

Functional and Cognitive Assessments in the Perioperative Space: Lessons learned

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Acknowledgements

- NIH/NIA
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- Carol and George Abramson Fund for Aging and Longevity
- I-CARE
 - Implementation science methodologies to inform chronic disease advocacy, research and education



An anesthesiologist's perspective

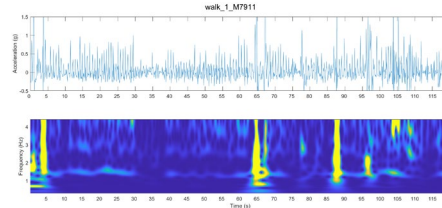
- Perioperative Medicine Clinic
- Don't have the surgeon-patient relationship
- Access to a variety of patient populations

At-home walking cadence before major abdominal surgery



2-minute walk tests

- Usual Pace
- Fast Pace



Accelerometer analysis

- Raw data



Cadence
83 steps/min

1. Accuracy and usability of a smartphone application to measure walking cadence
2. Association between walking cadence and commonly used functional measures before surgery
3. Investigate recovery of walking cadence **after** surgery

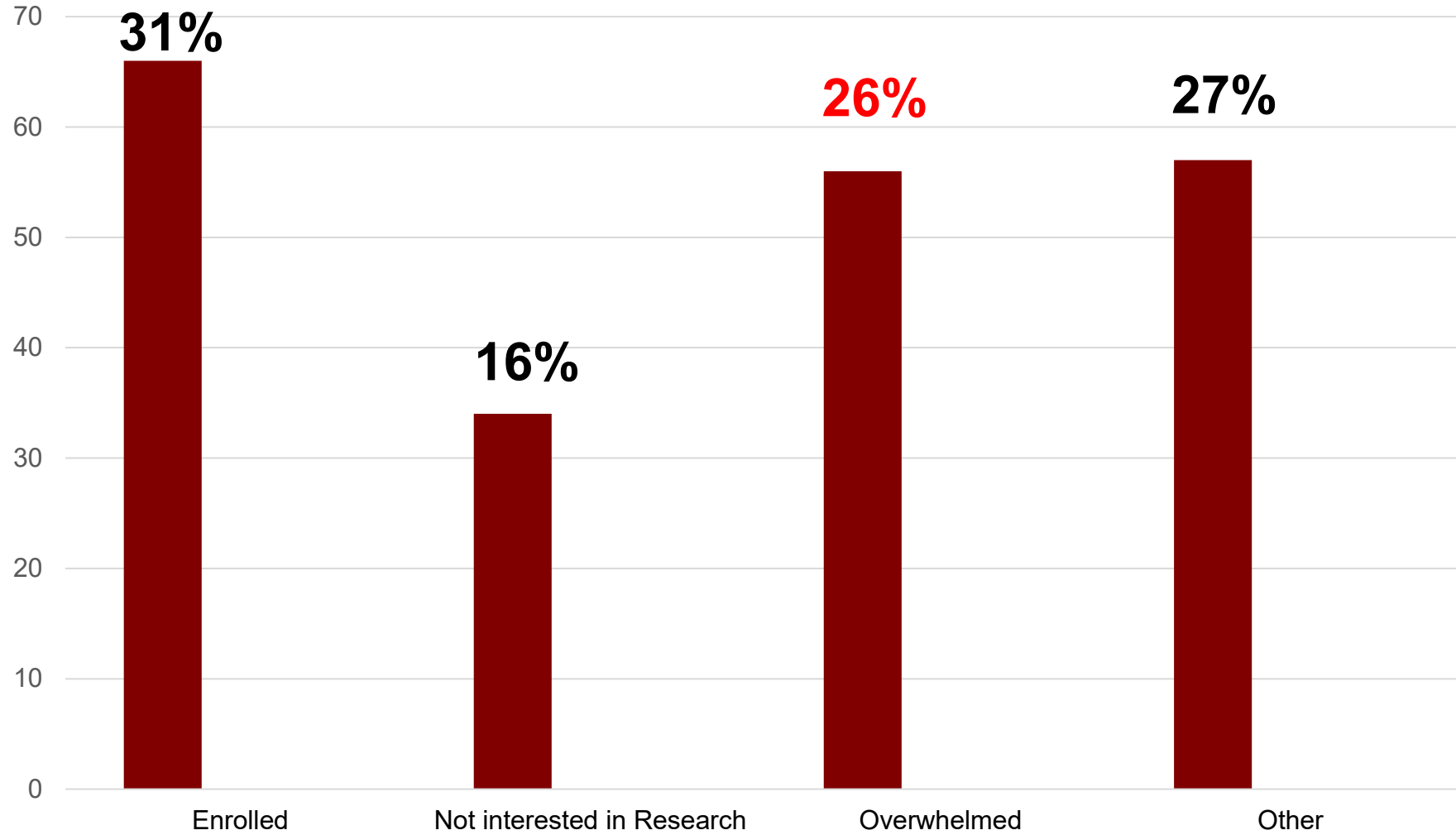
We built a de-novo performance assessment application



Assessments we included in our study

- Self Report
 - Duke Activity Status Index
 - Activities of Daily Living (ADL/iADL)
 - WHO Disability Assessment Schedule 2.0 (WHODAS)
 - PROMIS Global Health
 - PROMIS Pain
- Performance assessments
 - Fried Frailty Phenotype
 - Short Physical Performance Battery (SPPB)
 - Mini-Cog
 - Walk Tests (2-minute usual and fast pace)
 - At-home and In-Clinic
- Passive Monitoring
 - ActiGraph accelerometer (7-day wear period)

Older adults are overwhelmed before surgery (n=216)



Recruitment and follow-up assessments are challenging

- Recruitment: Where can I recruit surgical patients?
 - Anesthesia and Perioperative Medicine Clinic
 - Surgical Clinic
 - “Ms. X said no because she was **very against coming to the hospital solely for research.**”
- Standardized Follow-up: When can I schedule follow-up assessments?
 - Do I need to bring them in again before surgery? Morning of?
 - Do I need to bring in patients after surgery for performance assessments?
- Are they in-person or telehealth visits?
 - Functional assessments affected by mode of administration (Age and Aging 2023;8:52)
 - Cognitive assessments less/not affected by administration mode (JAGS 2023;71:1931-1936)

Order your functional assessments with your patient in mind

- Fried Frailty Phenotype
 - Gait Speed
 - Grip strength
 - Exhaustion
 - Low Physical Activity
 - Weight Loss
- SPPB:
 - Berg Balance
 - 5 time sit to stand
 - Gait Speed
- 2-minute walk tests
 - Usual and Fast pace
- Min-Cog Assessment

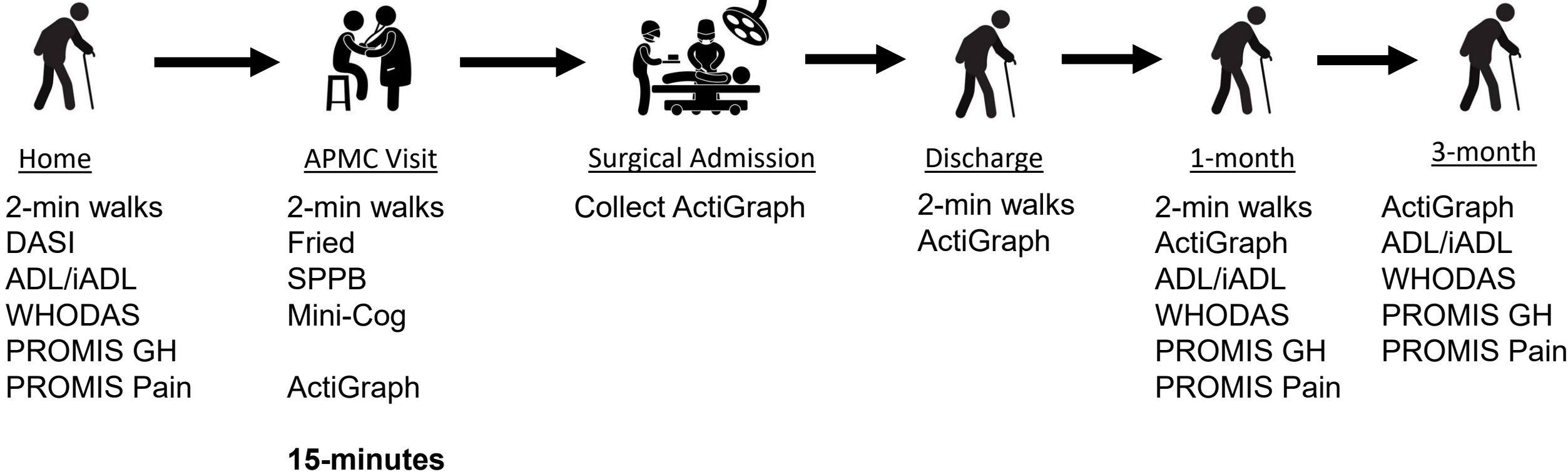
<u>Sitting:</u>	<u>Active Sitting</u>	<u>Standing</u>	<u>Walking</u>	<u>2-minute Walking</u>
Exhaustion	Grip Strength	Berg Balance	Gait-Speed	Usual Pace
Low PA	5-sit to stand			Fast Pace
Weight Loss				
Mini-Cog				



Patients don't have a lot of time when they visit clinic

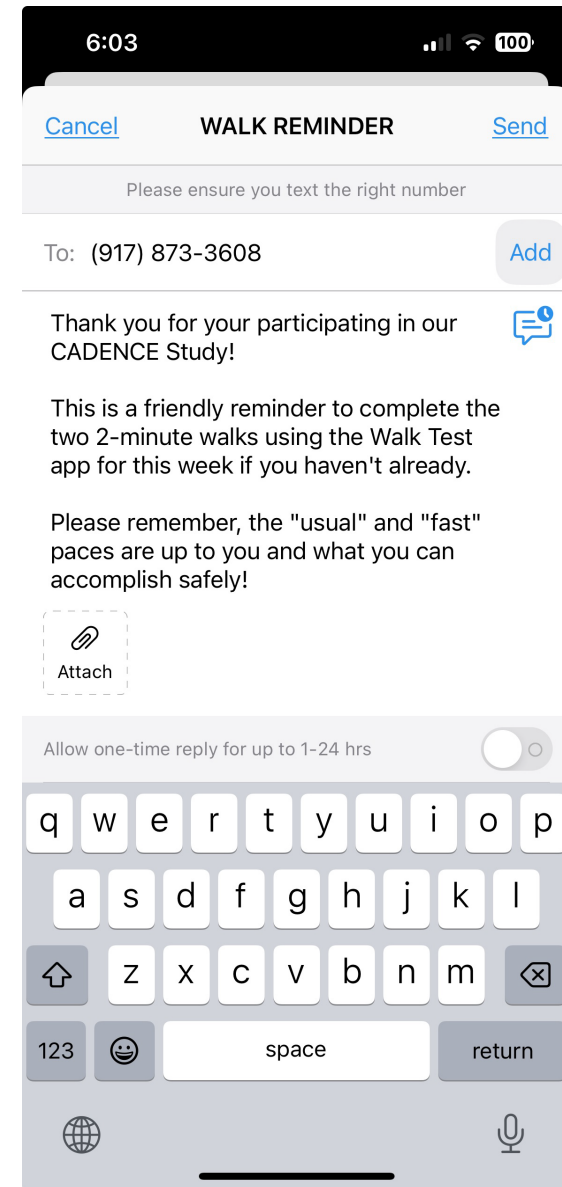
- We recruited from Anesthesia and Perioperative Medicine Clinic
 - Not the only appointment they have that day
 - Surgeon
 - Consultants (i.e., cardiology)
 - Scans and Labs
- They may be exhausted by the time they see you
 - Be efficient with their time
 - Performative assessments took \approx 15 minutes
- Self-report assessments were collected over the phone even before surgery
 - Consistent measurement procedures

We didn't schedule any in-person assessments after surgery



Reminders are critical

- A number of patients thought they were done with the study after surgery...
- Doximity text page reminders (It's free...for doctors)
 - Preset text phrases
 - Can text large groups on the same day
 - Use to schedule phone call follow-ups
- “Bring your accelerometer on the day of surgery”
- “Reminder to do a usual and fast pace walk”



We used the mail to facilitate accelerometer data collection

- ActiGraph accelerometers provide standardized measurements of physical activity
 - Battery life and data storage make it challenging to keep for > 30 days
- Can exchange at follow-up visits
 - If they come to the hospital
- Mailing accelerometers is feasible
 - Send at least 1 week in advance of wear time
 - Provide pre-paid envelope for return shipping
- Zero lost accelerometers through the mail
 - 1 patient lost during 3-month follow-up



To retain patients, get an Emi

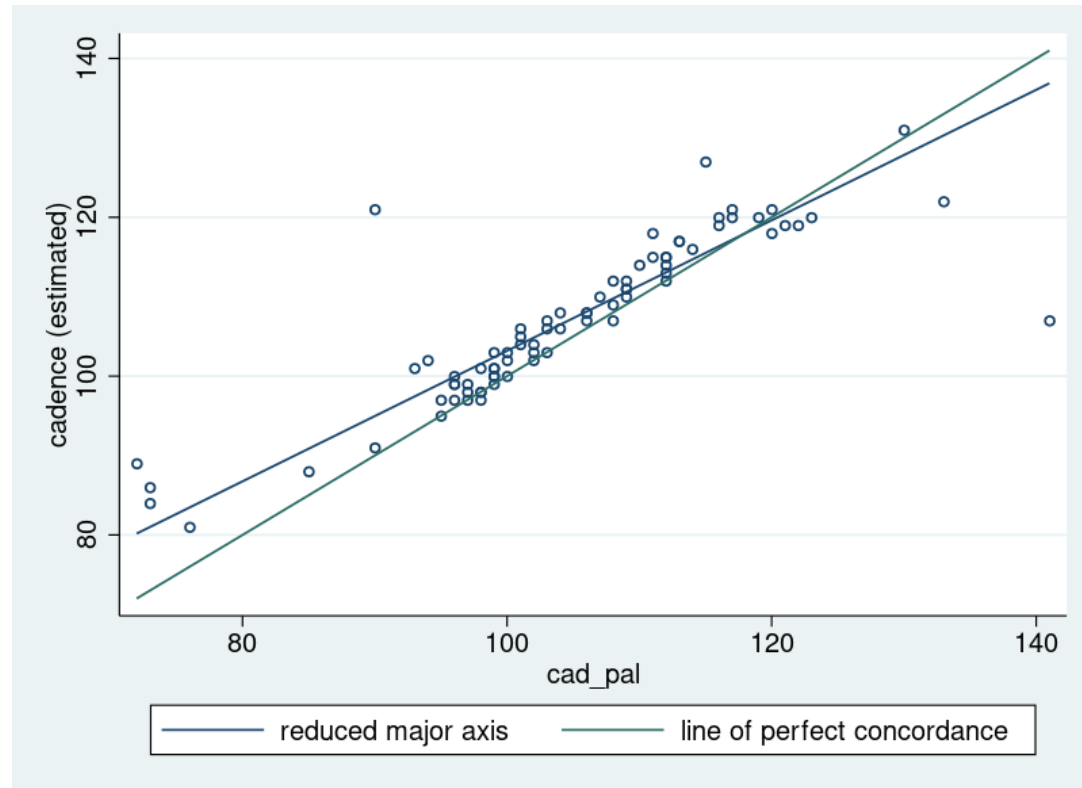
- “Build relationships to retain patients”
 - Zara Cooper referring to SAGES study
- Shout out to my research coordinator
 - Emi Yamamoto
- Retention rate through study 83%
 - 55/66 participants
 - 6=”Too much going on/Overwhelmed”
 - We offered to just do self-report
 - Declined



Patient Relationships Matter

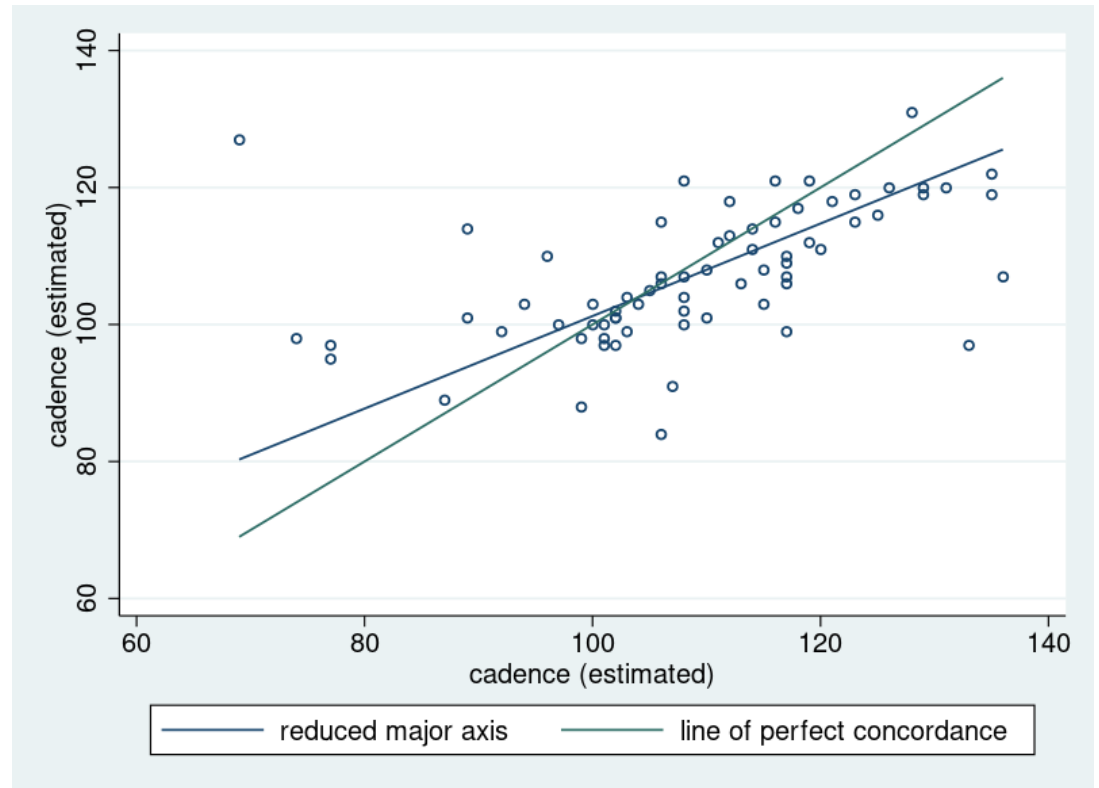
Performance variability at-home decreased accuracy

Walk Test vs. activPAL



Lin's CCC: 0.83 (95% CI: 0.76, 0.89)
Mean difference: 2.4(\pm 6) steps/min
MAPE: 3.8(\pm 6)%

In-Clinic vs. At-home



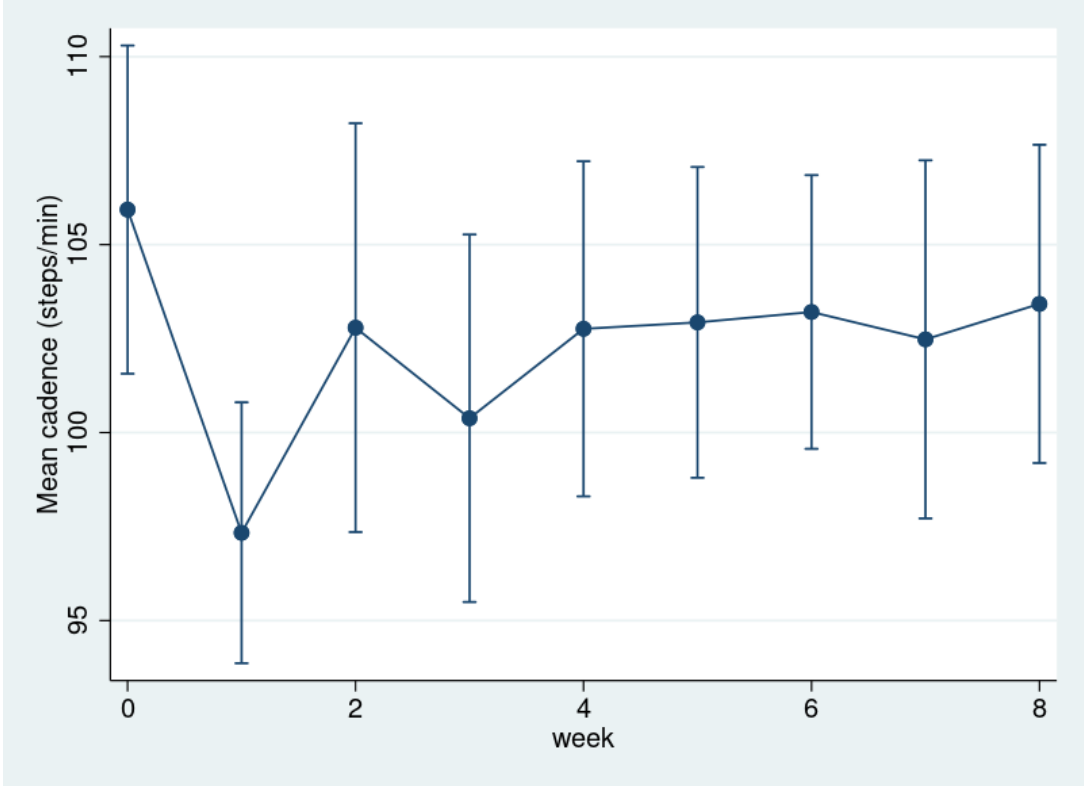
Lin's CCC: 0.46 (95% CI: 0.29, 0.63)
Mean difference: -1.7(\pm 12) steps/min
MAPE: 8.0(\pm 9)%

Lower performance on functional assessments with slower cadence

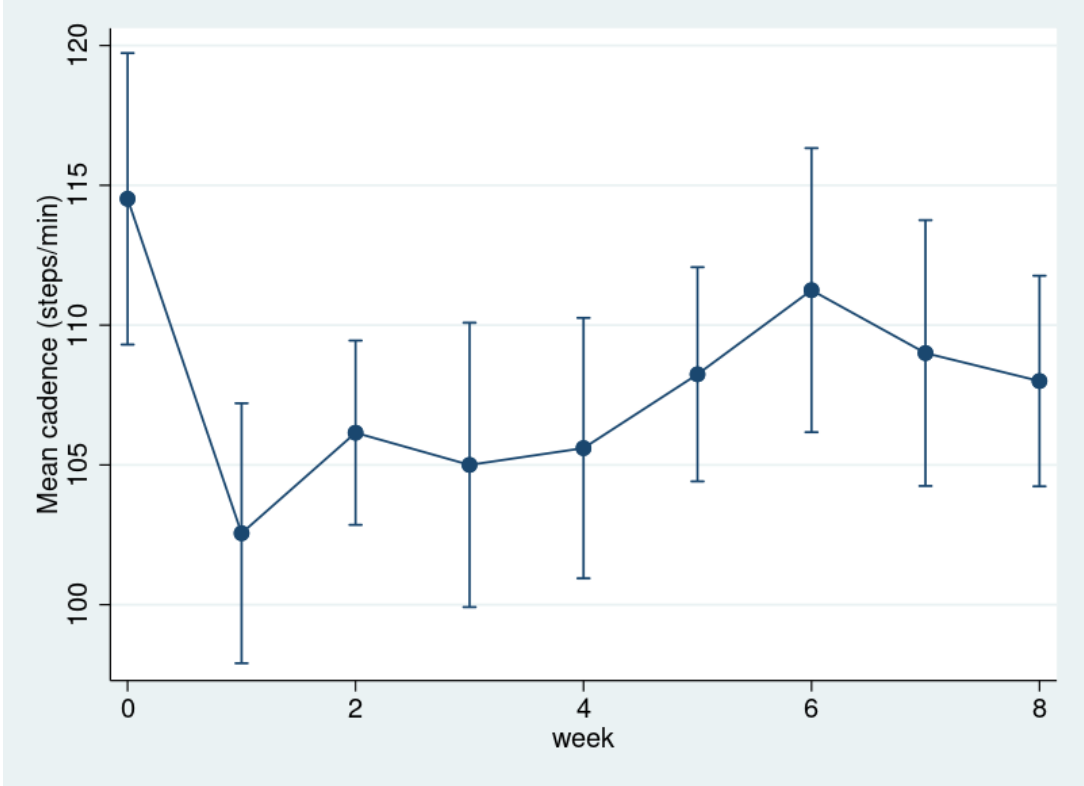
Patient Characteristics	Cadence < 100 steps/min (n=12)	Cadence ≥ 100 steps/min (n=45)	P-value
Age (years)	71 (69 - 74)	69 (68 - 71)	0.283
Gender			0.045
Male	2 (17%)	22 (49%)	
Female	10 (83%)	23 (51%)	
Frailty Score			0.039
Not Frail	4 (33%)	29 (64%)	
Prefrail	5 (42%)	14 (31%)	
Frail	3 (25%)	2 (4%)	
Usual Gait Speed	0.73(0.19)	1.02(0.18)	<0.001
Time to perform 5-sit to stand (seconds)	20 (16 - 24)	12 (12 - 13)	<0.001
Mini-Cognitive Assessment	1 (8%)	3 (7%)	0.841
Duke Activity Status Index	29 (20 - 38)	44 (40 - 49)	0.005
WHO Disability Assessment Schedule 2.0	16 (9 - 24)	7 (4 - 10)	0.005

Fast pace walking capability remains diminished even at week 8

Usual Pace Walks After Surgery



Fast Pace Walks After Surgery



Participants with ≥ 3 weeks of post-operative walks (n=32)



Fearless leader
Gretchen Schwarze M.D.
University of Wisconsin
School of Medicine and
Public Health



Co-Chair
Michael Devinney M.D.
Duke



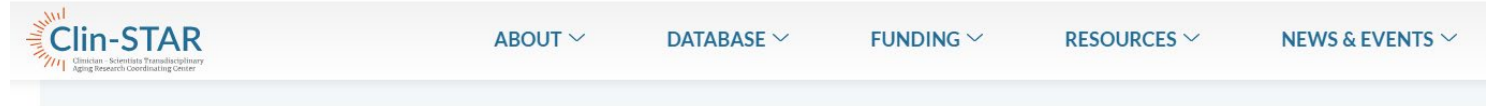
Co-Chair
Lucia Madariaga M.D.
University of Chicago



Co-Chair
Daniel Rubin M.D.
University of Chicago

We have a special interest group!!

If interested in joining this group, please contact: andrea@afar.org



Clin-STAR Aging and Perioperative Research Interest Group

Thursday, May 18, 2023, 4-5 pm ET (intro and planning meeting)

Wednesday, June 28, 4-5 pm ET: Lessons learned about large pragmatic trials designed to improve surgical care for older adults, with Gretchen Schwarze, MD, MPP, FACS and Mark D. Neuman, MD, MSc

Thursday, September 21, 4-5 pm ET: Functional outcomes after surgery: how to study them and build productive collaborations, with Thomas A. Gill, MD and Robert Becher, MD, MS, FACS

Thursday, November 2, 4-5 pm ET: Consultancy session

Thursday, January 11, 2024, 4-5 pm ET: with Thomas Robinson, MD

Thursday, March 7, 4-5 pm ET: with Mark K. Ferguson, MD

Thursday, May 23, 4-5 pm ET: with Zara Cooper, MD, MSc

Thursday, August 8, 4-5 pm ET: Consultancy session

Thursday, September 19, 4-5 pm ET: Emily Finlayson, MD, MS

Thursday, December 12, 4-5 pm ET

Thank you for having me!

Daniel Rubin

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