Physical Activity Intervention to Improve Surgical Spine Outcomes (PASS Trial)

Kristin R. Archer, PhD, DPT
Professor, Orthopaedic Surgery
Professor, Physical Medicine & Rehabilitation
Director, Center for Musculoskeletal Research
Vanderbilt University Medical Center

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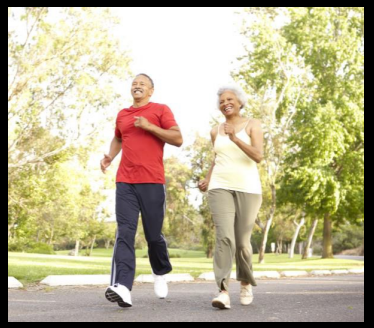
Lumbar Spine Surgery Outcomes

- Wide variation in physical activity (PA) outcomes
  - Up to 80% remain physically inactive after surgery
  - Physical inactivity increases risk of persistent pain/disability



- Patients report needing help with PA due to fear of reinjury and increasing pain
- Wearable technology has improved PA in other orthopaedic populations

Objective

- We aimed to determine the efficacy of a telehealth physical activity intervention in patients following lumbar spine surgery.
  - Wearable technology (Fitbit Inspire HR)
  - Remote physical therapist support
  - Clinicaltrials.gov: NCT04968821

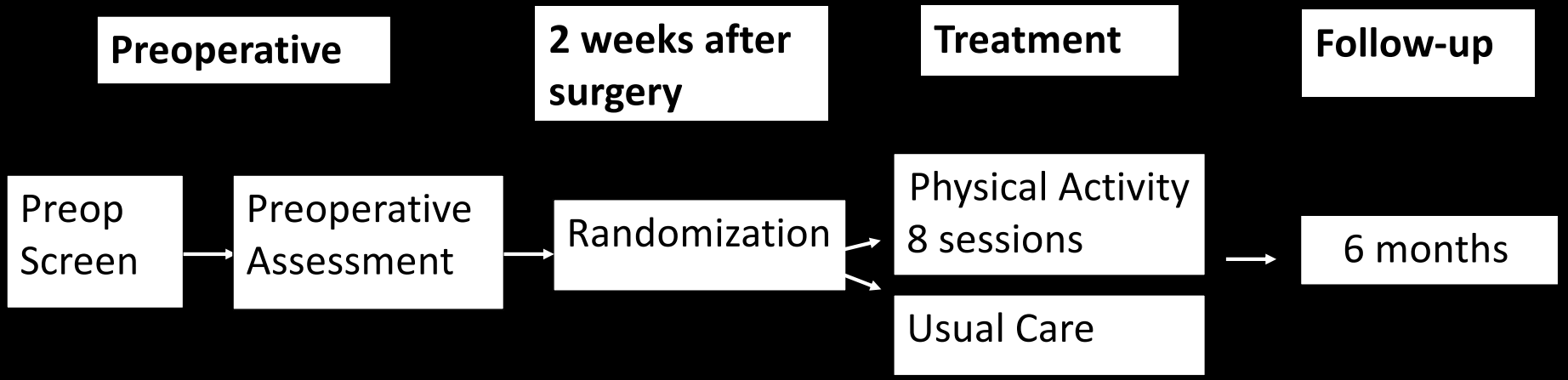
Outcomes at 6 Months

- Primary Physical Activity Outcome (accelerometer):
  - Activity counts per day
- Secondary Physical Activity Outcome (accelerometer):
  - Time spent in moderate-to-vigorous physical activity (MVPA)
- Secondary PROs
  - Physical Function (PROMIS PF)
  - Disability (ODI)
  - Back Pain (NRS)
  - Leg Pain (NRS)
  - Return to Physical Activity

Study Participants

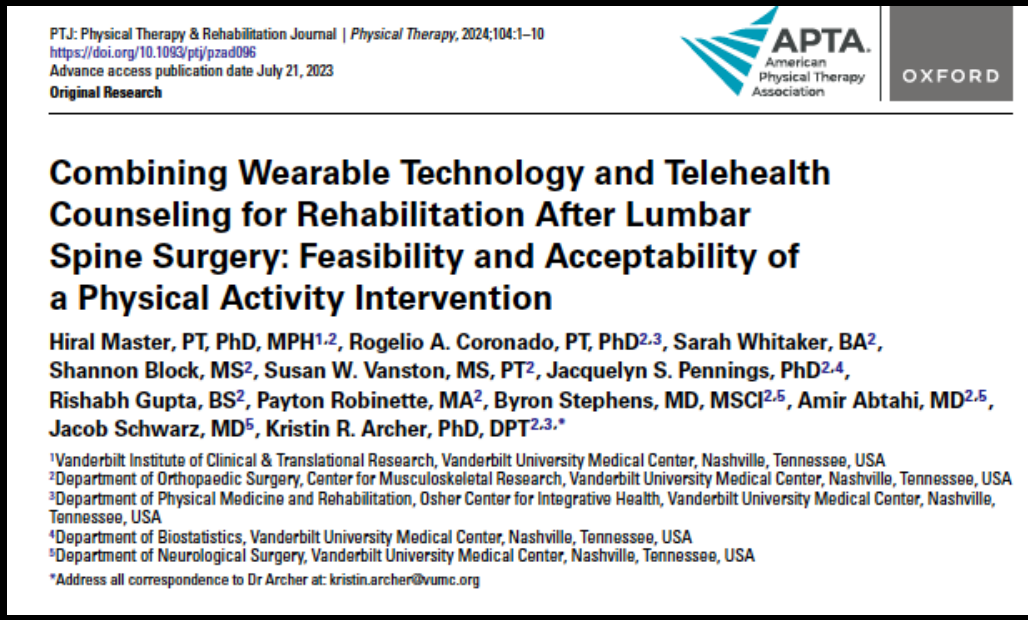
- Inclusion Criteria (adults)
  - Lumbar degenerative condition
    - spinal stenosis, spondylosis with or without myelopathy, degenerative spondylolisthesis
  - Surgical treatment
    - laminectomy with or without arthrodesis
  - Exclusions: revision surgery, microsurgical techniques, spinal deformity, trauma, tumor, infection

Randomized Controlled Trial Design



Physical Activity Treatment Protocol

- Remotely delivered (ZOOM)
- 8 sessions weekly
- Wearable device (Fitbit)
- PT Counseling
  - Motivational interviewing
  - Goal Setting
    - Fitabase review
    - Weekly walking goals
    - Goal tracking sheet



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Original Research

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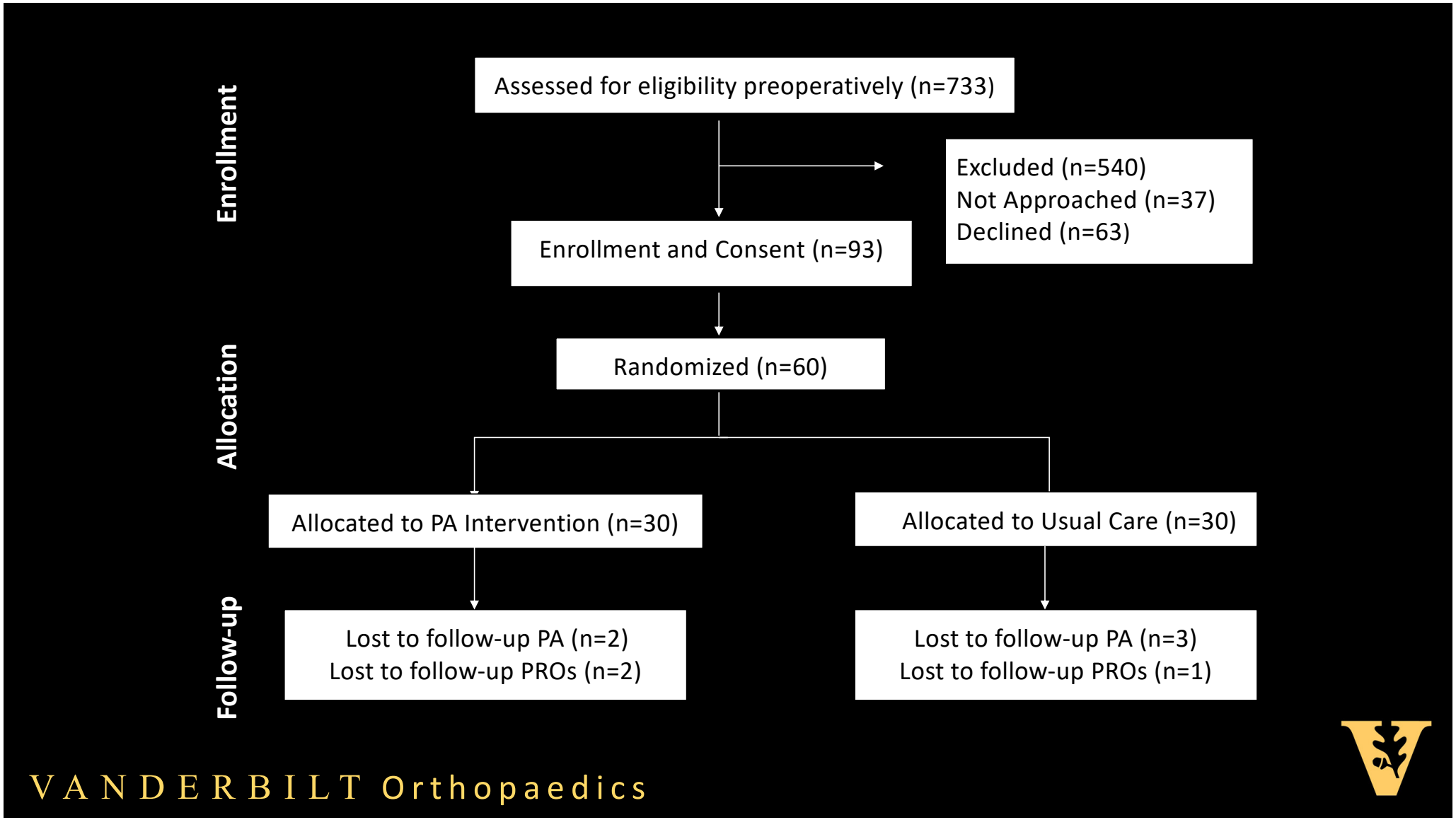
Combining Wearable Technology and Telehealth Counseling for Rehabilitation After Lumbar Spine Surgery: Feasibility and Acceptability of a Physical Activity Intervention

Hiral Master, PT, PhD, MPH[1,2], Rogelio A. Coronado, PT, PhD[2,3], Sarah Whitaker, BA[2], Shannon Block, MS[2], Susan W. Vanston, MS, PT[2], Jacquelyn S. Pennings, PhD[2,4], Rishabh Gupta, BS[2], Payton Robinette, MA[2], Byron Stephens, MD, MSCI[2,5], Amir Abtahi, MD[2,5], Jacob Schwarz, MD[5], Kristin R. Archer, PhD, DPT[2,3,*]

[1]Vanderbilt Institute of Clinical & Translational Research, Vanderbilt University Medical Center, Nashville, Tennessee, USA
[2]Department of Orthopaedic Surgery, Center for Musculoskeletal Research, Vanderbilt University Medical Center, Nashville, Tennessee, USA
[3]Department of Physical Medicine and Rehabilitation, Osher Center for Integrative Health, Vanderbilt University Medical Center, Nashville, Tennessee, USA
[4]Department of Biostatistics, Vanderbilt University Medical Center, Nashville, Tennessee, USA
[5]Department of Neurological Surgery, Vanderbilt University Medical Center, Nashville, Tennessee, USA
*Address all correspondence to Dr Archer at: kristin.archer@vumc.org


Enrollment
Assessed for eligibility preoperatively (n=733)
Excluded (n=540)
Not Approached (n=37)
Declined (n=63)
Enrollment and Consent (n=93)
Allocation
Randomized (n=60)
Allocated to PA Intervention (n=30)
Allocated to Usual Care (n=30)
Follow-up
Lost to follow-up PA (n=2)
Lost to follow-up PROs (n=2)
Lost to follow-up PA (n=3)
Lost to follow-up PROs (n=1)
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Description of the Sample

Variable	PA Intervention (n=30)	Usual Care (n=30)	Total sample
Age (yrs)	59.7 (13.2)	62 (10.8)	60.9 (12.0)
Education, (%) Greater than HS	 76.7	 63.3	 70
Male, (%)	53.3	26.7	40
Married, (%)	80	63.3	71.7
White, (%)	83.3	90	86.7
Employed, (%) Retired Not Working Working	 33.3 13.4 53.3	 40 3.3 56.7	 36.7 8.3 55
Fusion, (%)	63.3	63.3	63.3
Spinal Stenosis, (%)	56.7	66.7	61.7

Proportional Odds Regression Results

Odds ratio for Intervention

Primary Outcome	Odds Ratio*	95% CI	P-value	R^2
Activity Counts per day	2.9	1.06 to 8.2	**.039**	0.58

* Model controlled for outcome preoperatively and sex

Proportional Odds Regression Results

Odds ratio for Intervention

Primary Outcome	Odds Ratio*	95% CI	P-value	R^2
Activity Counts per day	2.9	1.06 to 8.2	**.039**	0.58
Secondary Outcome				
Time spent in MVPA	4.2	1.5 to 11.9	**.007**	0.41

* Models controlled for outcome preoperatively and sex

Linear Regression Results

Beta coefficient for Intervention

Secondary Outcomes	β*	95% CI	P-value	R^2
PROMIS PF	3.9	0.32 to 7.4	**.03**	0.39
ODI	-4.2	-10.9 to 2.6	.21	0.48
Back Pain	-1.3	-2.4 to -0.13	**.03**	0.25
Leg Pain	-1.2	-2.4 to 1.2	.06	0.14

* Models controlled for outcome preoperatively and sex

Logistic Regression Results

Odds Ratio for Intervention

Outcome	Odds Ratio*	**95% CI**	**P-value**	**R^2**
Return to Physical Activity	6.0	1.9 to 21.7	**.004**	0.17

* Model controlled for sex

Intervention Assessment (N=27)

	Mean (SD)
Helpful to recovery (0-10), mean (SD)	9.0 (1.3)
Likely to recommend (0-10), mean (SD)	9.3 (1.1)
Activity increased a meaningful amount, N (%)	23 (85%)
Intervention more important than other services, N (%)	19 (70%)
Benefits outweighed the effort, N (%)	17 (63%)

Discussion

- Statistically significant differences across groups at 6 months
  - Physical activity, physical function, back pain

- High adherence and satisfaction with intervention
  - 77% completed all 8 sessions
  - 85% extremely likely to recommend/activity increased meaningful amount
  - 70% extremely helpful to overall recovery/more important than other services

Clinical Implications

- Wearable technology and physical therapist counseling has potential to improve physical activity/exercise adherence
- Physical activity screening may be beneficial for a targeted rehabilitation approach
- Walking programs alone or in combination with traditional rehabilitation may be an effective way to improve outcomes

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Thank You

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Vanderbilt Center for Musculoskeletal Research
https://www.vumc.org/musculoskeletal-research
Kristin.archer@vumc.org
@VUMC_MSK

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