



# TSANZSRS Conference 2024

## Gold Coast

### Pulmonary Rehabilitation Updates

<https://tcc.eventsair.com/QuickEventWebsitePortal/tsanzsrs24/program/Agenda>



# TSANZ Symposium: Using innovative exercise prescription to improve exercise capacity in chronic lung disease



**Dr Collette Menadue**  
Senior Physiotherapist,  
Respiratory Support Service  
Royal Prince Alfred Hospital

## Using non-invasive ventilation in the rehabilitation setting in chronic lung disease

🕒 8:30 AM - 8:50 AM

### Biography

Dr Collette Menadue is a senior physiotherapist within the Respiratory Support Service at Royal Prince Alfred Hospital in Sydney. She has worked in the area of sleep, respiratory failure and non-invasive ventilation (NIV) for over 20 years and completed her PhD in the area of NIV during exercise in 2010. Collette supervises PhD and honours research students and current research interests include NIV during exercise in people with chronic obstructive pulmonary disease, respiratory assessment and management of people with motor neurone disease, the effects of positive airway pressure therapy in people with overlap syndrome and infection control and NIV.



**Dr Leona Dowman**  
Research Fellow  
Monash University

## High intensity interval training in chronic lung disease: Benefits and challenges

🕒 8:50 AM - 9:10 AM

### Biography

Leona is a senior exercise physiologist in the pulmonary rehabilitation program at Austin Health in Melbourne. She completed her PhD in 'Therapeutic interventions in interstitial lung disease. Exercise training and supplemental oxygen' through the La Trobe University, Melbourne. For her PhD she led a multi-site randomised controlled trial which defined the benefits of pulmonary rehabilitation for ILD across disease subgroups, published in 2017 in Thorax. Leona currently holds a postdoctoral position Monash University, under Prof Anne Holland.



**Dr Eliso Alves Pereira Neto**  
Lecturer In Physiotherapy  
(Acute Care)  
University of South Australia

## Using blood flow restriction training in clinical populations: What are the risks and possible benefits?

🕒 9:10 AM - 9:30 AM

### Biography

Elisio is a physiotherapist and lecturer in physiotherapy at University of South Australia. Dr Elisio is an early career researcher with experience in blood restricted exercise training for people living with Chronic Obstructive Pulmonary Disease.



**Prof Norman Morris**  
Professor of Physiotherapy  
Griffith University / The Prince  
Charles Hospital

## Can we use heating to improve exercise capacity in chronic lung disease?

🕒 9:30 AM - 9:50 AM

### Biography

Professor Norman Morris holds a joint research position as The Prince Charles Hospital, Brisbane and Griffith University on the Gold Coast. His program of research examines the factors that limit, and interventions that improve, exercise tolerance in individuals with chronic heart and lung disease and is undertaken in both clinical and laboratory-based settings.

# TSANZ Symposium: Apps, wearables and virtual wards: Digital solutions to socio-economic and health equity challenges

## Advances in monitoring and delivery of pulmonary rehabilitation using mobile health (mHealth) platforms in chronic lung disease



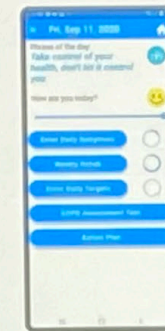
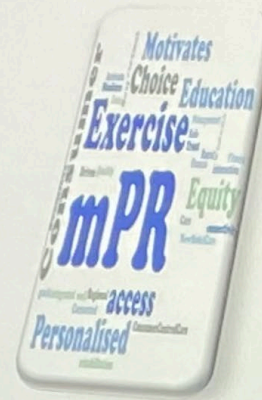
**Assoc Prof Zoe McKeough**  
Associate Professor  
University of Sydney

### Advances in monitoring and delivery of pulmonary rehabilitation using mobile health (mHealth) platforms in chronic lung disease

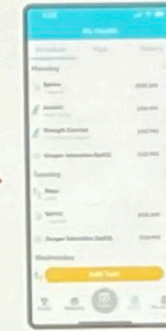
Presented by:  
A/Prof Zoe McKeough

Discipline of Physiotherapy,  
Faculty of Medicine and Health, USYD  
[zoe.mckeough@sydney.edu.au](mailto:zoe.mckeough@sydney.edu.au)

Perx Advisor, Perx Health



m-PR



Perx-R





# TSANZ SIG Orals: Physiotherapy


<https://tcc.eventsair.com/QuickEventWebsitePortal/tsanzsrs24/program/Agenda/AgendaItemDetail?id=26e28846-b333-4942-b373-02f588f896ab>

Compared to Masimo (Gold standard)  
Heartsure, then NoninWristO<sub>2</sub>  
Biobeat Wristwatch – overestimated SpO<sub>2</sub>

**Dr Leona Dowman**  
Research Fellow  
Monash University

## Survival benefit of pulmonary rehabilitation in interstitial lung disease

8:30 AM - 8:45 AM


Abstract 

### Biography

Dr Leona Dowman is a senior exercise physiologist in the pulmonary rehabilitation program at Austin Health in Melbourne. She has extensive experience in both research and clinical care for people with interstitial lung disease (ILD), specifically in pulmonary rehabilitation (PR) and the management of oxygen requirements during exercise

## What are the important components of physical activity for people with chronic lung disease?

8:45 AM - 9:00 AM

Abstract 


### Biography

Mariana is a physiotherapist and a Research Fellow at Monash University. Her research focuses on non-pharmacological treatments for pulmonary fibrosis. She is the clinical trial manager for the PFOX trial - a multicentre randomized controlled trial evaluating the efficacy of ambulatory oxygen in people with fibrotic interstitial lung disease and exertional desaturation.

**Dr Mariana Hoffman**  
Research Fellow  
Monash University

## Strong Lungs: a website for First Nations with bronchiectasis

9:00 AM - 9:15 AM

Abstract 


### Biography

Annemarie Lee is an Associate Professor at Monash University. Her current research areas include physiotherapy for bronchiectasis, in airway clearance therapy and exercise, and the clinical impact of comorbidities.

**Assoc Prof Annemarie Lee**  
Associate Professor  
Monash University

## Comparison of Different Oximetry Devices during Six-Minute Walk Tests

9:15 AM - 9:30 AM

Abstract 

## User experiences of pulmonary rehabilitation: home-based with mHealth or centre-based.

9:30 AM - 9:45 AM

Abstract 

### Biography


Hannah Rutherford has a background in respiratory physiotherapy and pulmonary rehabilitation. She is currently a postgraduate research student with the School of Health Sciences at the University of Sydney and a Virtual Health Clinical Change Manager at South Eastern Sydney Local Health District.

**Ms Emma Marshall**  
Honorary Research Assistant  
Institute of Breathing and  
Sleep

**Ms Hannah Rutherford**  
Post Graduate Student  
Sydney School of Health  
Sciences / University of  
Sydney

## Lung transplant candidates' quadriceps strength can decouple from other markers of disease progression with targeted exercise training

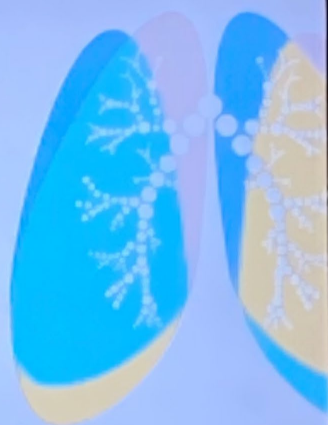
9:45 AM - 10:00 AM

Abstract 

**Dr James Walsh**  
Physiotherapist - Clinical  
Consultant  
The Prince Charles Hospital

## TSANZ SIG Orals: Physiotherapy

Lung transplant candidates' quadriceps strength can decouple from other markers of disease progression with targeted exercise training



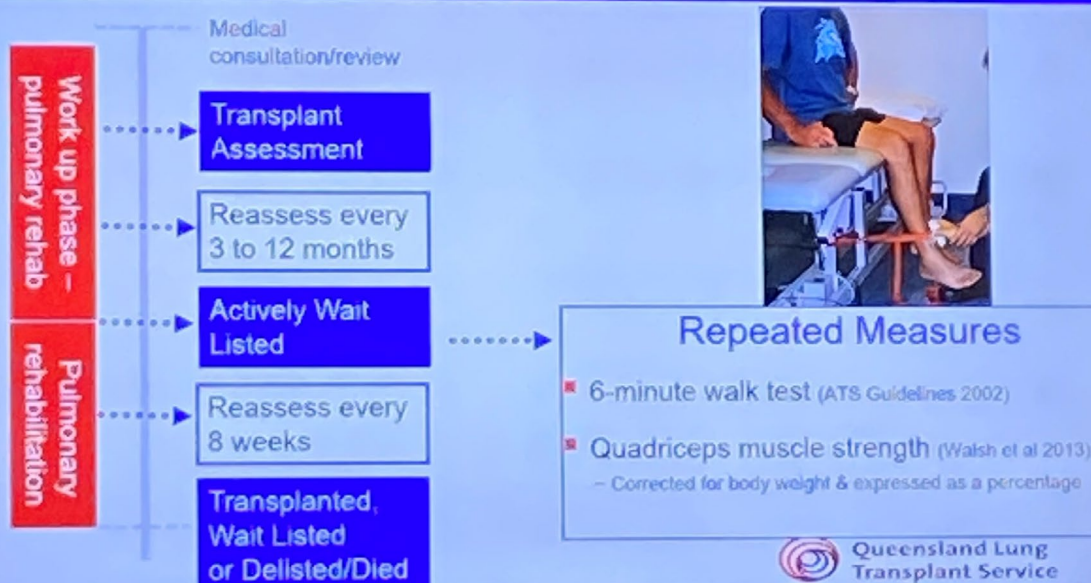
James Walsh

## Study Aim

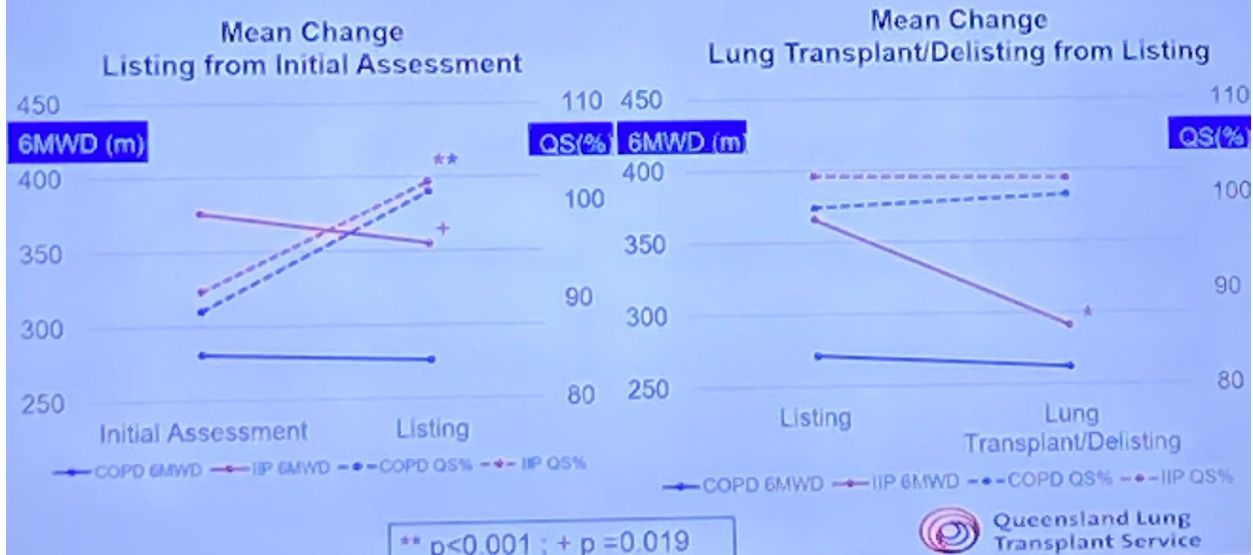
- The study aim was to compare changes in 6MWD and quadriceps strength corrected for body weight (QS%) in candidates with chronic obstructive pulmonary disease (COPD) or idiopathic interstitial pneumonias (IIP)<sup>1</sup> being worked up for and awaiting lung transplantation

<sup>1</sup> Cottin et al European Respiratory Review 2018

## Methods – Timeframe & Measures



## Change in 6MWD and QS%



## TSANZ SIG Orals: Evidence-Based Medicine and Practice

**Dr Angela Burge**

Research Fellow  
Monash University

Breathing exercises for breathlessness in chronic respiratory disease: systematic review

🕒 10:45 AM - 11:00 AM

Abstract 

Biography

Angela is a physiotherapist at the Alfred Hospital and research fellow in the Central Clinical School at Monash University

Addition of breathing techniques to pulmonary rehabilitation did not result in statistically significant improvement in Chronic Respiratory Questionnaire dyspnoea domain at the end of the intervention period (4-12 weeks) compared to pulmonary rehabilitation

**Dr Angela Burge**

Research Fellow  
Monash University

Graded exercise therapy for fatigue in chronic respiratory disease

🕒 11:00 AM - 11:15 AM

Abstract 

GET =fixed incremental increases from established baseline level of exercise/physical activity, excluding pulmonary rehabilitation)  
Some evidence for clinically relevant improvements in fatigue following GET compared to usual care

# Posters

Poster titles and Abstracts available here:

- <https://tcc.eventsair.com/QuickEventWebsitePortal/tsanzsrs24/program/Agenda/AgendaItemDetail?id=d7d8b614-a378-448a-a153-756b22cc7efe>



# American Thoracic Society Pulmonary Rehabilitation Guidelines

TSANZ presentation- Anne Holland & Narelle Cox

## AMERICAN THORACIC SOCIETY DOCUMENTS

### **Pulmonary Rehabilitation for Adults with Chronic Respiratory Disease**

An Official American Thoracic Society Clinical Practice Guideline

Carolyn L. Rochester, Jennifer A. Alison, Brian Carlin, Alex R. Jenkins, Narelle S. Cox, Gerene Bauldoff, Surya P. Bhatt, Jean Bourbeau, Chris Burtin, Pat G. Camp, Thomas M. Cascino, Grace Anne Dorney Koppel, Chris Garvey, Roger Goldstein, Drew Harris, Linzy Houchen-Wolloff, Trina Limberg, Peter K. Lindenauer, Marilyn L. Moy, Christopher J. Ryerson, Sally J. Singh, Michael Steiner, Rachel S. Tappan, Abebaw M. Yohannes, and Anne E. Holland; on behalf of the American Thoracic Society Assembly on Pulmonary Rehabilitation

THIS OFFICIAL CLINICAL PRACTICE GUIDELINE OF THE AMERICAN THORACIC SOCIETY WAS APPROVED MAY 2023



# Methods

- **Multidisciplinary** – 10 Pulmonary/critical care physicians, 1 cardiologist,, 1 internist, 8 physical therapists, 2 nurses, 1 respiratory therapist, 1 exercise physiologist, patient representative with chronic respiratory disease
- **6 PICO questions** most likely to influence clinical practice, public policy, and reimbursement, partic in USA
- Modified Delphi to select **Critical and Important outcomes**
- Used some published systematic reviews used to improve time and efficiency
- **GRADE approach** to appraise quality of evidence and formulate recommendations
- **4 co-chairs**: Carly Rochester, Anne Holland, Jennifer Alison, Brian Carlin
- **4 methodologists**: Anne Holland, Jennifer Alison, Alex Jenkins, Narelle Cox

Question	Recommendation	Strength of recommendation Quality of Evidence
1. Should adults with stable COPD undertake pulmonary rehabilitation?	For adults with stable COPD, we recommend participation in pulmonary rehabilitation	Strong Moderate
2. Should adults with COPD undertake pulmonary rehabilitation following hospitalization for an exacerbation?	For adults with COPD, we recommend participation in pulmonary rehabilitation following hospitalization for exacerbation of COPD	Strong Moderate
3. Should adults with ILD undertake pulmonary rehabilitation?	For adults with ILD, we recommend participation in pulmonary rehabilitation	Strong Moderate
4. Should adults with pulmonary hypertension undertake pulmonary rehabilitation?	For adults with pulmonary hypertension, we suggest participation in pulmonary rehabilitation	Conditional Low
5. Should adults with CRD undertake telerehabilitation?	For adults with stable CRD, we recommend offering the choice of center-based pulmonary rehabilitation or telerehabilitation	Strong Moderate
6. Should adults with CRD undertake maintenance pulmonary rehabilitation?	For adults with COPD, we suggest either supervised maintenance pulmonary rehabilitation or usual care after initial pulmonary rehabilitation	Conditional Low

## 1. Should adults with stable COPD undertake pulmonary rehabilitation?

82 RCTs with 4,674 participants; mean FEV<sub>1</sub> range 26%-75% predicted

	Outcome	Size of Effect (95% CI)		Clinically relevant?
CRITICAL	6-min walk distance	MD 44 metres	33 to 55	✓
IMPORTANT	HRQoL - CRQ Dyspnoea	MD 0.7 pts	0.2 to 1.3	✓
	HRQoL - SGRQ Total	MD -6.8 pts	-9.3 to -4.5	✓
	Adverse events	No SAE in 42 RCTs		✓
	Hospitalisations	Rate ratio 0.76	0.40 to 1.45	



## ATS Recommendation 1.

For adults with stable COPD, we recommend participation in pulmonary rehabilitation (strong recommendation, moderate quality evidence)



High value on improvements in exercise capacity,  
dyspnoea and health-related quality of life

Patients value the benefits of pulmonary rehabilitation

No significant adverse events

Lower value on travel burden, cost and inconvenience



## 2. Should adults with COPD undertake pulmonary rehabilitation following hospitalisation for an exacerbation?

17 RCTs with 1724 participants; mean FEV<sub>1</sub> range 31%-57% predicted

	Outcome	Size of Effect (95% CI)		Clinically relevant
CRITICAL	Hospital readmission	Odds ratio 0.48	0.30 to 0.77	✓
IMPORTANT	6-min walk distance	MD 58 meters	29 to 86	✓
	HRQoL - SGRQ Total	MD -8.7 points	-12.5 to -4.9	✓
	mMRC dyspnoea	MD -0.3 points	-0.5 to -0.1	
	Mortality	Odds ratio 0.75	0.47 to 1.20	
	Adverse events	None reported in 4 RCTs		✓

## ATS Recommendation 2.

For adults with COPD, we recommend participation in pulmonary rehabilitation following hospitalisation for an exacerbation  
(strong recommendation, moderate quality evidence)



High value on reducing hospital readmissions and improving exercise capacity, dyspnoea and HRQoL

Patients value staying out of hospital

No significant adverse events

Lower value on burden of attendance

Original research

Do pulmonary rehabilitation programmes improve outcomes in patients with COPD posthospital discharge for exacerbation: a systematic review and meta-analysis *Thorax* 2024 13: 13.

Alex R Jenkins ,<sup>1</sup> Chris Burtin,<sup>2,3</sup> Pat G Camp,<sup>4,5</sup> Peter Lindenauer,<sup>6</sup> Brian Carlin,<sup>7</sup> Jennifer A Alison,<sup>8,9</sup> Carolyn Rochester,<sup>10,11</sup> Anne E Holland<sup>12,13,14</sup>

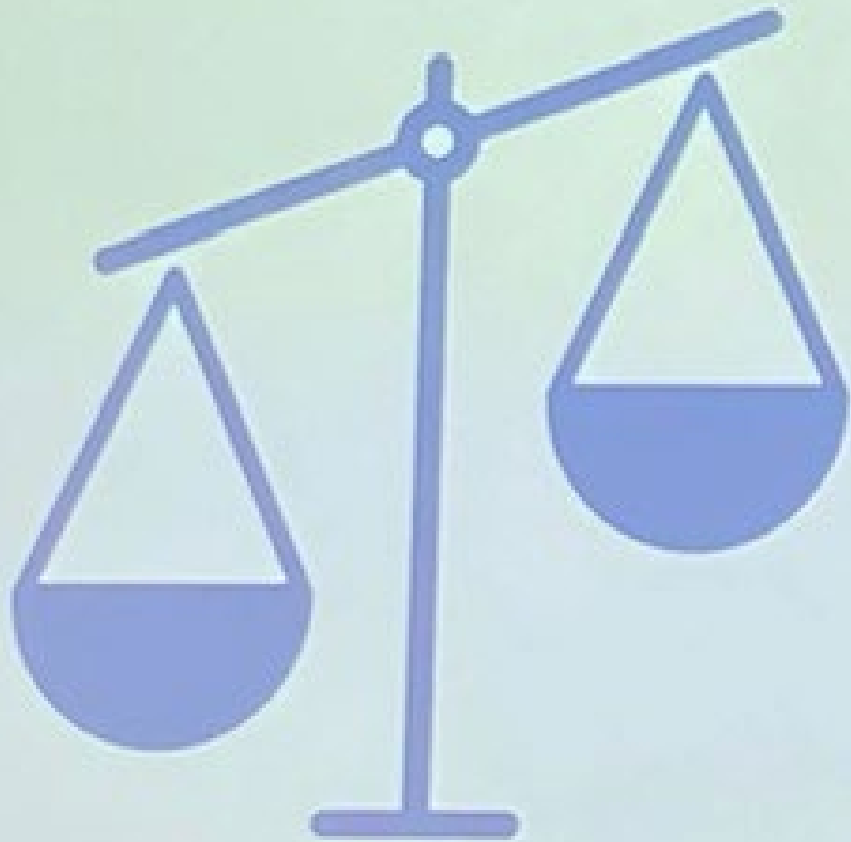
### 3. Should adults with ILD undertake pulmonary rehabilitation?

21 RCTs with 909 participants; mean FVC range 55%-86% predicted

	Outcome	Size of Effect (95% CI)		Clinically relevant?
CRITICAL	6-min walk distance	MD 40 metres	33 to 48	✓
IMPORTANT	HRQoL - SGRQ Total	MD -9.29 pts	-11.1 to -7.5	✓
	mMRC dyspnoea	SMD -0.36 pts	-0.58 to -0.14	✓
	Hospitalisation	Odds ratio 0.99	0.29 to 3.39	
	Mortality	Odds ratio 0.40	0.14 to 1.12	
	Adverse events	No adverse events in 10 RCTs		✓

### ATS Recommendation 3.

For adults with ILD, we recommend participation in pulmonary rehabilitation (strong recommendation, moderate quality evidence)



High value on improving exercise capacity, dyspnoea and HRQoL

These outcomes are likely important to patients

No significant adverse events

Lower value on burden of travel, cost and inconvenience



## 4. Should adults with pulmonary hypertension undertake pulmonary rehabilitation?

14 RCTs with 571 participants; mean PAP range 36 to 59 mmHg

	Outcome	Size of Effect (95% CI)		Clinically relevant?
CRITICAL	6-min walk distance	MD 49 metres	34 to 64	✓
IMPORTANT	HRQoL - SF-36 Physical	MD 4.20 pts	1.43 to 6.98	✓
	Dyspnoea	No data		
	Functional class	MD -0.60 pts	-0.85 to -0.35	
	Adverse events	Risk diff 0.01	-0.02 to 0.04	✓
	Mortality	No deaths reported		

## ATS Recommendation 4.

For adults with pulmonary hypertension, we suggest participation in pulmonary rehabilitation

(conditional recommendation, low quality evidence)



Low quality evidence for improvements in exercise capacity and HRQoL

These outcomes are likely important to patients

No significant adverse events in a supervised program  
where staff have expertise in PH

Patients should be stabilised on medical therapy

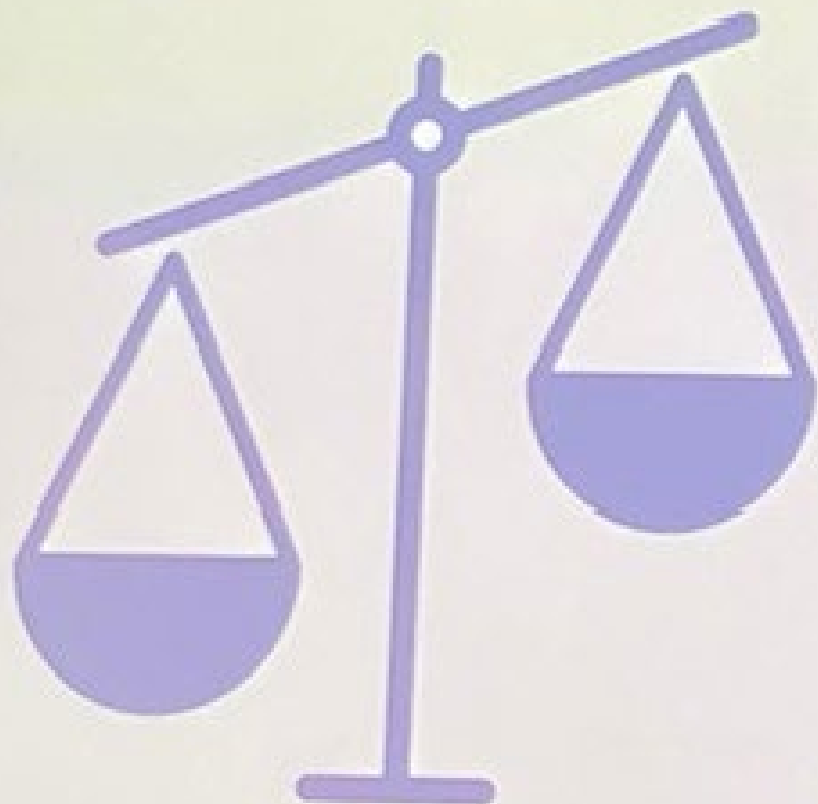
## 5. Should adults with chronic respiratory disease undertake Telerehabilitation?

5 RCTs and 2 CCTs, 1199 participants; comparison = centre-based

	Outcome	Size of Effect (95% CI)		Clinically relevant
CRITICAL	6-min walk distance	MD 0.06 metres	-11 to 11	
IMPORTANT	HRQoL - SGRQ Total	MD -1.26 pts	-3.97 to 1.45	
	HRQoL- CRQ Dyspnoea	MD 0.13 pts	0.13 to 0.40	
	Program completion	Odds ratio 5.36	2.12 to 9.21	✓
	Hospitalisation	Odds ratio 0.65	0.43 to 0.99	
	Adverse events	Similar to centre-based		

## ATS Recommendation 5.

For adults with stable chronic respiratory disease, we recommend offering the choice of centre-based pulmonary rehabilitation or telerehabilitation (strong recommendation, moderate quality evidence)



Similar gains in exercise capacity, HRQoL and dyspnoea

Patients value the convenience and flexibility of telerehabilitation

Not a replacement for centre-based programs

Optimal telerehabilitation model not clear

Most trial participants had COPD



## 6. Should adults with chronic respiratory disease undertake maintenance pulmonary rehabilitation?

21 RCTs with 1799 participants; mild to very severe COPD

	Outcome	Size of Effect (95% CI)		Clinically relevant?
CRITICAL	6-min walk distance	MD 26 metres	-1 to 53	
IMPORTANT	HRQoL - CRQ Dyspnoea	MD 0.3 pts	-0.5 to 1.1	
	HRQoL - SGRQ Total	MD -1.6 pts	-4.9 to 1.8	
	Adverse events	None in 6 RCTs		✓
	Hospitalisations	Risk ratio 0.74	0.41 to 1.37	

## ATS Recommendation 6.

For adults with COPD, we suggest either supervised maintenance pulmonary rehabilitation or usual care after initial pulmonary rehabilitation (conditional recommendation, low quality evidence)



Ongoing, regular exercise important for all patients

Inconsistent evidence for improvements in exercise capacity and HRQoL at 6-12 months

Many people with COPD value ongoing supervised exercise and support

Choice depends on needs, capabilities and preferences of individuals, and local access

# Research Needs in Pulmonary Rehabilitation



## Disease specific

- PR for early stage COPD
- Interventions to improve HCP referral to PR
- Optimal PR timing post COPD exacerbation
- Improving PR uptake post COPD exacerbation
- Impact of PR on exacerbations for non-COPD
- New exercise training strategies for ILD
- PR for PH 2<sup>o</sup> to lung or left heart disease
- PR for severe PH



## PR models

- Treatable traits approach to PR
- PR for low and middle income countries
- Culturally adapted PR models
- Optimal model for maintenance PR
- Role of physical activity promotion
- Telerehabilitation after exacerbations
- Telerehabilitation for non-COPD CRDs
- Which PR model for which patient

Optimal program components, structure and duration

Long term outcomes

Cost effectiveness