



# IMPLEMENTING ENERGY CONSERVATION STRATEGIES AFTER HOSPITAL DISCHARGE AND BEYOND

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# AGENDA



Introductions



Returning Home from the Hospital



Benefits of Exercise and Attending Pulmonary Rehab



Energy Conservation



Take Aways

# KAYLA MAHONEY, MS, CCRP, CSCS



- Lead Care Specialist & Exercise Physiologist
- 8 years at TMH
- AACVPR Certified Cardiac Rehab Professional & PR Certificate
- Certified Strength and Conditioning Professional
- University of Rhode Island: Kinesiology, MS
- University of Vermont: Exercise and Movement Science, BS

# JACKIE PIERCE, PT,CCS,CCRP, FAACVPR



- APTA Certified Cardiopulmonary Specialist
- Physical Therapist for 37 years!
- Pulmonary Rehab Clinician for 25 years
- AACVPR Certified Cardiac Rehab Professional & PR Certificate
- Adjunct Faculty at University of Rhode Island
- Graduate of University of New England



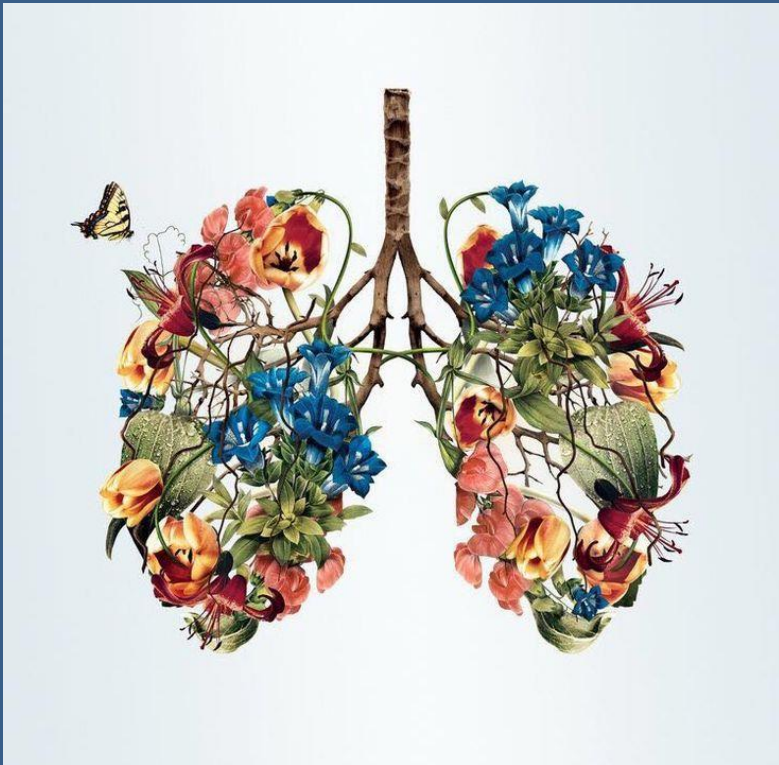
# BEFORE YOU LEAVE THE HOSPITAL:

Make sure that you ask all your questions!

- If you are a smoker-ask for resources to help quit
- Ask about home services: nursing, home health aide, physical and occupational therapy
- What signs should I watch out for so that I don't get sick again?
- Ask about medications and O2 use
- Ask about pulmonary rehab

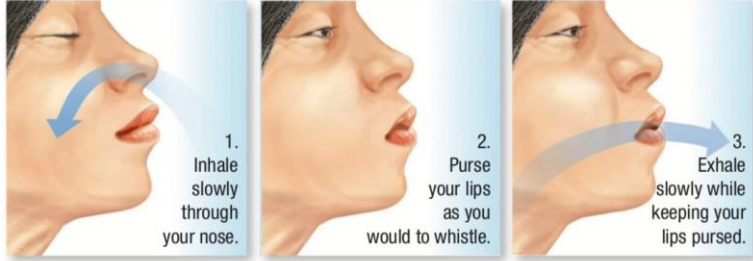


# GETTING BACK TO YOUR LIFE



- 1. Give yourself time to return to your regular activities !!**
2. Use your oxygen if it has been prescribed for you
3. Consider devices that can help you while you heal:
  - a. Walkers
  - b. Reachers
  - c. Bathroom equipment
4. Breathing techniques

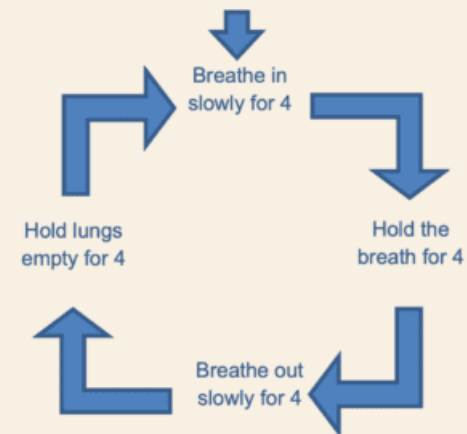
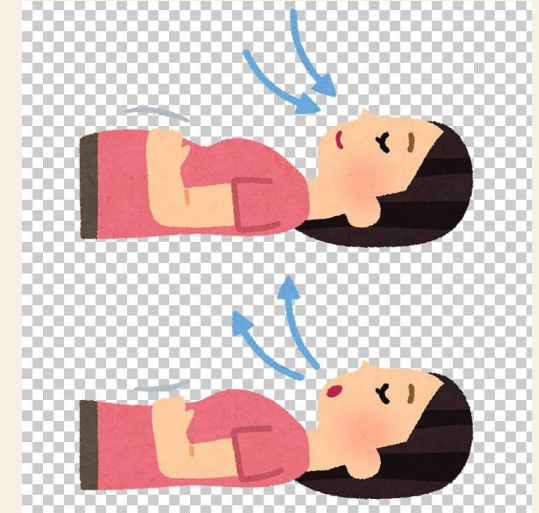
### Pursed-lip breathing technique



**Note:** Do not force your lungs to empty completely.

# BREATHING EXERCISES TO TRY:

- Pursed Lips Breathing
- Breathing Control
- Diaphragmatic Breathing
- Box Breathing
- Stacking



# GRADUALLY RESUME YOUR ACTIVITIES

1. Start with some light exercise:

- Biceps curls
- Arm raises
- Sit to stand from chair
- Knee extension
- Ankle pumps
- Get up and walk

**2. It's OK to take a break when you need it**

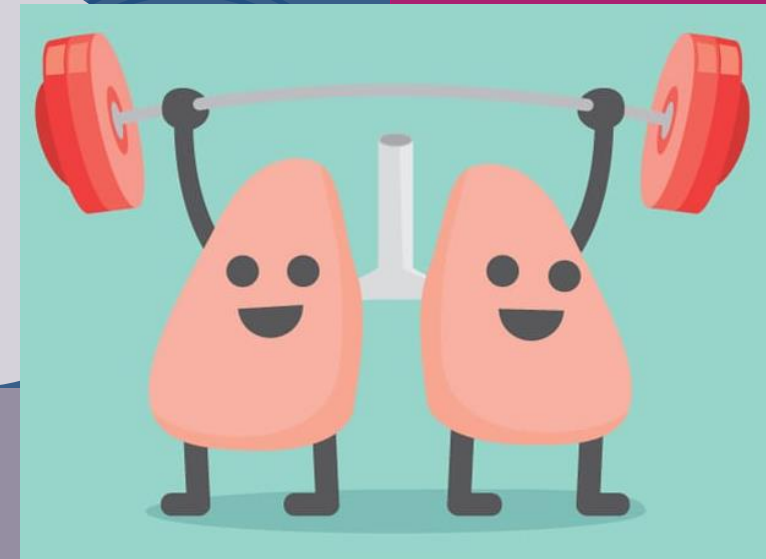
3. Talk to your doctor about Pulmonary Rehab



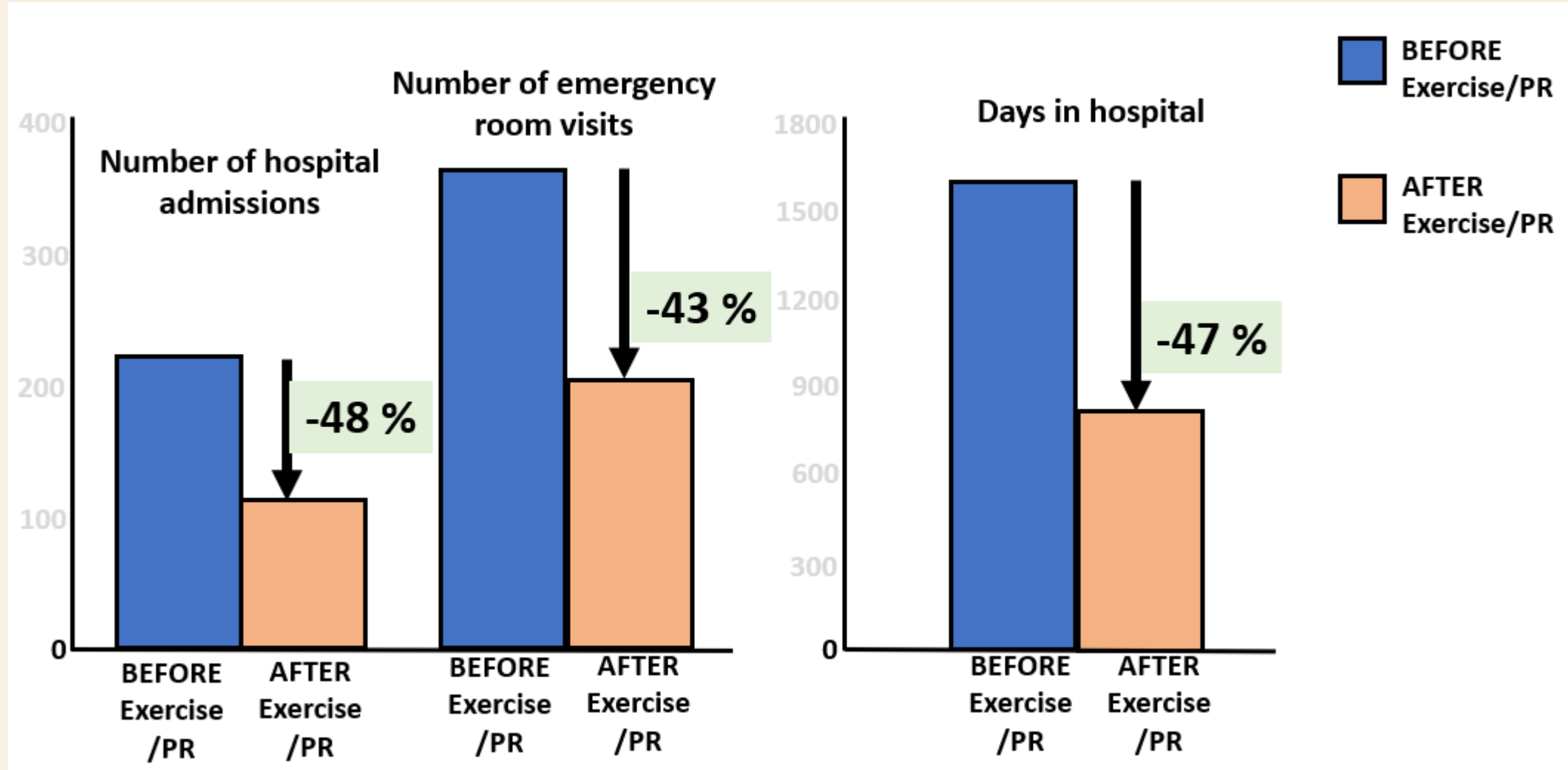


# PULMONARY REHAB OBJECTIVES

Improve	Improve strength and stamina.
Educate	Educate the participant and their family about pulmonary disease
Aid in	Aid in risk factor modification & reduce exacerbation/re-hospitalization
Assist	Assist the patient in return to work or activities of daily living
Promote	Promote psychological adjustment to chronic illness
Improve	Improve quality of life.



# BENEFITS OF ATTENDING PR



# LUNG DISEASE AND PHYSICAL ACTIVITY

Greater functional impairment, disability, and dependence on others



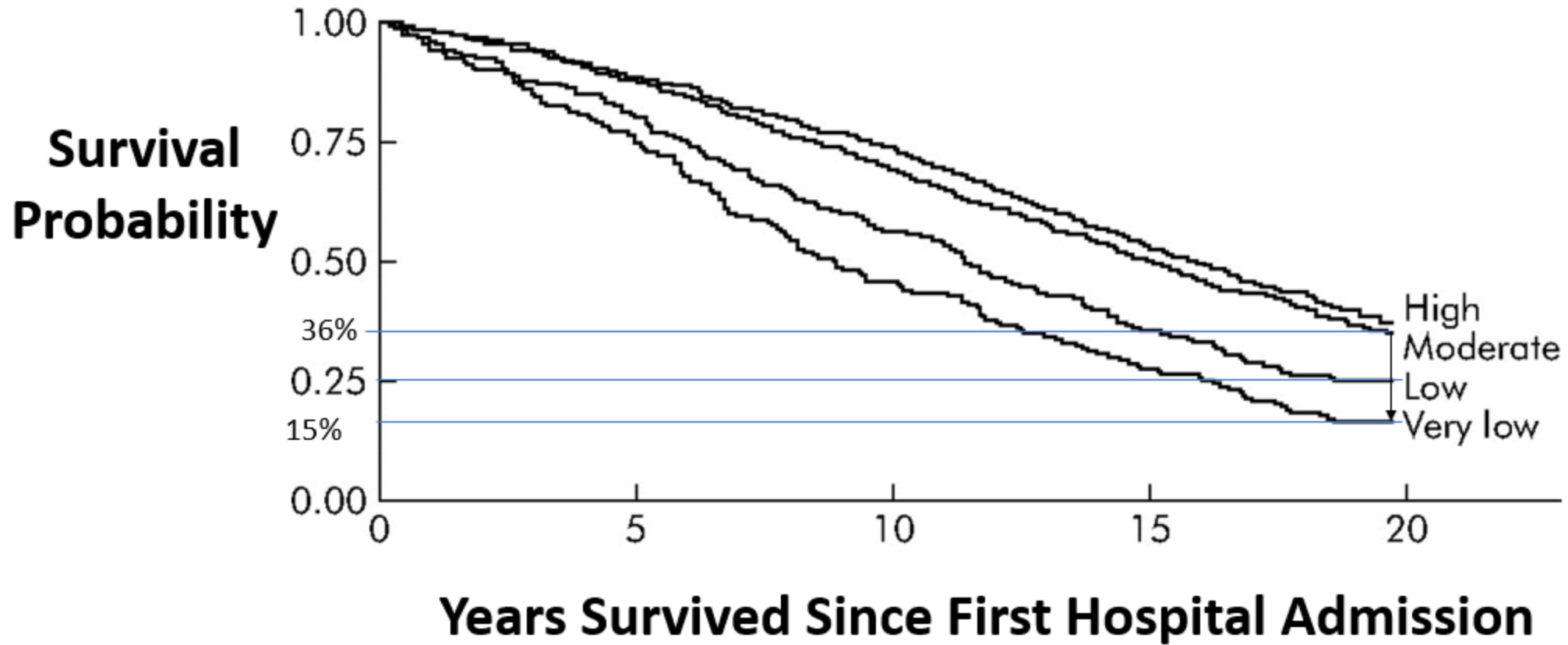
# THE BENEFITS OF EXERCISE

- Brain and Mental Health
- Heart Health
  - lower BP, improved blood flow
- Lung Health
  - strengthens breathing muscles in chest
  - Helps reduce dyspnea
- Muscle Health
  - increases strength, endurance, decreases fatigue
  - Improves balance and lowers risk of falls
- Bone Health
  - Improves bone strength, lowers risk of osteoporosis



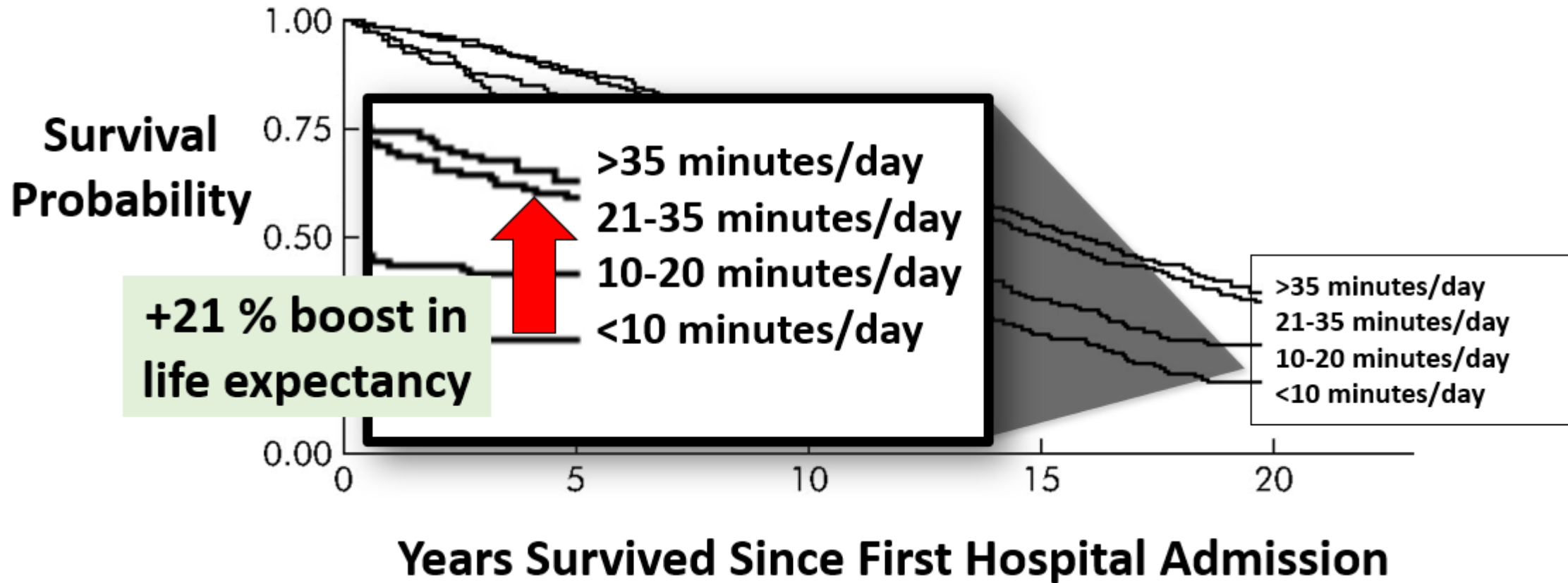


## Physical Activity Extends Your Life



- ZuWallack, R, Chest 2016 adapted from Garcia-Aymerich et al., Thorax 2006 61 772-778,

# Physical Activity (any movement) Extends Your Life



**Objective:** To summarize evidence on the association of PA and exercise capacity and mortality risk in people with ILD, and to quantify its magnitude by conducting a meta-analysis.

## METHODS

### Data Sources:



Up to September 2021

**Data Extraction:** authors independently screened studies, extracted data and assessed risk of bias with the **Newcastle–Ottawa Scale**.

### Data analysis:

Primary outcome >> **overall mortality.**

**Random-effects meta-analysis** of logarithmic **hazard ratios.**

Heterogeneity was quantified using **I-squared statistic.**

Publication bias >> visual inspection of **funnel plots.**

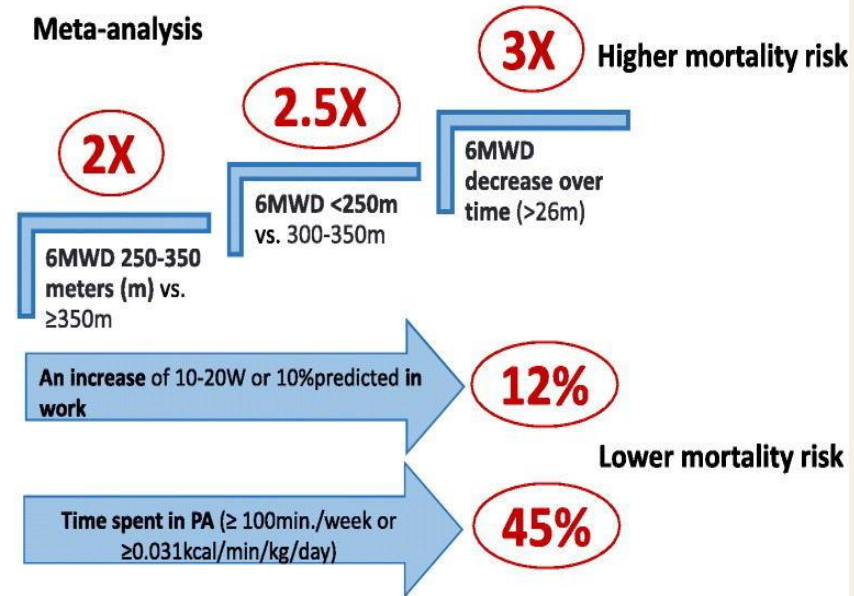
## RESULTS

**52** studies were included with **10 349** people with ILD.  
 AGE:  $64 \pm 9$  years    67% ♂    78% idiopathic pulmonary fibrosis  
 Mean DLCO:  $48.2 \pm 15.5\%$  predicted

### Most reported measures:



### Meta-analysis



**Physical activity and exercise capacity measures were associated with mortality risk in people with ILD. Personalised interventions to improve PA should be considered to delay premature mortality in people with ILD.**



# Momentum!



You do more activity to help your breathlessness

You're motivated to continue being active



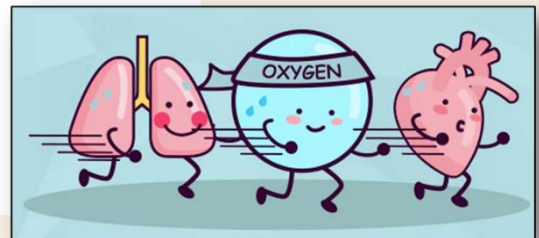
Your muscles become stronger



Your muscles use oxygen more efficiently

You're less breathless and tasks become easier

You feel better



• Mark Hartman, PhD





**WHAT ACTIVITIES  
MAKE YOU MOST  
SHORT OF BREATH?**

# ENERGY CONSERVATION

- Modify and simplify tasks so that you have more energy for the activities that are the most meaningful in your life
- Pacing and pursed lip breathing techniques will allow you to conserve energy and reduce shortness of breath
- Balance work and rest
- Specificity of training for problematic tasks



Slow and Steady Wins the Race





# OUR RESEARCH PROJECT ON EC

Tasks: Stairclimbing, Reaching, Bending, Vacuuming, and Making the Bed



# RESULTS OF OUR STUDY

Comparison between Pulmonary Rehab and Energy Conservation Patient Outcomes

	<b>Pre EC</b> N = 85	<b>Post EC</b>	<b>p-value</b>	<b>Pre TPR</b> N = 91	<b>Post TPR</b>	<b>p-value</b>	<b>Change Between Groups</b>
<b>MMRC</b>	1.93 ± 0.99	1.32 ± 0.88	0.01	1.81 ± 0.09	1.49 ± 0.99	0.01	0.07
<b>CAT</b>	18.49 ± 7.17	14.75 ± 7.19	0.01	17.40 ± 6.76	16.73 ± 7.46	0.39	0.01
<b>CRQD</b>	15.93 ± 4.77	20.67 ± 6.06	0.01	14.82 ± 5.35	17.98 ± 6.51	0.01	0.05
<b>CRQF</b>	1.93 ± 0.99	1.32 ± 0.88	0.01	14.71 ± 4.09	17.03 ± 4.08	0.01	0.20
<b>6MWT</b>	1035.71 ± 376.43	1192.98 ± 389.58	0.01	1138.35 ± 362.27	1328.21 ± 386.87	0.01	0.96

\*Vales given as mean ± SD unless otherwise indicated

\* p ≤ 0.05

What do you know, it worked!

- EC training and resistance training specific to activities of daily living (ADLs) improved health related quality of life



[Efficacy of adding activity of daily living simulation training to traditional pulmonary rehabilitation on dyspnea and health-related quality-of-life \(plos.org\)](https://doi.org/10.1371/journal.plosone.0242801)

**PLOS ONE**

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RESEARCH ARTICLE

# Efficacy of adding activity of daily living simulation training to traditional pulmonary rehabilitation on dyspnea and health-related quality-of-life

Kayla Mahoney<sup>1</sup>, Jacqueline Pierce<sup>1</sup>, Stacey Papo<sup>2</sup>, Hafiz Imran<sup>1,3</sup>, Samuel Evans<sup>2</sup>, Wen-Chih Wu<sup>1,3\*</sup> 

# THREE "PS" OF EC

1. Pacing (Slow down)

2. Planning

Prioritize most important first

Spread out heavy tasks across the week, not on the same day

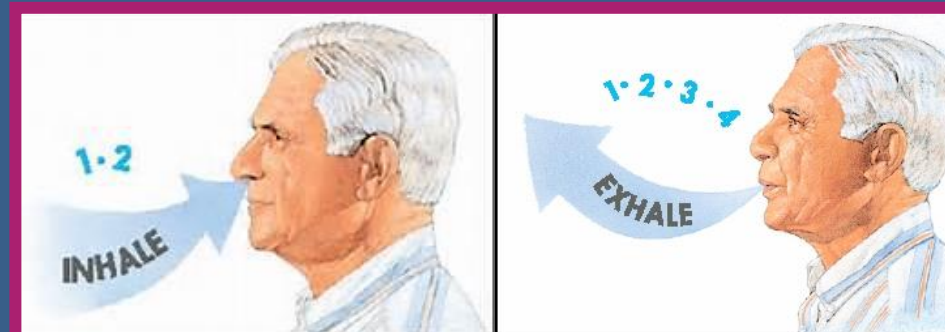
Complete most difficult tasks at your best time of day

Rest before you feel overtired

Delegate (family members, hired help, etc.)

Be aware of your own activity tolerance

3. Pursed Lip Breathing



# BENDING

- Demands: active flexibility of the hips, hamstrings, and low back
- Diaphragm gets compressed
  - Keep your back straight
  - Blow out while you bend, do not hold your breath
- Using correct body mechanics and posture will place less stress on your muscles and joints and reduce fatigue
  - Keep the item close to you, bend at the knees, and lift with your legs



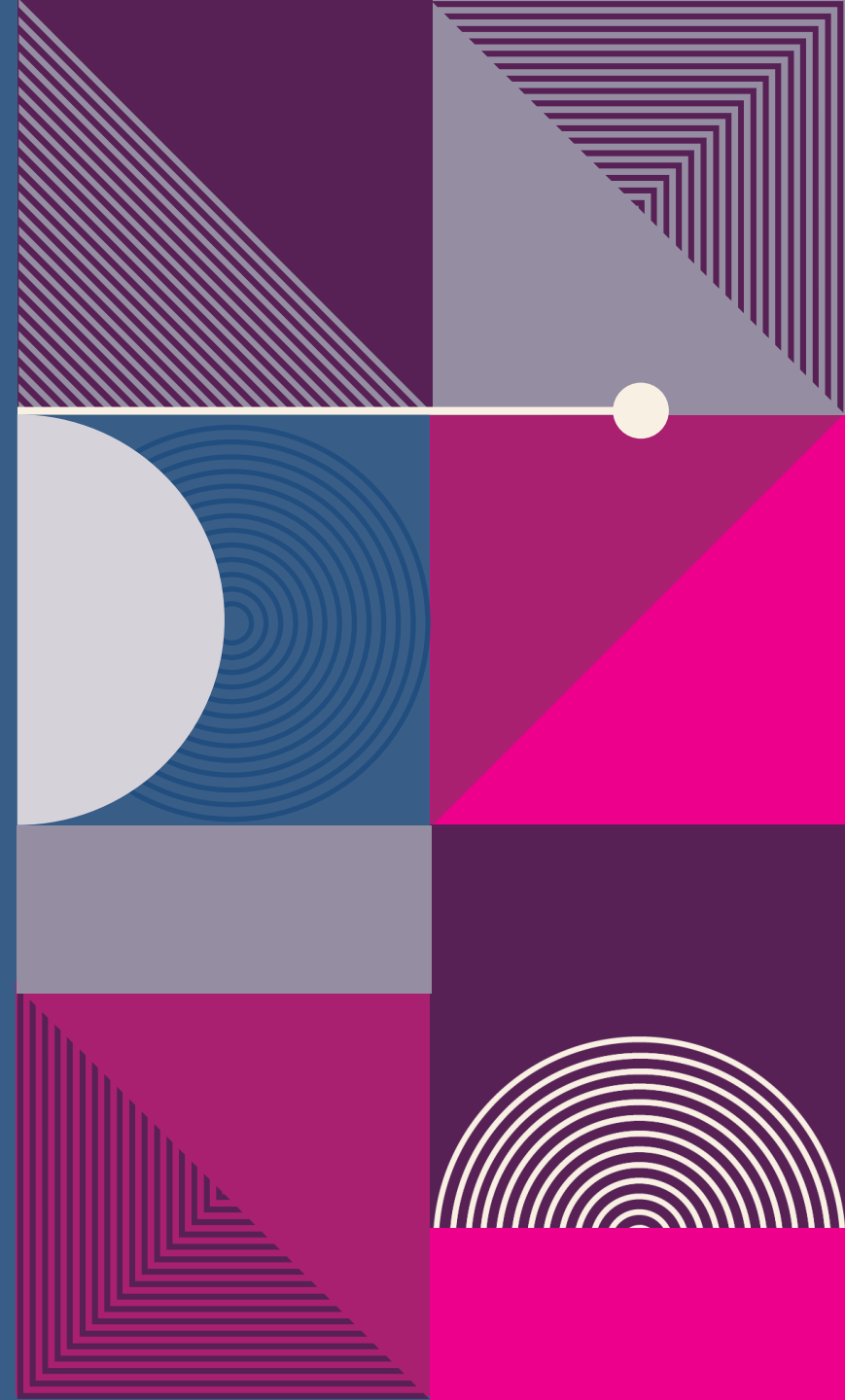
# EC STRATEGIES





# REACHING AND CARRYING

- Demands: core strength and shoulder flexibility
- Reaching is performed in multiple directions
- Often reaching is followed by lifting or carrying an external load
- Avoid holding your breath when you lift objects overhead

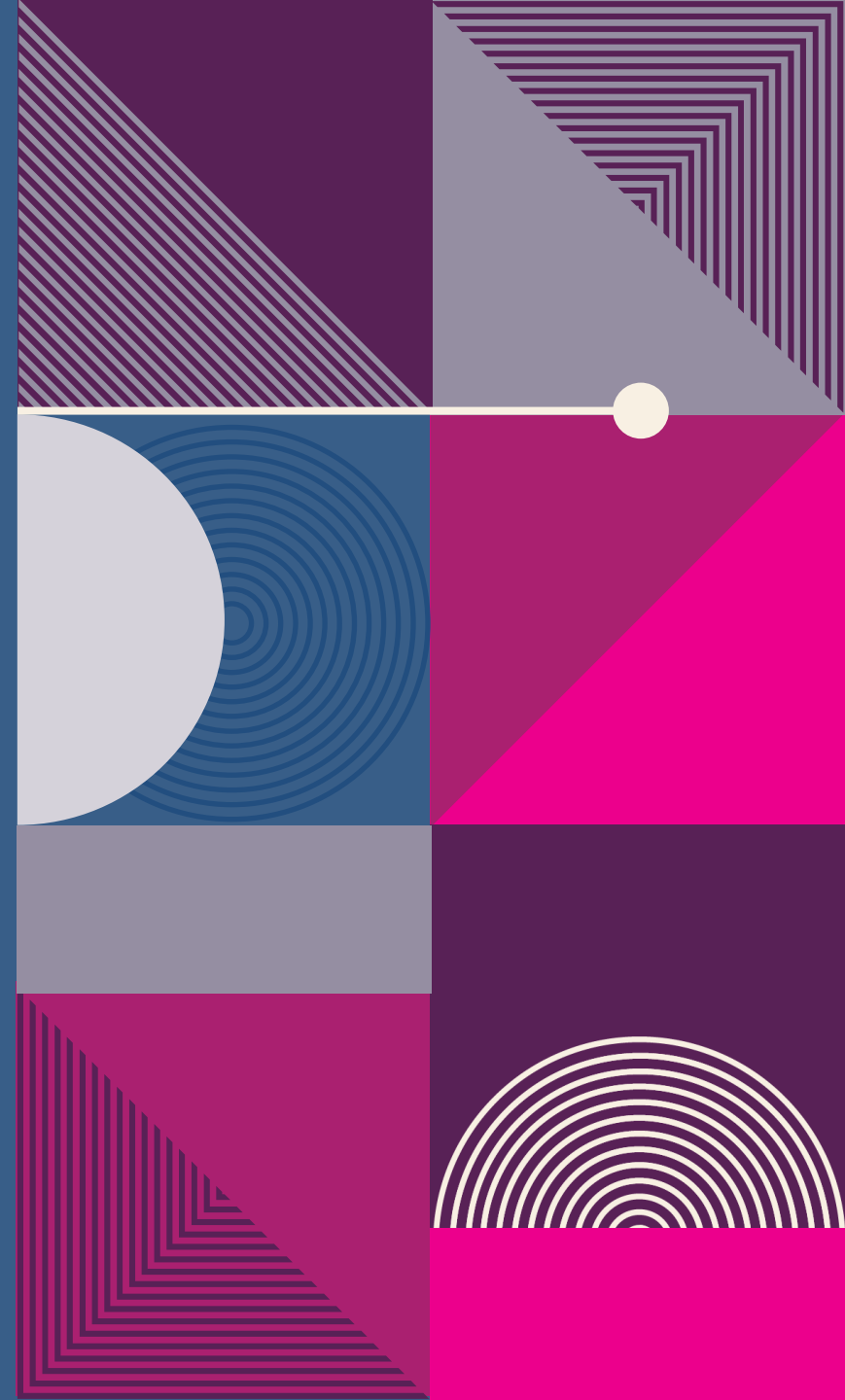


# TIPS FOR SUCCESS

- Store the items you use the most at waist level
- Avoid carrying things next to your chest
- Carry grocery bags over your shoulders
  - Multiple trips (refrigerated items first)
- Consider using a cart or backpack



# EC STRATEGIES





# STAIR CLIMBING

- Demands: leg strength, balance, and muscular endurance
- Don't rush up the stairs
- Consider placing a chair at the top for rest when appropriate
- Pace your steps with PLB
- Recruit help to carry items up and down





# VACUUMING

- Demands: coordination of upper and lower body, weight shifting/balance, upper body and core strength
- May trigger allergy symptoms as dust and dander circulate the room that you are cleaning
- Recall the 3 P's (Pacing, Planning, PLB)
  - Spread out bouts across the day or week
  - Take it one room at a time
  - Consider your best time of day
  - Take rests when you need them



# EC STRATEGIES

- Consider sitting for small areas
- Consider the weight and size
- Recruit help from family
- Consider hiring someone to clean your home



# MAKING THE BED



- Demands: requires that you reach, bend, rotate, walk laterally, and lift an external load
- Consider performing tasks individually with rest in between tasks
  - Sit to dress pillows
  - Stretch a fitted sheet over the mattress
  - Shake and stretch the top sheet, blankets, and comforter
- Recruit a partner

# OTHER STRATEGIES TO CONSIDER





# TAKE AWAYS

- Resume prior activities slowly when returning home from the hospital
- Consider enrolling in Pulmonary Rehab
- Implement the 3P's of Energy Conservation and consider using strategies to modify home ADLs
- Sit less and move more, but take rests as needed

# PRACTICE AT HOME

## Activities of Daily Living - YouTube

**Activities of Daily Living**  
Miriam Hospital - Center for Cardiac Fitness  
5 videos 59 views Last updated on May 6, 2021

Play all Shuffle

- 1** **Activities of Daily Living - Vacuum**  
Miriam Hospital - Center for Cardiac Fitness • 42 views • 3 years ago  
7:22
- 2** **Activities of Daily Living - Reaching**  
Miriam Hospital - Center for Cardiac Fitness • 60 views • 3 years ago  
10:23
- 3** **Functional and Core Training**  
Miriam Hospital - Center for Cardiac Fitness • 40 views • 3 years ago  
18:02
- 4** **Activities of Daily Living - Bending**  
Miriam Hospital - Center for Cardiac Fitness • 43 views • 3 years ago  
11:53
- 5** **Activities of Daily Living - Stairs**  
Miriam Hospital - Center for Cardiac Fitness • 28 views • 3 years ago  
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# THANK YOU

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