

# The Society of Thoracic Surgeons

Adult Cardiac Surgery Database

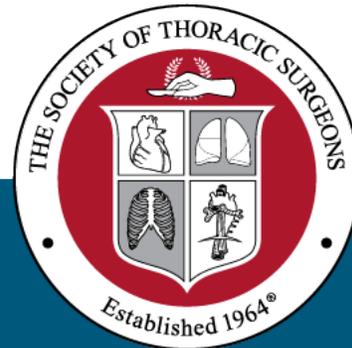
Quality Improvement Series Webinar

Deanna McIntire, PT, MHS

Marc Burkard, PT, CCS

University of Virginia Health

January 21, 2026



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# Agenda

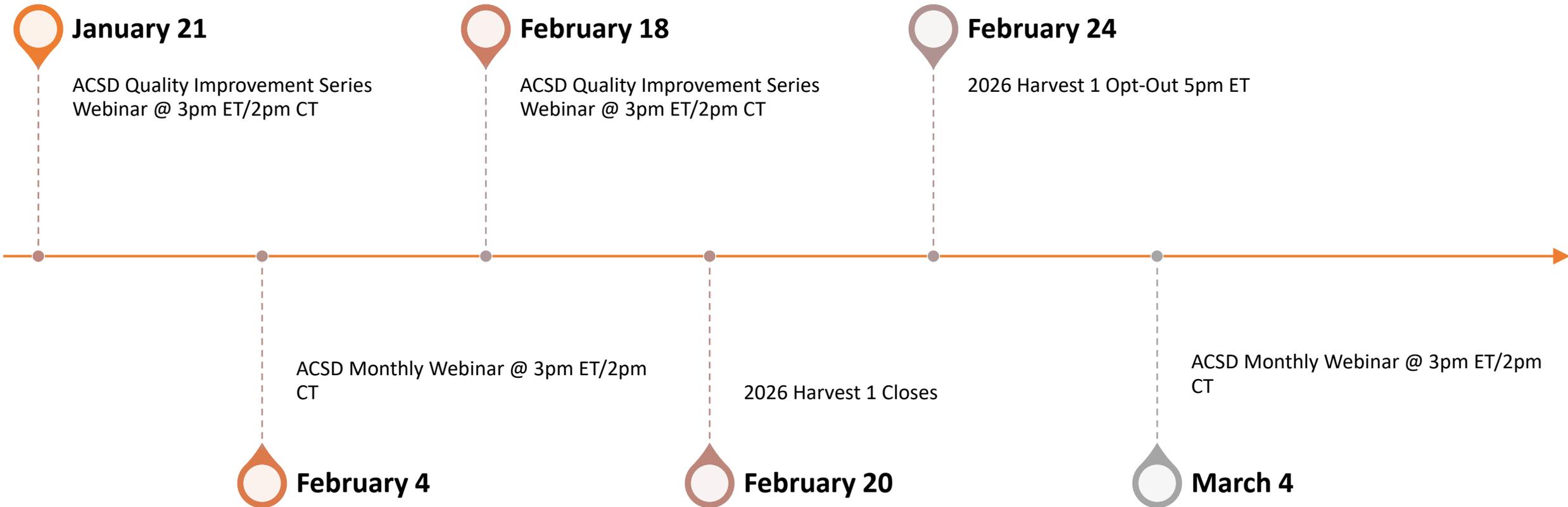
Welcome and Introductions

Brief STS Updates

Guest Speaker-Deanna McIntire, Marc Burkhard

Q&A

# Important Dates-Timeline



# Important Dates-2026 Harvest

## 2026 Harvest

Term	Harvest Submission Window Close	Opt-Out Date	Includes Procedures Performed Through:	Report Posting	Comments
Harvest 1	February 20	February 24	December 31, 2025	Spring 2026	Star Rating
Harvest 2	May 29	June 2	March 31, 2026	Summer 2026	
Harvest 3	August 28	September 1	June 30, 2026	Fall 2026	Star Rating
Harvest 4	November 20	November 24	September 30, 2026	Winter 2026/2027	

Analysis for each harvest is based on a 36-month window.

*Data Submission Open is continuous for all harvest terms. Submission Close occurs at 11:59 p.m. Eastern on the date listed.*

*Harvest Opt-Out closes at 5:00 p.m. Eastern on the date listed.*



# Data Clean Up

- Mortality Analysis includes the following variables: Status at Hospital Discharge, Status at 30 days After Surgery, Operative Mortality  
 - Outcomes and Process Measures Analysis includes the following variables: Internal Artery Mammery Used, Preoperative Beta Blocker, Discharge Anti-platelet, Discharge Beta Blocker, Discharge Anti-lipid

- In addition to meeting required data completeness thresholds, sites must meet the below case count requirements for the 36-month analytical window to be included into analysis.

CABG - 50 cases; AVR - 10 cases; AVR+CAB - 10 cases; MVRR - 36 cases; MVRR+CAB - 25 cases; Multiprocedural - 100 cases

- Color Code Legend

Red - Does not meet requirement for inclusion into composite ratings

Yellow - At risk of not meeting requirement for inclusion in composite ratings

Green - Meets requirement for inclusion into composite ratings

## Current Harvest Missing / Unknown % Composite Rating

### Current Harvest Missing / Unknown % Composite Rating

Main Category	Procedure	Year	#Missing	#Eligible	% Percent
Mortality Analysis	Isolated CABG	10/01/2022 - 09/30/2023	6	66	9.09
		10/01/2023 - 09/30/2024	0	0	0.00
		10/01/2024 - 09/30/2025	0	0	0.00
	Isolated AVR	10/01/2022 - 09/30/2023	0	2	0.00
		10/01/2023 - 09/30/2024	0	0	0.00

## Current Harvest Missing / Unknown % Composite Rating

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		10/01/2024 - 09/30/2025	0	0	0.00
	Isolated AVR	10/01/2022 - 09/30/2023	0	2	0.00
		10/01/2023 - 09/30/2024	0	0	0.00

### Case List

Category	Procedure Group	Surgery Year	Patient ID	Access Case
Mortality Analysis	Isolated CABG	2022	V3168624	<a href="https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/">https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/</a>
Mortality Analysis	Isolated CABG	2022	V3189346	<a href="https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/">https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/</a>
Mortality Analysis	Isolated CABG	2022	V3181730	<a href="https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/">https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/</a>
Mortality Analysis	Isolated CABG	2022	V3118794	<a href="https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/">https://sts.irp.iqvia.com/platform/acsdregistry/facility/1522/</a>



# Data Clean Up

## STS National Database Webinar Archive

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Access recordings of past webinars for data managers below or visit and subscribe to the [STS National Database YouTube channel](#).

### Adult Cardiac Surgery Database

Webinar	Date	Description
ACSD Monthly Webinar	February 5, 2025	ACSD Updates for 2025

ACSD Data Manager Training Webinar	March 20, 2025	Data Submission (Harvest), Data Quality Report (DQR)	<a href="#">Listen to recording</a>	<a href="#">View Slides</a>
ACSD Data Manager Training Webinar	March 25, 2025	National Report Analyses Overview, Process and Outcome Measures, STAR Ratings	<a href="#">Listen to recording</a>	<a href="#">View Slides</a>
ACSD Data Manager Training Webinar	April 1, 2025	Helpdesk Support	<a href="#">Listen to recording</a>	<a href="#">View Slides</a>
ACSD Monthly Webinar	April 2, 2025	Data Manager Survey	<a href="#">Listen to recording</a>	<a href="#">View Slides</a>
ACSD Data Manager Training Webinar	April 8, 2025	IQVIA Reporting	<a href="#">Listen to recording</a>	<a href="#">View Slides</a>
ACSD Quality Improvement Series	April 16, 2025	Translating cardiac surgery PBM guidelines into clinical practice: UVA experience, Dr. Karen Singh, UVA	<a href="#">Listen to recording</a>	<a href="#">View Slides</a>
ACSD Monthly Webinar	May 7, 2025	Preparing for Harvest	<a href="#">Listen to recording</a>	<a href="#">View Slides</a>



# AQO 2026 – New Orleans

- September 30-October 2, 2026
- Intermacs & Pedimacs-Live Virtual Forum-September 24th
- CHSD & GTSD Sessions will be held Sept 30<sup>th</sup> (full day) and October 1<sup>st</sup> (half day)
- ACSD Sessions will be held October 1<sup>st</sup> (full day) and October 2<sup>nd</sup> (half day)
- Half day sessions will include breakout sessions for the on-site databases

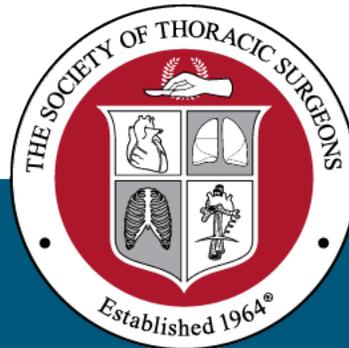


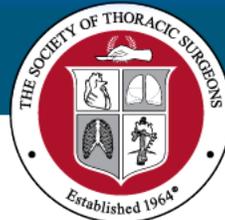
# “Prehab Power: Enhancing Surgical Success Through Frailty Assessment & Prehabilitation”

Deanna McIntire, PT, MHS

Marc Burkard, PT, CCS

University of Virginia Health





# Open Discussion

Please use the  
raise-hand  
function.

Please use the  
Q&A Function.

We will answer as  
many questions as  
possible.

We encourage  
your feedback and  
want to hear from  
you!

# Contact Information

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- [STSDb@sts.org](mailto:STSDb@sts.org)
  - Database Operational Questions (Billing, Contracts, Contacts)
- [STSDb\\_Helpdesk@sts.org](mailto:STSDb_Helpdesk@sts.org)
  - IQVIA/Database Platform Questions (Uploader, DQR, Missing Variable, Dashboard, Password and Login)
- [STSDb-FAQ@sts.org](mailto:STSDb-FAQ@sts.org)
  - Clinical Questions



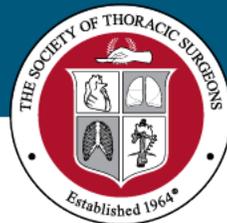
# We Need You!

If you or someone at your site have been successful in implementing a QI project to decrease postoperative renal failure, please reach out to Nancy Honeycutt @ [nhoneycutt@sts.org](mailto:nhoneycutt@sts.org).



# Thank You for Joining!

Reminder: Our next ACSD Monthly Webinar will be held on  
Wednesday, February 4, 2026 at 3pm ET/2pm CT.





# Prehab Power: Enhancing Surgical Success Through Frailty Assessment & Prehabilitation

# Disclosures

None

# Objectives

## 1. Establishing Physical Therapy in the Cardiac Surgery Clinic:

Understand the process and steps involved in proposing and gaining approval for a physical therapy position within the cardiac surgery clinic.

**2. Defining the Clinical Physical Therapy Role:** Understand the physical therapist's expertise in assessing frailty, identifying prehabilitation candidates, enhancing perioperative care, and predicting postoperative needs to enhance traditional surgical risk stratification. w

# Objectives

**3. Comprehension of Frailty's Impact in Cardiac Surgery:** Gain knowledge in measuring frailty and interpreting scores. Develop strategies to optimize care of cardiac surgery candidates based on preoperative frailty assessments.

**4. Gain insight into the development and implementation of a PT prehabilitation program to improve frailty of cardiac surgery candidates in the cardiac rehab setting:** Justify why this setting is ideal for selected cardiac surgery candidates ensuring safety, enhancing exercise compliance, and improving participation in postoperative cardiac rehabilitation.

# Physical Therapy Role in Prehabilitation

**2017 Proposal for “Prehab” PT**

**2018 PT role integrated into the Clinic Team**

Prepare patients to optimize functional gains prior to surgery

Discuss discharge planning and recommendations

Sets expectations, diffuse anxiety

Provide reassurance and reinforcement

# Physical Therapy Role in Prehabilitation

**Enhancing Risk Stratification:** Provides objective functional and frailty assessment to augment the current surgical risk model

## **Providing Real-Time Recommendations to Surgical Team:**

- **Optimization:** Option to delay surgery for **Prehabilitation (Prehab)** to boost patient reserve.
- **Surgical Review:** Discuss less invasive surgical approaches or medical management based on frailty score.
- **Resource Planning:** Proactively plan for high post-op support/rehab needs if surgery delay is not feasible.

# Cardiac Prehab Education and Exercises

- Educate on sternal precautions and fitting/instruction in use of sternal support device
- Review mobility strategies to maximize functional independence while protecting sternotomy
- Review fall reduction strategies and home safety checklist
- Review energy conservation strategies
- Review strategies for managing dyspnea and shortness of breath
- Address any comorbidities impactful on functional mobility

# Frailty Tests used in Cardiac Surgery Clinic

**Fried Frailty:** already established in our EMR

0-5, higher is more frail

**Essential Frailty Toolset (EFT):** valve team requested for TAVRs

0-5, higher is more frail

**Short Physical Performance Battery (SPPB):** added balance test, objective (0-12) higher is more robust

# Fried Frailty Index (FFI)

**Risk Factors:** Activity tolerance

Exhaustion

Gait speed (15 ft)

Grip strength

Unintentional weight loss

**Scores:** 0-5

Robust: 0

Prefrail: 1-2

Frail: 3-5

The more positive risk factors for frailty, the higher the risk for adverse outcomes such as falls, disability, hospitalization, and mortality



# Essential Frailty Toolset (EFT)

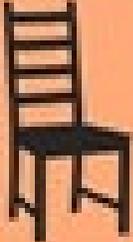
The EFT is scored 0 (least frail) to 5 (most frail) based on the following 4 items:

Five times sit to stand

Minicog screen (MMSE)

Hemoglobin

Serum albumin

	Five chair rises <15 seconds	0 Points
	Five chair rises ≥15 seconds	1 Point
	Unable to complete	2 Points
	No cognitive impairment	0 Points
	Cognitive impairment	1 Point
	Hemoglobin ≥13.0 g/dL (M) or ≥12.0 g/dL (F)	0 Points
	Hemoglobin <13.0 g/dL (M) or <12.0 g/dL (F)	1 Point
	Serum albumin ≥3.5 g/dL	0 Points
	Serum albumin <3.5 g/dL	1 Point

# Short Physical Performance Battery (SPPB)

Objective assessment tool for evaluating lower extremity function through objective balance, strength, and gait measurements

- **Static balance test:** 10 sec intervals of:  
Side by side stand , semi-tandem stand , tandem stand
- **Repeated chair test:** 5 times sit to stand without arms
- **4 Meter walk test:** without acceleration in seconds, best of 2 trials

These areas represent essential tasks important for independent living.

# Short Physical Performance Battery (SPPB)

Validated to assess physical function and to predict disability and all-cause mortality in community dwelling elderly

Predicts adverse outcomes such as decreased mobility, falls, loss of independence in ADL, hospitalization, length of hospital stay, nursing home admission, and all-cause mortality.



Ramírez-Vélez R, López Sáez de Asteasu M, Morley JE, Cano-Gutierrez CA, Izquierdo M. Performance of the Short Physical Performance Battery in Identifying the Frailty Phenotype and Predicting Geriatric Syndromes in Community-Dwelling Elderly. *J Nutr Health Aging*. 2021;25(2):209-217.

# SPPB Scoring

- $\leq 7$  indicates frailty
- Classification of Limitations based on SPPB
- 0-3 severe limitations
- 4-6 moderate limitations
- 7-9 mild limitations
- 10-12 minimal limitations

# Comparison of Frailty Scoring

	<b>Robust</b>	<b>Prefrail</b>	<b>Frail</b>
<b>Fried Frailty Index (FFI)</b>	<b>0</b>	<b>1-2</b>	<b>3-5</b>
<b>Essential Frailty Toolset (EFT)</b>	<b>0</b>	<b>1-2</b>	<b>3-5</b>
<b>Short Physical Performance Battery (SPPB)</b>	<b>10-12</b>	<b>7-9</b>	<b>0-6</b>

Pritchard, J.M., Kennedy, C.C., Karampatos, S. et al. Measuring frailty in clinical practice: a comparison of physical frailty assessment methods in a geriatric out-patient clinic. BMC Geriatr 17, 264 (2017).

Ramírez-Vélez R, López Sáez de Asteasu M, Morley JE, Cano-Gutierrez CA, Izquierdo M. Performance of the Short Physical Performance Battery in Identifying the Frailty Phenotype and Predicting Geriatric Syndromes in Community-Dwelling Elderly. J Nutr Health Aging. 2021;25(2):209-217.

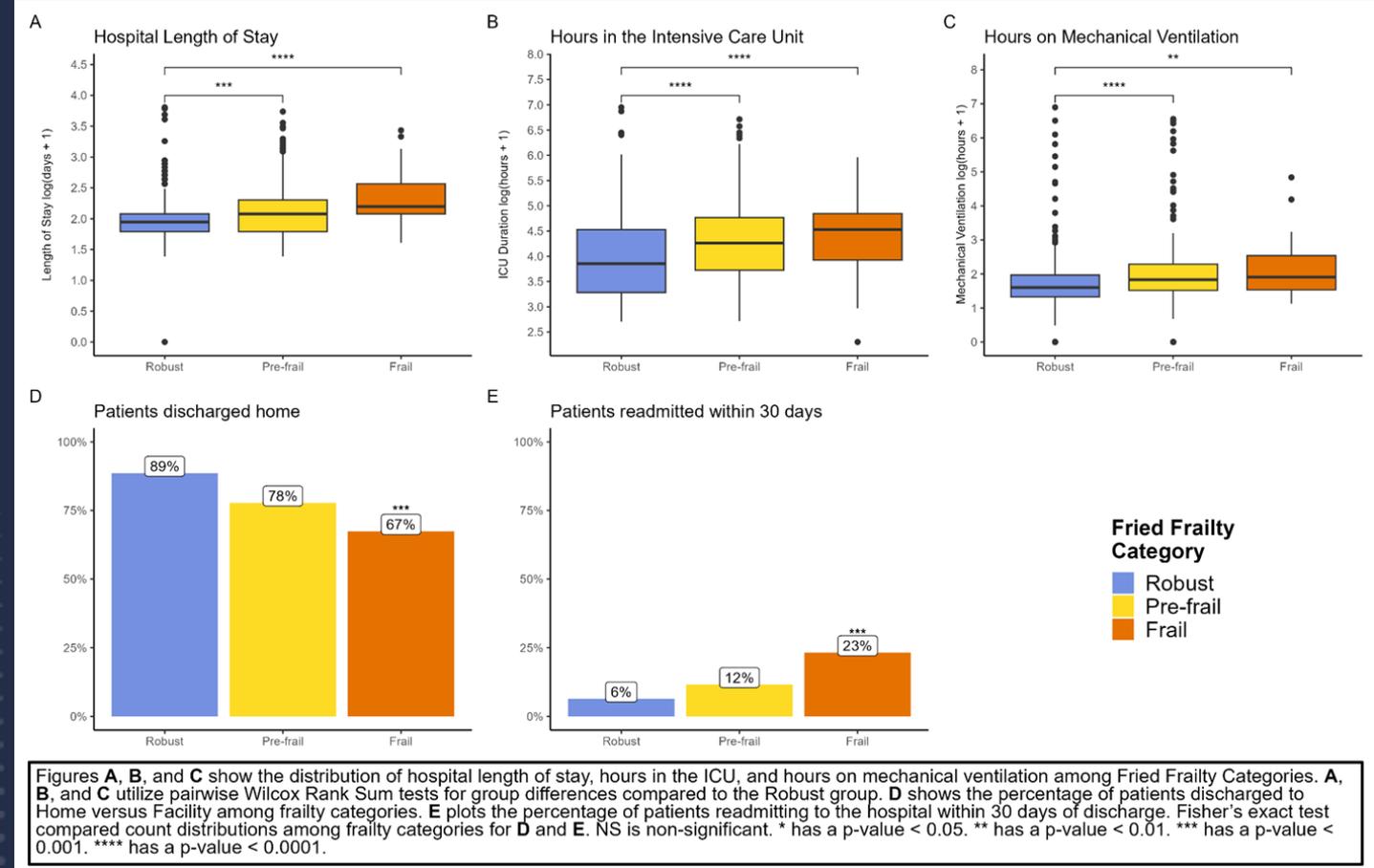
# Physical Therapy(Prehabilitation)

2019-2020

Compared pre op frailty data to post op outcomes of 541 cardiac surgery patients

Pre-op frailty testing can identify patients who utilize more postop resources

Background evidence to support the development of the UVA Prehabilitation Program



2022 UVA Prehabilitation Program was launched in the Cardiac Rehab Setting



# Preoperative Frailty increases healthcare resource consumption

Fried Frailty Group	Frail (3-5)	PreFrail(1-2)	Robust (0)	Total	P value
2019-2020	n=43	n=257	n=241	n=541	
LOS (days) Median (Q1, Q3)	8.0 (7.0, 12.0)	7.0 (5.0, 9.0)	6.0 (5.0, 7.0)	6.0 (5.0, 9.0)	<0.001
Total ICU Hours Median (Q1, Q3)	91.70 (49.70, 126.35)	69.80 (40.40, 116.50)	46.15 (25.70, 91.69)	54.22 (28.00, 101.05)	<0.001
Total Vent Hours Median (Q1, Q3)	5.72 (3.65, 11.85)	5.25 (3.57, 8.77)	3.97 (2.78, 7.52)	4.62 (3.20, 7.52)	<0.001

# Preoperative Frailty increases healthcare resource consumption

Fried Frailty Group	Frail (3-5)	PreFrail(1-2)	Robust (0)	Total	P value
2019-2020	n=43	n=257	n=241	n=541	
DC to Facility	14 (32.6%)	56 (22.2%)	27 (11.4%)	97 (18.2%)	<0.001
DC Home	29 (67.4%)	196 (77.8 %)	210 (88.6%)	435 (81.8%)	<0.001
Readmitted in 30 days	10 23.3%	29 11.6%	15 6.4%	54 10.3%	0.002

# Impact of Frailty on Cardiac Surgery Outcomes

Preoperative frailty testing can identify patients who utilize more postoperative resources after elective cardiothoracic surgery

Identifying patients that would benefit from a prehabilitation program to improve preoperative frailty status and guide perioperative planning can save hospital resources and improve postoperative outcomes

Physical therapists have the expertise to measure frailty and develop prehabilitation programs for this population

# Reflection: PT Role/Expertise

- Guided patient and surgical team /“outside of the box” problem solving for sternal precaution compliance
- Established trust and confidence from patient and surgical team
- Set realistic expectations/tailored pre, peri, and post op care
- Successful surgical outcome with challenging baseline mobility
- Anticipate alternative exercise strategies given baseline deficits for transition home and participation in cardiac rehab

# Physical Therapy Expertise

Enhancing Patient Experience through Custom Solutions

**High-Risk Compliance Management:** PT provides specialized guidance for complex patients to promote optimal recovery and sternal precaution compliance.

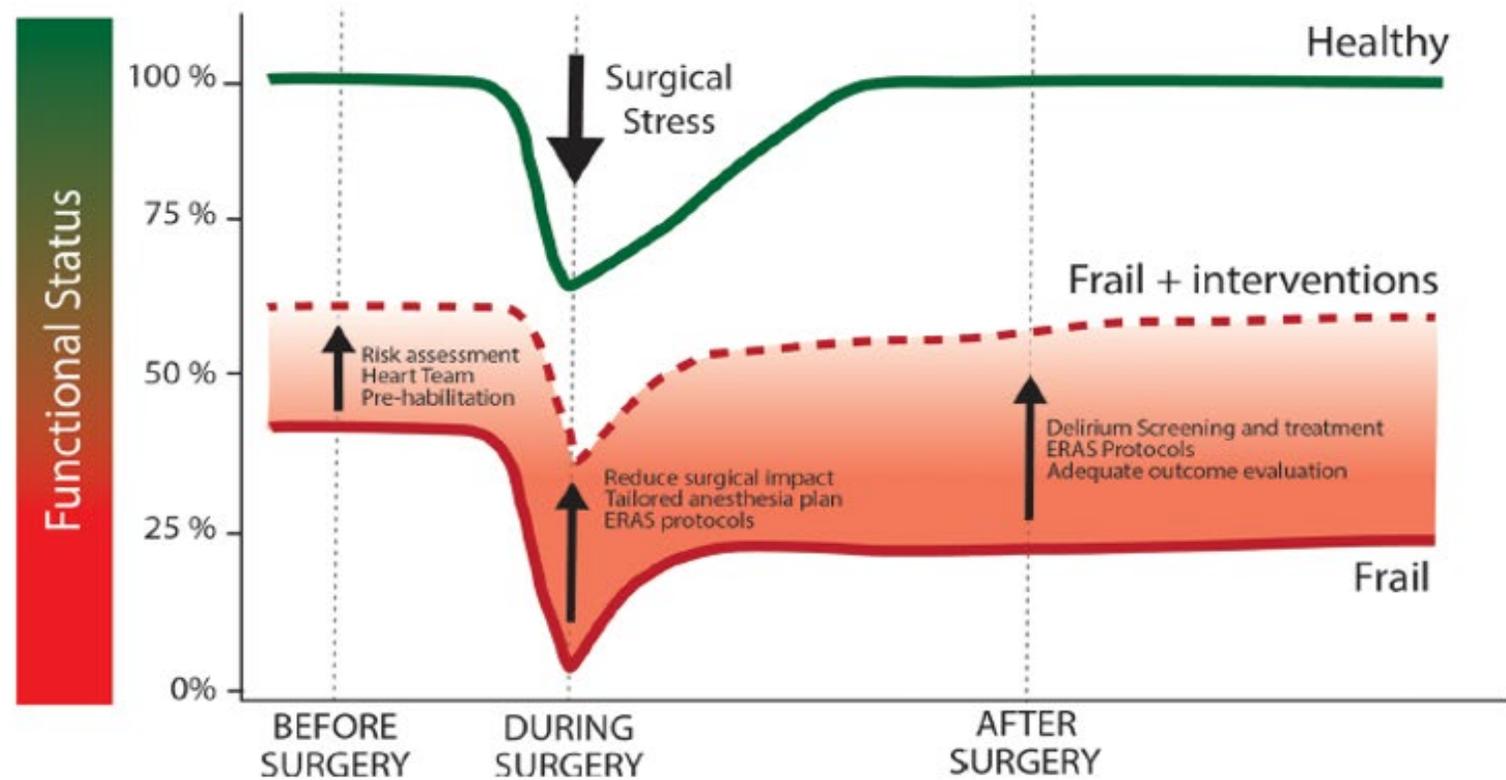
**Equipment/Design Advocacy:** Collaborated with vendor to design and modify sternal support devices (Sternasafe and Sternabra) to accommodate all patient body types.

**Standardized Education & Consensus:** Standardized sternal precaution education across the surgical team (EBP review, surgeon faculty presentation/discussion, updated all educational documents and provided staff training)



# What is PREHAB?

PREHAB (Pre-habilitation) is a form of rehabilitation that takes place before a medical or surgical intervention with the aim to reduce side effects/complications and enhance recovery.



**FIGURE 1**

Effect of surgical stress and optimization measures above functional status trajectories in healthy and frail patients. Following the stress of cardiac surgery healthy individuals (green line) suffer from an acute worsening of functional status, that promptly return to baseline during post-operative period. Frail individuals (red line) are characterized by a compromised baseline functional capacity. Similarly to healthy individuals, functional capacity is further reduced after surgery. As frail patients are not able to face such stressing factor, they could not be able to return to baseline functional capacity during post-operative period. This circumstance can compromise long-term outcome and ultimately the net result of the surgical procedure. Functional capacity trajectory could be modified by pre-operative, intra-operative and post-operative specific intervention (dashed red line), whose aim is to improve baseline conditions and to reduce the stressful burden of cardiac surgery.

# What types of patients benefit?

Patients who are FRAIL or PRE-FRAIL

Frailty: vulnerability to stressors due to loss of physiological reserve

# Inclusion criteria

Cardiovascular pre-surgical patients (CABG and/or valve surgery)

classified as Frail or Pre-Frail

Medically/clinically stable

Non-emergent surgery (not planned within the next 6 weeks)

Patient must be ambulatory\*

Cognitively dependable & able to follow commands

Able to participate 2x/week at Cardiac & Pulmonary Rehabilitation facility

Does not have any contraindications to participating

# Contraindications

Unstable angina

Resting systolic BP >180 mm Hg and/or resting diastolic BP >110 mm Hg

Orthostatic BP drop >20 mm Hg with symptoms

Significant aortic stenosis (aortic valve area <1.0 cm<sup>2</sup>)\*

Uncontrolled atrial or ventricular arrhythmias

Uncontrolled sinus tachycardia (>120 beats/min)

Uncompensated heart failure

Third degree AV heart block (without pacemaker)

Acute pericarditis or myocarditis

Recent embolism (pulmonary or systemic)

Acute thrombophlebitis

Aortic dissection

Acute systemic illness or fever

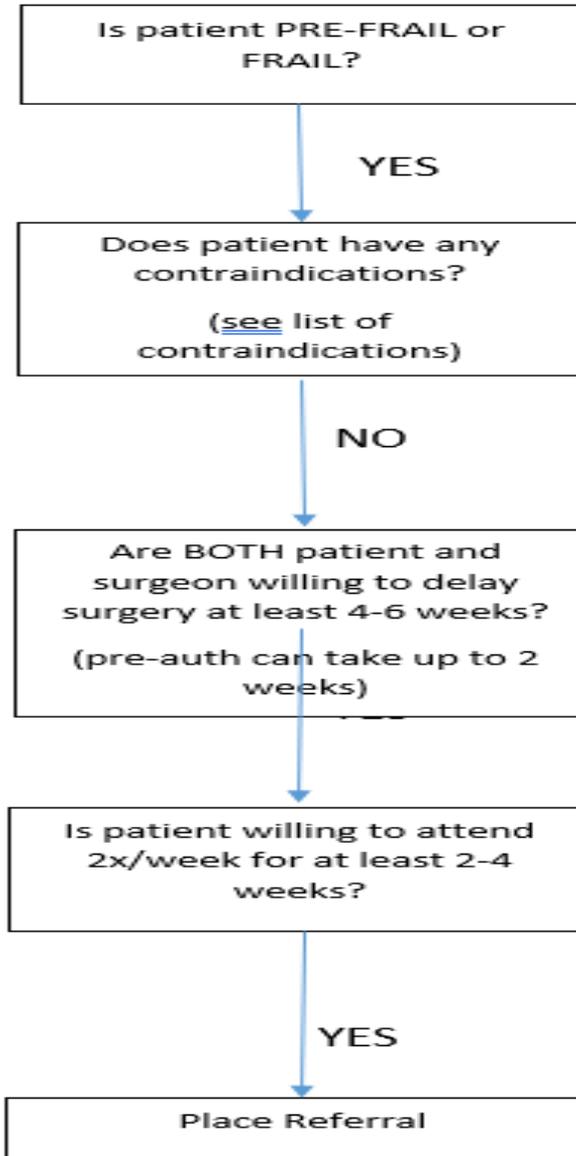
Uncontrolled diabetes (resting blood glucose >300 mg/dL)

Severe orthopedic limitations

Uncontrolled metabolic issues

Severe psychological disorder

## Decision Tree for Prehab



# Details of the PREHAB program

Multidisciplinary team: MD/NP/PA-C, PT, RD, SW, RN

1.5-2 hour initial evaluation

45-60 minute treatment sessions; 2-4x/week; 2-8 weeks

# Frailty functional domains

Physical  
Cognitive  
Nutritional  
Psychosocial

# How is physical frailty assessed?

**5-Meter Gait Speed**

**6-Minute Walk Test**

**Fried Frailty Index**

**EFT (Essential Frailty Toolset)**

**SPPB (Short Physical Performance Battery)**

# How is physical frailty assessed?

Study of Osteoporotic Fracture (SOF) Frailty Measure

Deficit Accumulation Index (DAI) (a.k.a. Frailty Index)

Edmonton Frail Scale (EFS)

FRAIL Scale

Clinical Frailty Scale

# How is cognitive frailty assessed?

**Mini-Cog TM**

**Mini Mental State Exam**

**Montreal Cognitive Assessment**

# How is nutritional frailty assessed?

Mini Nutritional Assessment

Geriatric Nutritional Risk Index

**Serum Albumin Levels**

Nutritional Risk Screening (NRS)

Nutritional Risk Indicator (NRI)

# How is psychosocial frailty assessed?

Hospital Anxiety and Depression Scale (HADS)

Generalized Anxiety Disorder (GAD-7)

**Patient Health Questionnaire (PHQ-9)**

Beck Depression Inventory (BDI)

Short Form 36 (SF-36)

# Components of the PREHAB program

## Aerobic exercise

5-10 minute warm-up and cool-down

Intensity: 40-60/70% of THRR; RPE 3-4/10; resting HR + 20 bpm

Duration: can start with 10-30 minutes with goal of 30 minutes of continuous activity

Intensity	%HRR	RPE Scale (6-20)	RPE Scale (1-10)	METs
LIGHT	30-39%	9-11 Very light- fairly light	1-3 Very light- fairly light	2.0-2.9
MODERATE	40-59%	12-13 Fairly light- somewhat hard	3-4 Fairly light- somewhat hard	3.0-5.9
VIGOROUS	60-89%	14-17 Somewhat hard-very hard	5-7 Somewhat hard-very hard	6.0-8.7

# Components of the PREHAB program

## Strengthening

Start with 1 set of 10-12 reps;  
gradually increase to 2 sets of 12-  
15 reps (18)

Use resistance bands/ handheld  
weights and some body weight  
exercises

## Stretching

Perform 2x and held for a  
minimum of 20 seconds (18)  
Chest, biceps, triceps, quadriceps,  
hamstring, calf (18)

## Inspiratory Muscle Training (IMT)

Protocols for strengthening and  
endurance

Recommended to have patients train in  
different positions:  
Supine, sit, stand, walking

## Balance exercises

## Relaxation techniques/mental stress reduction

# Components of the PREHAB program

## Patient Education:

risk factor reduction  
fall reduction strategies  
post-op course  
medication use (RN)  
cardiovascular physiology  
pre-op nutrition (RD)  
promotion of self-managed care

preparing home for discharge  
precautions  
discharge planning  
energy conservation  
smoking cessation (SW, RN)  
stress management (SW)

# When to terminate exercise

DBP  $\geq$ 110 mm Hg

Decrease in SBP  $>$ 10 mm Hg during exercise with increasing workload

Significant ventricular or atrial arrhythmias with or without associated signs/symptoms

Second- or third-degree heart block

Signs/symptoms of exercise intolerance including angina, marked dyspnea, and ECG changes suggestive of ischemia

# First Prehab Patient Pre op Testing

Seen from 1/31/23 until 6/27/23 for a total of 26 visits

Up to 2x/week for a 45-60 minute session

	4/18/2022 (CV clinic)	1/31/23 (Prehab)	6/27/23 (Prehab)	7/3/23 (CV clinic)
Fried Frailty Index (higher is more frail)	3/5	3/5	1/5	1/5
5M walk test	10.02 sec	9.04 sec	6.83 sec	6.12 sec
5x sit to stand	31.7 sec	18.7 sec	10.7 sec	10.1 sec
Grip strength	32 kg	27.7 kg	31.3 kg	36 kg
Essential Frailty Toolset (higher is more frail)	2/5	2/5	1/5	Pending recent labs
Short Physical Performance Battery (higher is more robust)	4/12	7/12	11/12	11/12
6 Minute Walk Test		171 m	221 m	

# First Prehab Patient

PHQ-9 Results:

1/31/23: 18

6/27/23: 16

# First Prehab Patient's' Post op Outcomes

## MVR sternotomy approach on 8/12/23

Vent hours 3.23 hours and **NOT** reintubated

ICU hours 97.07 hours (due to bed issue)

Did **NOT** need to go back to ICU

No STS post-op complications

No surgical site infections

D/C to home with home health on POD 10 (pt was ready for D/C on POD 5 but had to wait for INR to be therapeutic)

**NOT** readmitted within 30 days of D/C

Participated in our Cardiac Rehab Program

# Questions?

# Thank you!!

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