; Michael E. Lidsky, MD; Phillip Liu, MD, MBA; Cornelia M. Poer, MSW, LCSW; Richard Sloane, MPH; Julie K. Thacker, MD; Heidi K. White, MD, MHS, MEd; Mamata Yanamadala, MBBS, MSc; Sandhya A. Lagoo-Deenadayalan, MD, PhD

JAMA Surgery, 2018;153(5):454

World J Surg (2021) 45:109–115
<https://doi.org/10.1007/s00268-020-05772-z>

World Journal of Surgery



ORIGINAL SCIENTIFIC REPORT

Perioperative Optimization of Senior Health (POSH): A Descriptive Analysis of Cancelled Surgery

Kahli E. Zietlow¹ · Serena P. Wong² · Shelley R. McDonald² · Cathleen Colón-Emeric² · Christy Cassas² · Sandhya Lagoo-Deenadayalan³ · Mitchell T. Heflin²

Delaying Elective Surgery in Geriatric Patients: An Opportunity for Preoperative Optimization

Serena P Wong, DO,*† Kahli M. Zietlow, MD,*† Shelley R. McDonald, DO, PhD,*† Atilio Barbeito, MD,‡ Cathleen S. Colon-Emeric, MD,*† Sandhya A. Lagoo-Deenadayalan, MD, PhD,†§ Nancy Loyack, DNP,FNP-BC,† and Mitchell T. Heflin, MD,MHS*‡

2019 International Anesthesia Research Society.

Geriatric Preoperative Optimization: A Review



Kahli E. Zietlow, MD,^a Serena Wong, MD,^b Mitchell T. Heflin, MD,^{b,c} Shelley R. McDonald, DO,^{b,c} Robert Sickeler, MD,^d Michael Deviney, MD, PhD,^e Jeanna Blitz, MD,^e Sandhya Lagoo-Deenadayalan, MD, PhD,^f Miles Berger, MD, PhD^e

^aDivision of Geriatrics and Palliative Medicine, Department of Medicine, Michigan Medicine, Ann Arbor; ^bDivision of Geriatrics, Department of Medicine, Duke Health, Durham, NC; ^cGeriatric Research Education and Clinical Center, Durham Veterans Affairs Medical Center, Durham, NC; ^dDepartment of Anesthesiology, Stamford Hospital, Conn; ^eDepartment of Anesthesiology, Duke University School of Medicine, Durham, NC; ^fDepartment of Surgery, Duke Health, Durham, NC.

The American Journal of Medicine (2022) 135:39–48

How can we make this the standard of care for all older adults undergoing surgery ?





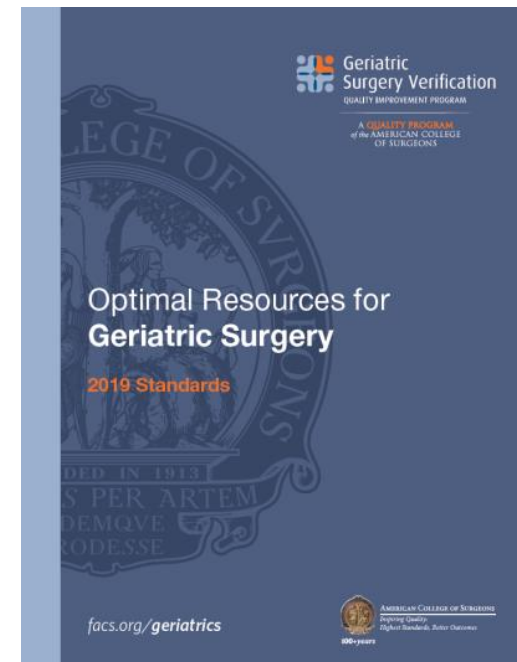
GERIATRIC SURGERY VERIFICATION

FOUR CARE DOMAINS

- Goals of Care and Decision Making
- Cognition Screening and Delirium
- Maintenance of Function and Mobility
- Nutrition and Hydration Optimization

And FOUR STAKEHOLDERS

- Patients
- Family and caregivers
- Providers
- Health system



Is this work sustainable and financially feasible?



Rocky Mountain Regional VA – GSV Level 1



“Patients cared for by the GSV Program had a reduced postoperative length of stay (median 4 days vs. 5 days, $p < 0.01$; mean 5.4 days vs. 8.8 days, $p < 0.01$); Independent of age, operative time, and comorbidities.”

JOHN HOPKINS UNIVERSITY SCHOOL OF MEDICINE

Early Outcomes following Implementation of a Multispecialty Geriatric Surgery Pathway

Ehrlich, April L. MD^{1,2}; Owodunni, Oluwafemi P. MD, MPH^{1,2}; Mostales, Joshua C. BS¹; Qin, Caroline Xu BS¹; Hadvani, Priyanka J. BS, MSc¹; Sirisegaram, Luxey BSc, MD, FRCPC¹; Bettick, Dianne MSN, CNS, RN¹; Gearhart, Susan L. MD, FACS, FASCRS, MEHP^{1,2}

¹Johns Hopkins University School of Medicine

Annals of Surgery: July 15, 2022

- Total group (n = 533)
GSV patients showed decreased risk of Loss of Independence, OR 0.26, p< 0.001 and major complications, OR 0.63, p< 0.001.
- Frail group alone (n = 154)
GSV patients showed a decreased risk for Loss of Independence, OR 0.30, p< 0.001, major complications, OR 0.31, p<0.001, and length of stay, OR 0.97, p< 0.001.

> [Ann Surg.](#) 2023 May 19. doi: 10.1097/SLA.0000000000005902. Online ahead of print.

Implementation of a Multi-specialty Geriatric Surgery Pathway Reduces Inpatient Cost for Frail Patients

April L Ehrlich ^{1 2}, Oluwafemi P Owodunni ³, Joshua C Mostales ¹, Jonthan Efron ^{3 4}, John Hundt ^{3 4}, Tom Magnuson ³, Susan L Gearhart ³

- Total (n = 460)
 - Pre GSP Cohort (295)
 - GSP Cohort (165)
- The total mean cost of health care services during hospitalization was significantly lower in the cohort in the geriatric surgery pathway (\$23,361 ± \$1110) as compared to the precohorts (\$25,452 ± \$1723), p< 0.001



VHA DIFFUSION OF EXCELLENCE

Surgical Pause Symposium



DUKE CENTER FOR GERIATRIC SURGERY

Committed to improving outcomes in older adults after surgery

Clinical: Perioperative Optimization of Senior Health (POSH) Clinic *Est: 2011*

Research: Perioperative Aging Research Infrastructure; DCGS Scholar's Program

Educational: Executive Leadership Immersion Training in Eldercare (ELITE)

Hospital Based Quality Program: Geriatric Surgery Verification (GSV) Program

Duke University Hospital
Duke Raleigh Hospital
Duke Regional Hospital
Durham VA HCS

Collaboration with Duke
Anesthesiology
(PASS Clinic)

Perioperative Optimization of Senior Health (POSH) Clinic

It Takes the Whole Team

- ADL/IADL
- Social support
- Gait speed
- Strength
- Cognition
- Mood
- Substance abuse
- Overall health goals
- Understanding of surgery
- Risk vs benefits
- Weight loss
- Muscle loss
- Access to food
- Detailed med review
- High risk meds
- IDT collaboration
- Transitions

Better outcomes

- Decreased length of stay
- Decreased readmissions
- Fewer complications
- Increased discharge to home with self care



American College of
Surgeons

AREAS of RESEARCH



Malnutrition and Postoperative Outcomes

Kathryn Starr
Shelley McDonald



Delirium Risk Evaluation and Management

Jeffrey Browndyle, Atilio Barbeito, Mitch Heflin



Perioperative Remote Patient Monitoring with Activity Trackers for Prehabilitation

Dan Blazer, Juliessa Pavon, Shelley McDonald, Sandhya Lagoo



Perioperative Risk Optimization with the Python Risk Calculator

Sandhya Lagoo, Hadiza Kazaure, Shelley McDonald, Mark Sendak, Suresh Balu



Biomarkers of Aging 1000 Patient project

Daniel Parker, Shelley Hwang, Sandhya Lagoo, Cathleen Colon-Emeric, Heather Whitson



Patient Reported Outcome Measures

Theresa Coles, Shelley McDonald



ncoa
National Council on Aging



Ingenuity



Concepts and ideas included in this frame element:

- Americans are problem-solvers. When we see an opportunity, we figure out how to seize it—and when something isn't working, we rethink our approach.
- Replacing outdated practices with new, smarter ways of doing things is the key to our nation's ingenuity.
- As Americans live longer and healthier lives, this presents new opportunities for our communities. It's up to us to figure out how to make the most of them.
- As Americans live longer lives, this also presents new problems. Fortunately, we have a long tradition of finding innovative solutions to challenges. As a nation of problem-solvers, we need to tap into our ingenuity to figure out better ways to [insert your issue/idea/solution].
- Let's try out new ideas and innovative approaches to improve how our society supports older people and responds to aging.



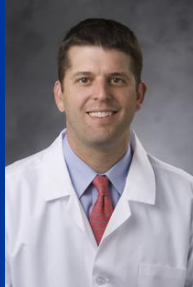
Organized around the peri-operative period
Care delivered by a multidisciplinary team
Providers will be part of an organizational unit
The team will take full responsibility for care of the patient
Patient education, engagement and follow up are integrated into care
The Unit will have a single administrative and scheduling structure
The team will measures outcomes, costs and processes



Matt Incovaia



Carrie Frede



Dan Blazer, III



Mamata Yanamadala



Shelley McDonald



Deni Kois



Hannah Barrett



Rebecca Schroeder



Marc Pepin



Jeffrey Browndyke



Susan Korucubasi



Mitch Heflin



Kathryn Porter Starr



Letha Joseph



Atilio Barbeito



Gail Bradley



DukeMedicine



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Surgical Pause Symposium



Translating Surgical Frailty Research into Federal Policy

Tej D. Azad MD, MS
CMS Fellow, Center for Clinical Standards & Quality
Centers for Medicare & Medicaid Services



Disclaimer

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This presentation is a general summary that explains certain aspects of the Medicare Program, but is not a legal document. The official Medicare Program provisions are contained in the relevant laws, regulations, and rulings. Medicare policy changes frequently, and links to the source documents have been provided within the document for your reference

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No financial conflicts to disclose



$$\text{Value} = \frac{\text{Quality}}{\text{Cost}}$$

$$\text{Value} = \frac{\text{Quality}}{\text{Cost}}$$

“The degree to which health services for individuals and populations *increase the likelihood of desired health outcomes* and are *consistent with current professional knowledge.*”

Institute of Medicine, NEJM 1990

Purpose of **quality** measures

To promote **quality** and
reduce waste in
healthcare

To improve
decision-making

Types of **quality** measures

Process	Aspirin on arrival for acute MI
Outcome	30-day mortality
Cost	Medicare spending per beneficiary
Patient-reported outcome	Change in functional status after knee replacement
Structural	Use of electronic health record

Anatomy of a **quality** measure

Quality Measure for Controlling High Blood Pressure

Patients with adequately controlled blood pressure.

Patients 18-85 years old with a high blood pressure diagnosis in the measurement period.

Any patients who are receiving hospice care; diagnosed or receiving certain treatments for kidney disease; pregnant (or were recently); >65 years old and living in certain types of special needs or long-term care facilities; age 66-80 with recent history of frailty and dementia medication or recent history of frailty and serious medical illness/treatment; or >80 years old with evidence of frailty.

% of patients (ages 18-85) with adequately controlled blood pressure

Developing a **quality** measure



CONCEPTUALIZATION



SPECIFICATION



TESTING



IMPLEMENTATION



EVALUATION

Developing a **quality** measure



What makes a good **quality** measure?

- **High priority** area of need
- Prioritizes outcomes in a **patient-centered** way
- Definitive **end goal** that the measure will improve
- **Specific** to intended use (facility versus clinician)
- Data is available and collection is **balanced with burden**
- **Improvement activities** are available to improve performance
- Measure allows **performance comparison** between groups

What happens after a measure is submitted?

Pre-Rulemaking Process

- 1 Measure developers submit their measures
- 2 CMS develops MUC List
- 3 Multi-stakeholder groups review
- 4 Multi-stakeholder groups make recommendations
- 5 Measures are proposed into Rulemaking

Federal Rulemaking

- **Proposed rules:** CMS writes the proposed rules and publishes them in the Federal Register.
 - A proposed rule is generally available for public comment for 60 days.
- **Final rules:** CMS considers the received comments and publishes the final rules in the Federal Register.

Taking a step back

Mission

To achieve optimal health and well-being for all individuals.

Vision

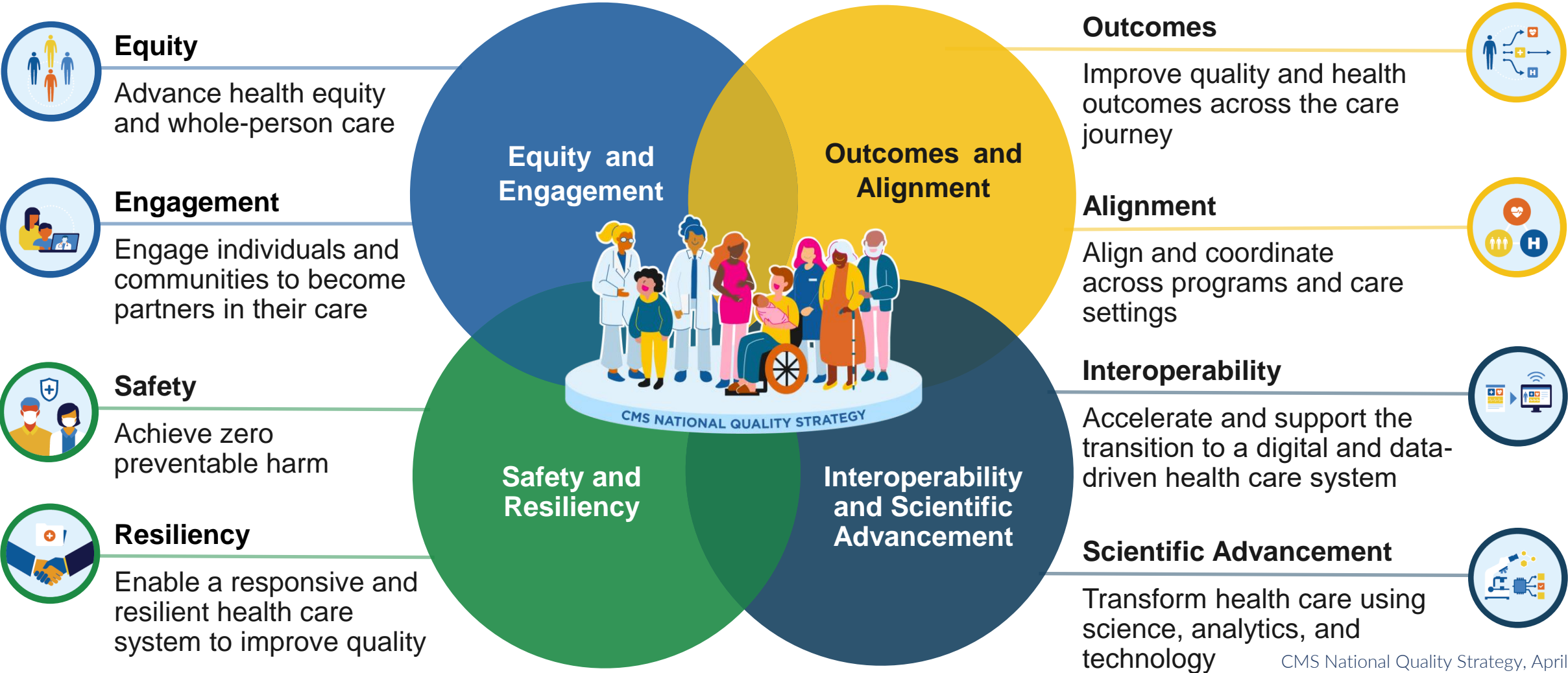
CMS, a trusted partner, is shaping a resilient, high-value American health care system that delivers high-quality, safe, and equitable care for all.



CMS National Quality Strategy, April 2023

CMS National Quality Strategy Goals

The Eight Goals of the CMS National Quality Strategy are Organized into Four Priority Areas:



CMS National Quality Strategy, April 2023

Thank you!

Tej D. Azad MD, MS

CMS Fellow, Center for Clinical Standards & Quality

Centers for Medicare & Medicaid Services





Surgical Pause Symposium



Surgical Pause: Taking it to the Nation

CMS Policy Levers

Shari M Ling, MD
Deputy Chief Medical Officer
Centers for Medicare & Medicaid Services

June 22, 2023



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Centers for Medicare and Medicaid Services (CMS)

- As the largest single purchaser of health care dollars, Medicare plays a key role in transitioning our health care system away from fee-for-service and towards value-based care.
- CMS is the largest purchaser of health care in the world
- CMS programs provide health care coverage to over 130 million people, or 1 of every 3 Americans
- In 2021, almost 64 million people are enrolled in Medicare, with nearly 75 million enrolled in Medicaid
- More than 12 million people are enrolled in both programs, and these individuals have very high rates of chronic illness; most with multiple chronic conditions
- Most Medicare beneficiaries - over 80% - are over age 65
- 55% of the Medicare beneficiaries are women
- Some people come into Medicare first, typically through age, and others become beneficiaries because of disability or other health status (e.g. renal disease)
- Beneficiaries with Medicaid or no supplemental coverage were more likely to be Black, covered by Medicare based on disability, and have functional limitations

[Medicare Beneficiary Enrollment Trends and Demographic Characteristics](#)



Vision: What's to Come Over the Next 10 Years



**A HEALTH SYSTEM THAT ACHIEVES EQUITABLE OUTCOMES
THROUGH HIGH QUALITY, AFFORDABLE, PERSON-CENTERED CARE**

**DRIVE
ACCOUNTABLE CARE**



**ADVANCE
HEALTH EQUITY**



**SUPPORT
INNOVATION**



**ADDRESS
AFFORDABILITY**



**PARTNER TO
ACHIEVE SYSTEM
TRANSFORMATION**



CMS Strategic Pillars

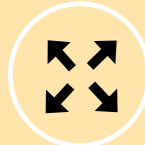
ADVANCE EQUITY

Advance health equity by addressing the health disparities that underlie our health system



EXPAND ACCESS

Build on the Affordable Care Act and expand access to quality, affordable health coverage and care



ENGAGE PARTNERS

Engage our partners and the communities we serve throughout the policymaking and implementation process



DRIVE INNOVATION

Drive Innovation to tackle our health system challenges and promote value-based, person-centered care



PROTECT PROGRAMS

Protect our programs' sustainability for future generations by serving as a responsible steward of public funds

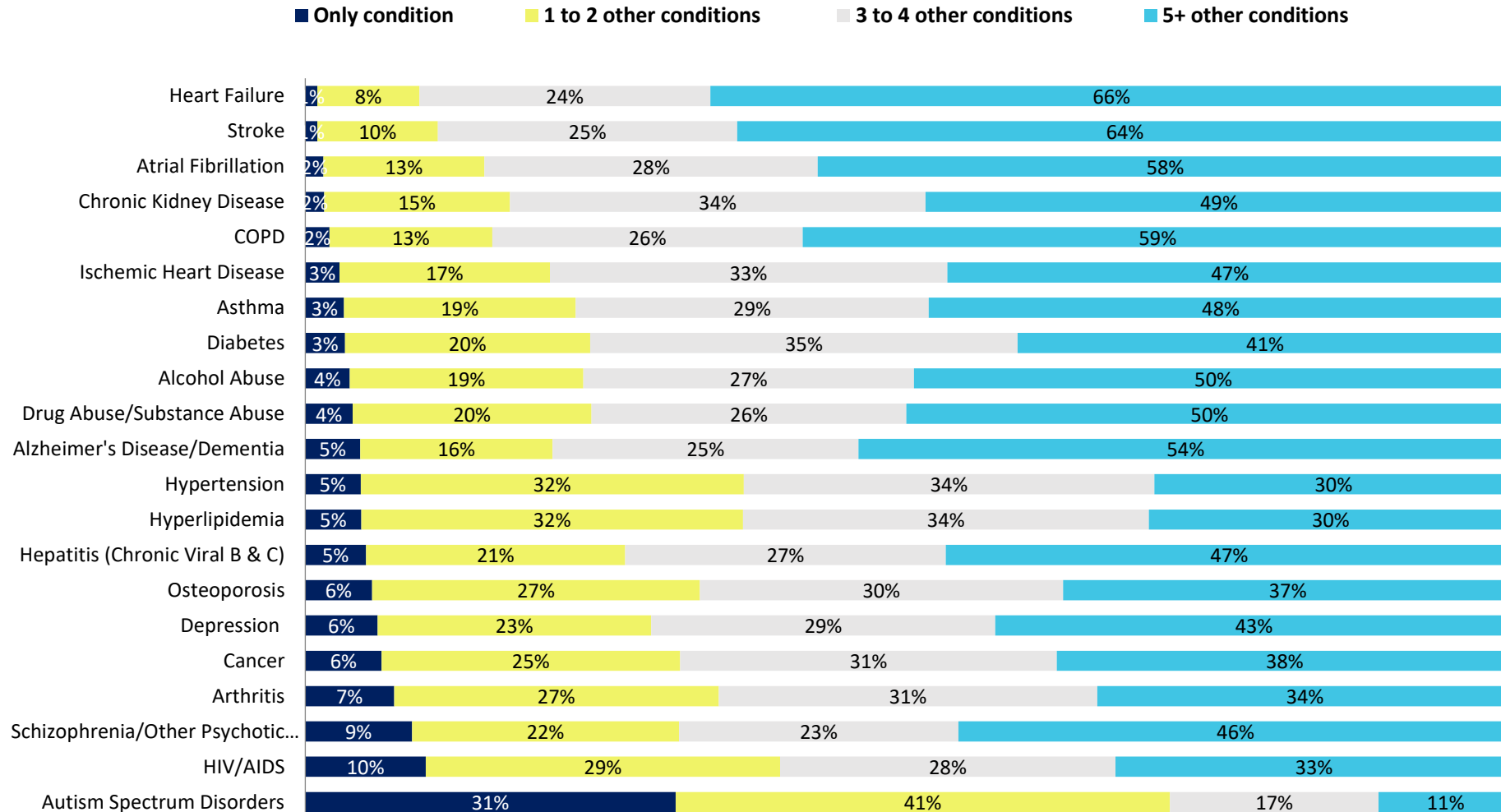


FOSTER EXCELLENCE

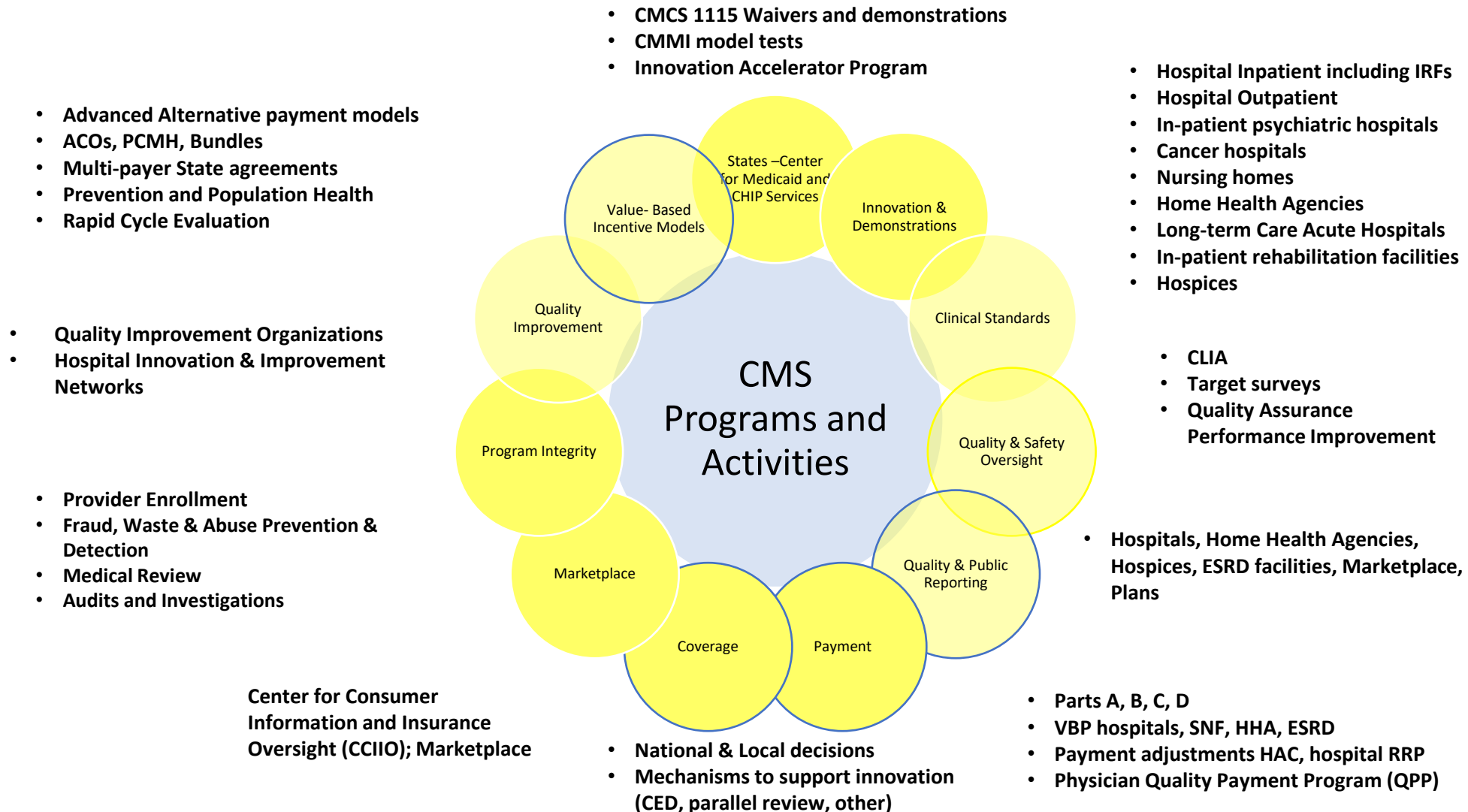
Foster a positive and inclusive workplace and workforce, and promote excellence in all aspects of CMS's operations



Percentage of Medicare FFS Beneficiaries with 21 Selected Chronic Conditions: 2021



Overall CMS Programs & Activities



How are we defining value in this strategy?

- Value **for all people with Medicare.**



CMS National Quality Strategy Goals



Embed Quality Across the Care Journey



Embrace the Digital Age



Advance Health Equity & Whole-Person Care



Strengthen Resilience in the Health Care System



Promote Safety to Achieve Zero Preventable Harm



Incentivize Scientific Innovation, Advanced Analytics & Technology



Foster Engagement to Improve Quality & Build Trust



Increase Alignment to Promote Seamless, Coordinated Services & Support

*Drivers of
change*

Assessment



Highest-Quality, Best-Value, and
Patient-Centered Care within a
Resilient System framework



Payment
Models



*Elevator: Quality
improvement*



Assessment: Quality measures

*Minimum for all
individuals*



Conditions of Participation

*Survey and
enforcement*

Promote Safety to Achieve Zero Preventable Harm



Strive toward a goal of
no preventable harm

- Commit to national goal of no preventable harm
- Encourage organizations to deeply embed, implement and sustain best practices of safety to create more durable and resilient safety systems
- Engage individuals in safety – reporting, review of their information, communication
- Support safety through CMS levers of Conditions of Participation, survey and certification, and quality improvement actions
- Partnerships: National Action Plan to Advance Patient Safety 2020 (IHI, AHRQ)

Medicare Coverage Construct: Social Security Act 1862(a)(1)

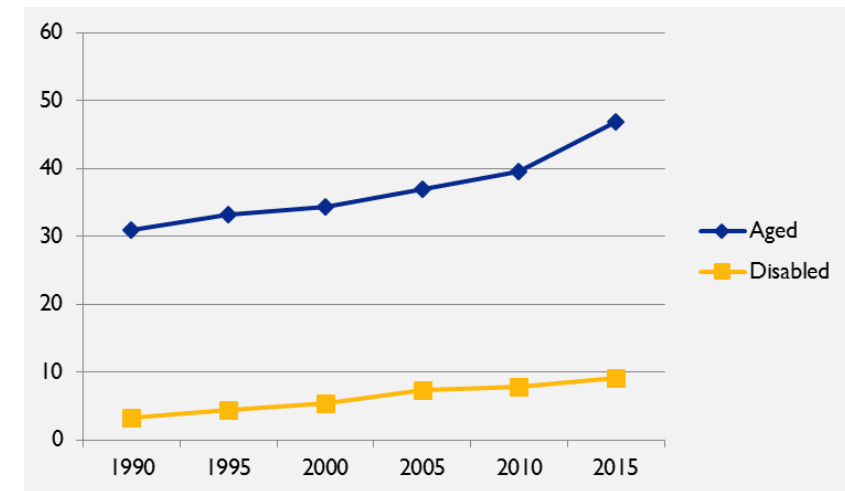
- Reasonable and Necessary

Notwithstanding any other provision of this title, no payment may be made under part A or part B for any expenses incurred for items or services -

- (A) which, ... are not reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member, ...
- (E) in the case of research conducted pursuant to §1142, which is not reasonable and necessary to carry out the purposes of that section, ...

- Defined Benefit Program

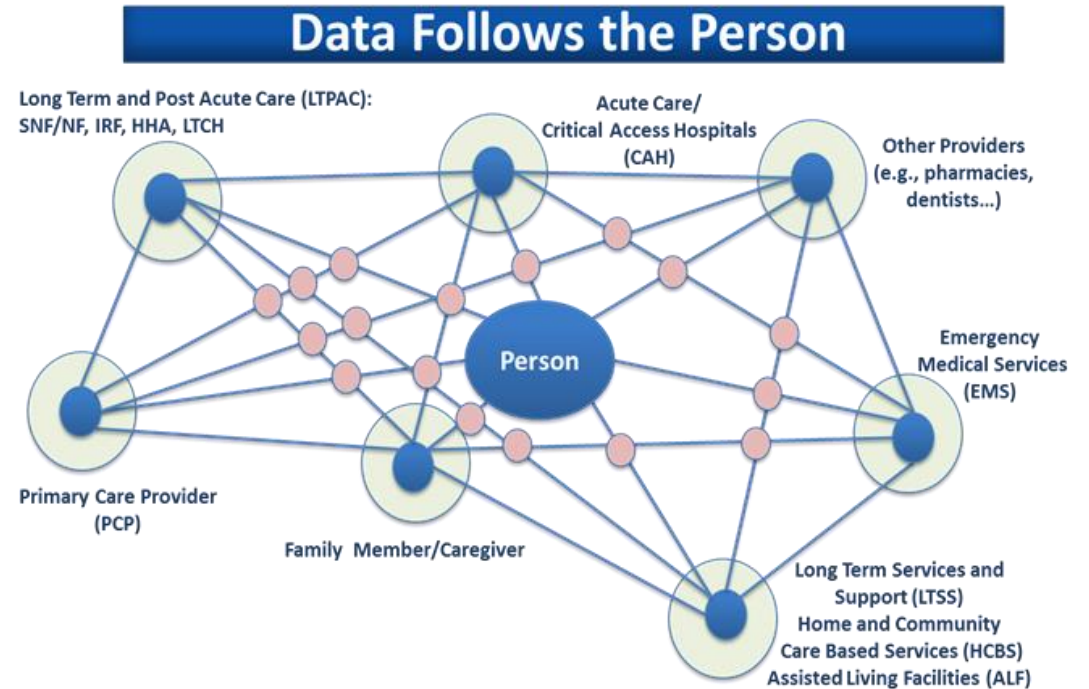
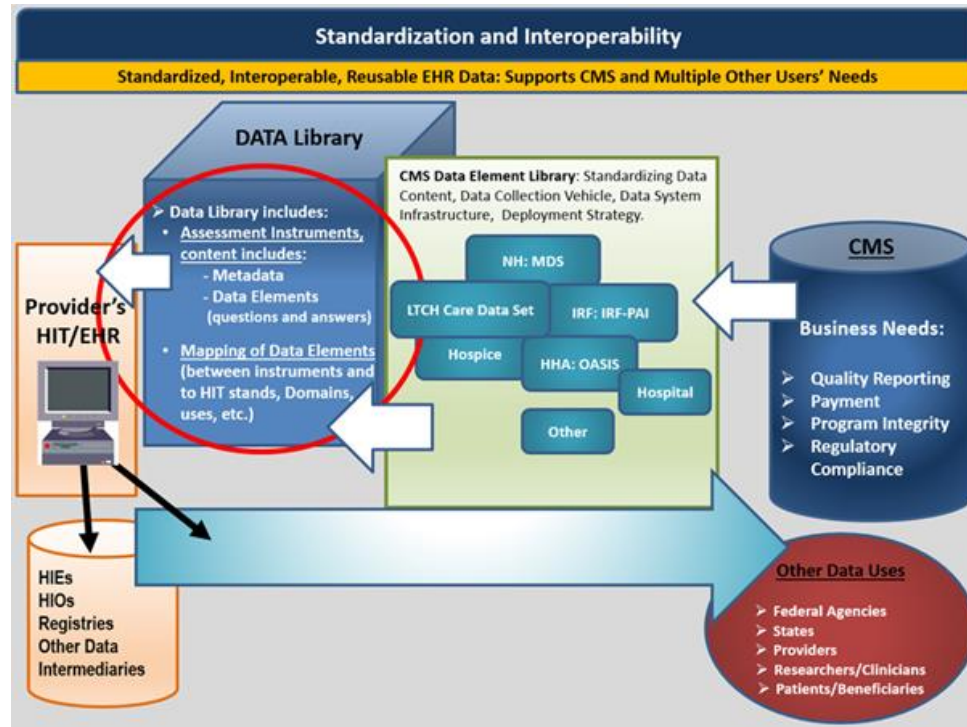
- Beneficiaries
 - Age ≥ 65 years
 - Disabled individuals
 - End stage renal disease
- Providers
- Settings



IMPACT Act Measure Domains

Measure Domain	Measure Name
Functional Status	Application of Percent of LTCH Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631)
Skin Integrity	Changes in Skin Integrity Post-Acute Care: Pressure Ulcer/Injury
Medication Reconciliation	Drug Regimen Review Conducted with Follow-Up for Identified Issues-Post Acute Care (PAC)
Incidence of Major Falls	Application of Percent of Residents Experiencing One or More Falls with Major Injury (Long Stay) (NQF #0674)
Transfer of Health Information	Transfer of Health Information to Provider – Post-Acute Care Transfer of Health Information to Patient – Post-Acute Care
Medicare Spending Per Beneficiary	Medicare Spending Per Beneficiary-Post Acute Care (PAC)
Discharge to Community	Discharge to Community-Post Acute Care (PAC)
Potentially Preventable Hospital Readmissions	Potentially Preventable 30-Day Post-Discharge Readmission Measure

The CMS Data Element Library: Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014



FUNCTION – MOBILITY, SELF-CARE, COGNITION, SYMPTOMS, CARE PLANS

[Data Element Library \(DEL\)](#)

Thank You!

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Centers for Medicare & Medicaid Services

