2026 California Thoracic Society Annual Educational Conference

& Chronic Obstructive Pulmonary Disease Symposium

Thursday March 12, 2026-Sunday March 15, 2026

Earn up to 19 CME/CEU/MOC Credits

Jointly Provided by AKH Inc., Advancing Knowledge in Healthcare and the California Thoracic Society

PORTOLA HOTEL & SPA
AT MONTEREY BAY

Thursday March 12, 2026 (6 CME/CEU/MOC Credits)
COPD Symposium
Friday March 13, 2026 (6.5 CME/CEU/MOC Credits):
Advances in Interventional Pulmonary, Remote Monitoring in Pulmonary and Sleep Medicine, Approach to Symptom Management in Chronic Lung Disease and Critical Care
Saturday March 14, 2026 (6.5 CME/CEU/MOC Credits)
Sepsis and Shock, Extracorporeal Membrane Oxygenation, Inpatient Pulmonary Complications of Cancer Care
Sunday March 15, 2026
Fellow and Resident Track Symposium

California Thoracic Society
ATS Chapter Serving California and Arizona

AKH INC.
ADVANCING KNOWLEDGE IN HEALTHCARE

California Thoracic Society
Annual Conference
March 12-15, 2026
Portola Hotel and Spa, Monterey, CA

Friday March 13, 2026

Advances in Interventional Pulmonary

8:00 am – 8:10 am: Welcome and Introduction

8:10 am – 8:55 am: Keynote Address – Evolution of Bronchoscopy in Diagnosing Lung Nodules

- **Christine Argento, MD (Johns Hopkins) -** This speaker will discuss the recent advances in bronchoscopy from radial EBUS, to electromagnetic navigation, to robot technologies, and how advancement has improved lung nodule diagnosis.

8:55 am – 9:20 am: Implications of the new TNM9 staging for lung cancer

- **Colleen Channick, MD (UC Los Angeles) -** This speaker will discuss the new TNM staging system, how staging is currently performed, and how to approach staging in the patient with suspected lung cancer.

9:20 am – 9:45 am: Management of Central Airway Obstruction

- **Raed Alalawi, MD (Arizona-Phoenix)-** This speaker will discuss how interventional pulmonary practitioners can manage and treat central airway obstruction.

9:45 am – 10:10 am: The Changing Landscape of Pleural Disease Management

- **Joon Chang, MD (Stanford) -** This speaker will discuss advances in management of pleural disease by the interventional pulmonologist including when to use an intrapleural catheter, and when to use

10:10 am – 10:20 am: Question and Answer

10:20 am – 10:50 am: Break

Remote Monitoring in Lung Disease and Sleep Medicine

10:50 am – 11:15 am: Developing a home spirometry program

- **Steven Hays, MD (UC San Francisco) -** This speaker will discuss how to approach the development of a home spirometry program to monitor lung disease, how to use digital health technologies to integrate results into the EHR.

11:15 am – 11:40 am: Home Non-Invasive Ventilator Monitoring

- **Christal Hawkins, RRT (UC San Diego) -** This speaker will review how to monitor home non-invasive ventilators for compliance and for adequate control of sleep disordered breathing.

11:40 am – 11:55 am: Pro: Virtual Pulmonary Rehabilitation is Ready for Prime Time

- **Aimee Kizziar, RRT (UC Davis) -** This speaker will argue in favor of virtual pulmonary rehabilitation programs.

11:55 am – 12:10 pm: Con: Virtual Pulmonary Rehabilitation is not ready for Prime Time

- **Julia Rigler, BA. RRT (UC San Francisco) -** This speaker will argue against virtual pulmonary rehabilitation programs.

12:10 pm – 12:20 pm: Question and Answer

12:20 pm – 1:00 pm: Awards Ceremony

1:00 pm – 2:00 pm: Lunch

Hands On Session:

2:00 pm – 3:00 pm: Robotic Bronchoscopy **Raed Alalawi, MD (Arizona-Phoenix) & Joon Chang, MD (Stanford)** Cough Monitoring **Lauren Eggert, MD (UCSF)**; Endobronchial Ultrasound **Pranjal Patel, MD (Stanford)**; Home NIV **Krystle Leung, MD (Stanford)**

3:00 pm – 3:20 pm: Break

Approach to Symptom Management in the Pulmonary Patient

3:20 pm – 3:45 pm: Addressing the Unmet Needs of Refractory Chronic Cough

- **Krishna Sundar, MD FCCP FAASM ATSF (UC Davis) -** This speaker will discuss the etiology behind refractory chronic cough and the treatment approaches for management

3:45 pm – 4:10 pm: Frailty in Pulmonary and Critical Care Medicine

- **Jonathan Singer, MD MPH (UC San Francisco) -** This speaker will discuss the concept of frailty and how it impacts health in patients with lung disease. The speaker will also discuss how frailty can change as lung disease is treated.

4:10 pm – 4:35 pm: Palliative Care for the Patient with Chronic Lung Disease

- **Grace Amadi, MD (UC Davis) -** This speaker will discuss how palliative care teams can benefit patients with chronic various lung disease including ILD, COPD, and pulmonary hypertension.

4:35 pm – 5:00 pm: Palliative Care for the Patient with Critical Illness

- **B. Corbett Walsh, MD, MBE (UC Los Angeles) -** This speaker will discuss how palliative care teams can benefit the inpatient with advancing lung disease, the importance of advance care planning, and palliative care in the intensive care unit.

5:00 pm – 5:10 pm: Question and Answer

5:30 pm – 7:00 pm: Women in Pulmonary, Critical Care, and Sleep Medicine (NON-CME) – Food and beverages will be served

Aimee Kizziar is the Supervisor of the Pulmonary Rehabilitation program at UC Davis Health in Sacramento, CA, and has been a dedicated respiratory therapist since 1998, with 16 years of experience in acute care settings such as the Emergency Department and NICU. Over the past decade, she has specialized in pulmonary rehabilitation and actively contributed to the field through authorship, presentations, and leadership roles in various professional organizations. Her extensive involvement includes positions on AACVPR committees, the California Society of Pulmonary Rehabilitation (CSPR), and the American Thoracic Society PR Reimbursement committee, where she has worked on program certification, advocacy, reimbursement, and education.

Pro: Virtual Pulmonary Rehabilitation Is Ready for Prime Time

Aimee Kizziar, MHAL, RCP, RRT-NPS, AE-C, CES, FAACVPR

UCDH Pulmonary Rehabilitation Program Supervisor

Disclosures

- I have no disclosures pertaining to this topic.

Outline

- Definitions
- Current State
- Why we need Virtual PR
- Evidence for Virtual PR

Definition of Pulmonary Rehabilitation (ATS/ERS)

"A comprehensive intervention based on thorough patient assessment followed by patient-tailored therapies which include but are not limited to exercise training, education, and behavior change. The goal of PR is to improve the physical and emotional condition of people with chronic respiratory disease and to promote long-term adherence to health enhancing behaviors."

ATS/ ERS, 2013; AACVPR Consensus Statement 2025

ATS/ERS 2015 Policy Statement to 2023 CPG

- Recent years alternative models of PR have emerged that aim to improve access and uptake including telerehabilitation and low-cost home-based models.

ATS/ERS 2015 Policy Statement challenged the PR community to conduct research that tests alternative models of providing PR;

- "Further research should be undertaken to advance EB policy in PR including further investigation regarding cost effectiveness of PR for CRD, innovative models for PR delivery that will improve patients' access and uptake and the barriers and facilitators of PR program referral, accessibility, enrollment and adherence."

ATS PR Clinical Practice Guidelines 2023:

- Adults with stable chronic respiratory disease should be offered choice of center-based PR or telehealth PR – moderate quality evidence

COVID-19 pandemic accelerated the adoption of VPR in U.S.

ATS 2015; ATS 2023

Definitions of Alternative Delivery Models of PR

- **Traditional "In-Center" Delivery - Synchronous**
  - Patient and PR professional are in the **same location/same time.**
- **Virtual Delivery - Synchronous**
  - **Two-way, audio-visual communication**
  - Patient and PR professional are **not in the same location**
  - PR professional observes patient in real-time using an audio-visual platform
- **Remote Delivery - Asynchronous**
  - Communication occurs outside the exercise session
  - Patient submit **logged data, such as exercise and/or vital signs or symptoms** via phone or digital tool
  - May include periodic **in-person, video or telephone encounters**
- **Hybrid Delivery**
  - Combines two or more of the delivery methods:
    - **Traditional "In-Center" Delivery**
    - **Virtual Delivery - Synchronous**
    - **Remote Delivery - Asynchronous**

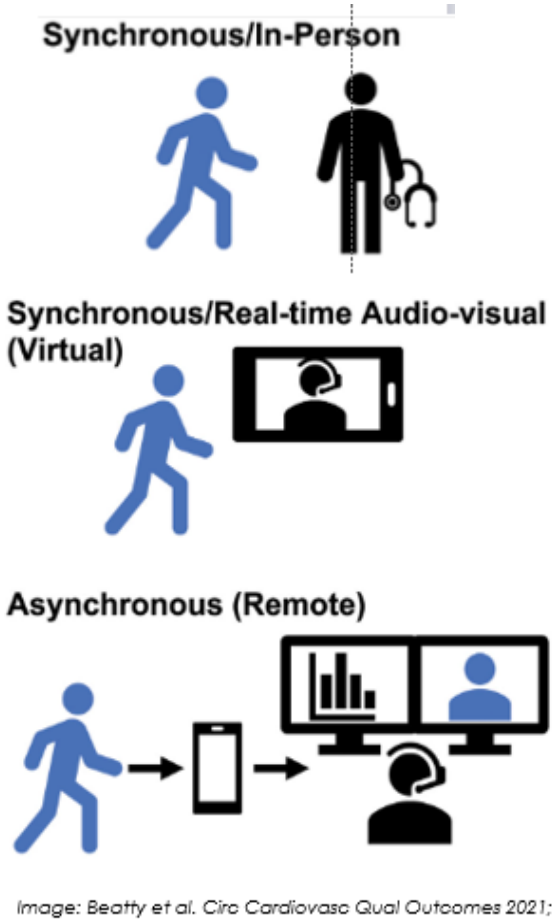
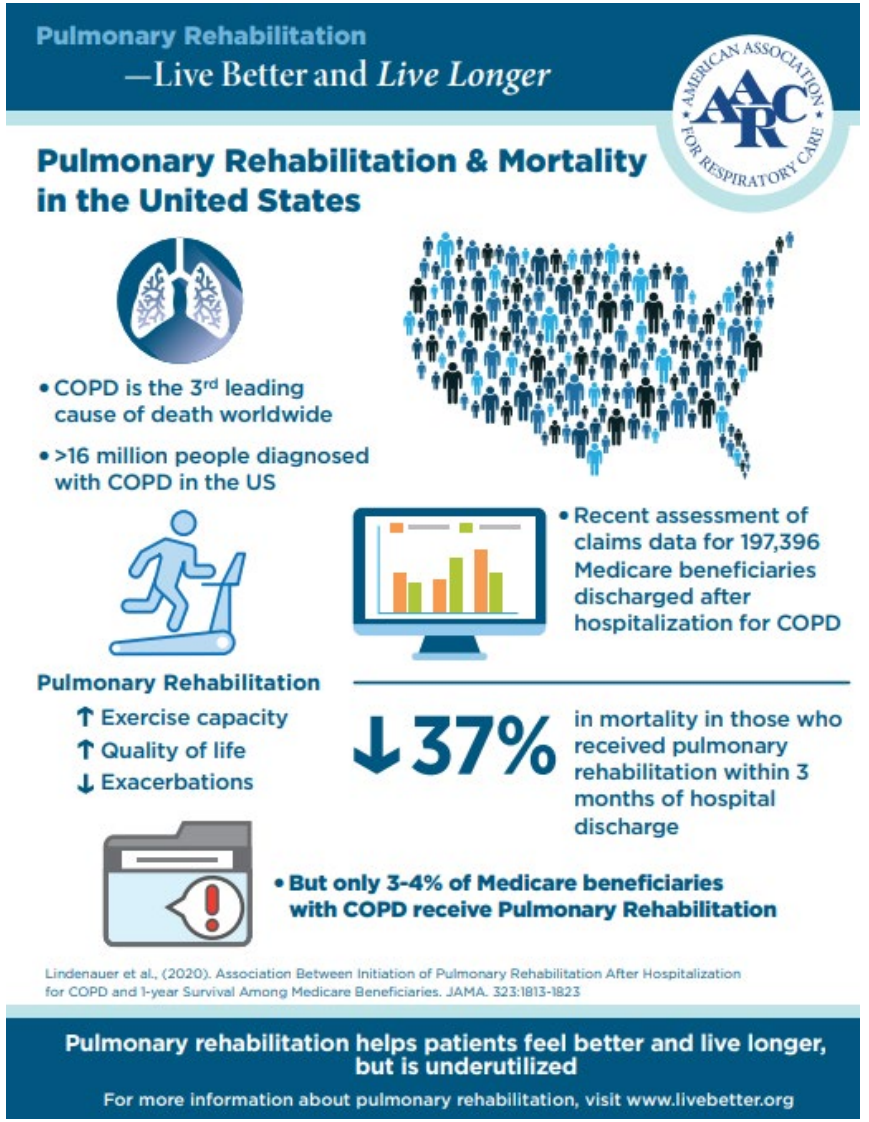


Image: Beatty et al. Circ Cardiovasc Qual Outcomes 2021; 14:e008215

Overwhelming Evidence of the Benefits for PR

- ✓ Improved exercise capacity/tolerance (Spruit, 2022)
- ✓ Improved symptoms of dyspnea (Spruit, 2022)
- ✓ Improved HRQOL (Spruit, 2022)
- ✓ Safe for COPD and other chronic respiratory diseases (Rochester, 2023)
- ✓ Decreases post-hospitalization readmissions (Stephan, 2021)
- ✓ Cost savings to health care system (Mosher, 2022)
- ✓ Improves survival (Lindenauer, 2020 & Choi, 2024)

The question isn't whether PR works, but how can we ensure more people can actually receive it.



Pulmonary Rehabilitation proven to be Highly Effective, Yet Underutilized

- Even though Pulmonary Rehabilitation is a highly effective treatment for people with chronic respiratory disease it remains underused across the world. (Rochester, 2023)
- In the U.S.
  - Less than 4% of Medicare members with COPD receive PR (Nishi, 2019)
  - Less than 10% receive PR following discharge for acute exacerbation of COPD (Spritzer, 2022)
- Barriers include **availability, access and attrition.**

Rochester, Nishi, Spritzer

Why we need VPR – Improve Accessibility

Malla et al. (Ann ATS 2023), evaluated PR access among Medicare beneficiaries with COPD.

40% of adults w/COPD have poor access to PR

Rural areas **~ 89%** have poor access

Commute burden grows quickly with increase distance:

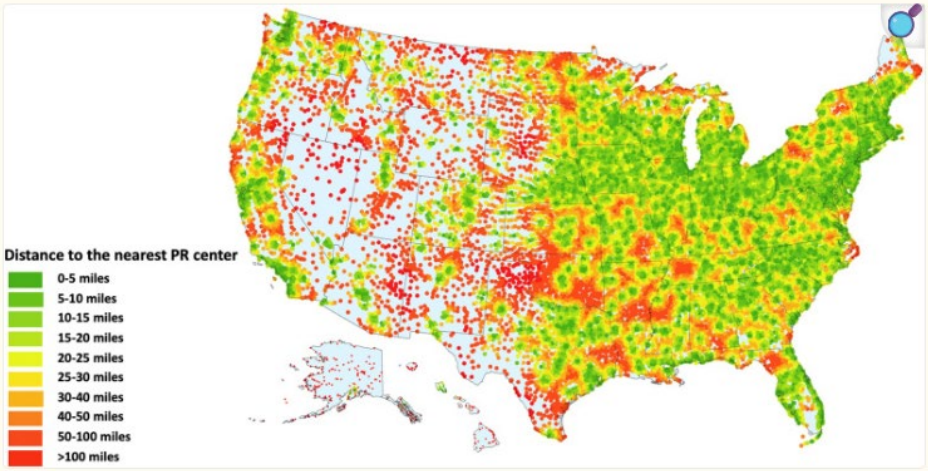
- 15 miles = **73.2%** access
- 25 miles = **86.6%** (~ 45-60 minutes in traffic)
- 50 miles = **97.1%** (unrealistic for routine attendance)

Rural Patient Reality

- Within 10 miles = **11.3%**
- Within 15 miles = **24.3%**
- Within 25 miles = **53.4%**
- Within 50 miles = **88.6%** (2-hour round trip)

Virtual PR removes the distance barrier entirely.

Figure 3.



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Availability of pulmonary rehabilitation (PR) centers among Medicare beneficiaries with chronic obstructive pulmonary disease across the United States, 2018. PR center information is for 2020, and Medicare data are for 2018.

Access to Pulmonary Rehabilitation among Medicare Beneficiaries with Chronic Obstructive Pulmonary Disease. Ann Am Thorac Soc. 2023 Apr;20(4):516-522

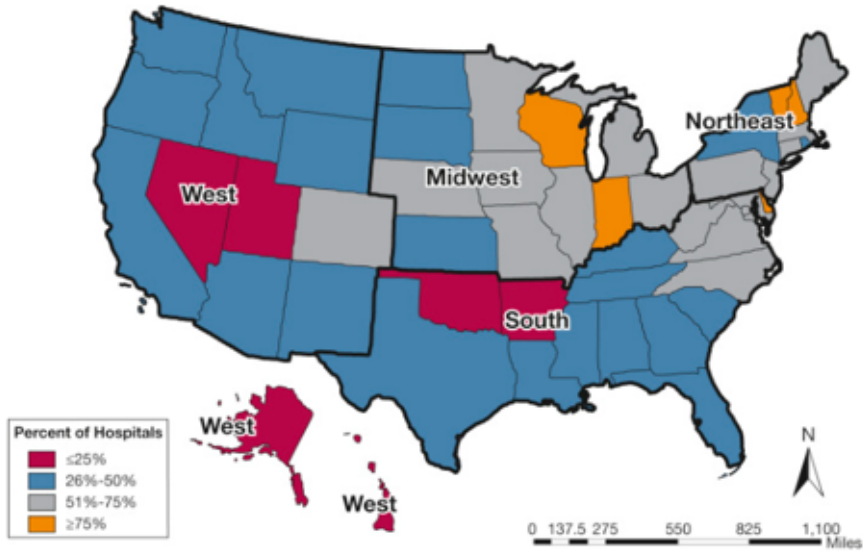
Why we need VPR – Improve Availability

The supply of CBPR is nowhere near adequate to meet national needs.

- **56.5% of US counties & 73% of rural counties** - lack a CBPR program.
- **~1,700 PR programs serve ~ 14 million eligible COPD patients**
- Equates to **~ 6,030 COPD patients/center**
- A typical PR program treats **40 to 75 individuals/year.**

Virtual PR expands reach without relying on brick-and-mortar capacity.

The percent of hospitals with an outpatient PR program also varies significantly by Census region, with the Northeast (52.7%) and the Midwest (61.7%) being much more likely to have programs than the South (39.0%) and the West (35.5%) ($P < .0001$). The percent of hospitals with a PR program by state ranges from 4.6%to 85.7%. Figure 1 shows the distribution for all states by quartile.



Disparities in Geographic Access to Hospital Outpatient PR Programs in the US.

Moscovice, et al. Chest, 2019

Malla, AATS 2023 April; Moscovice, Chest 2019. **Bhatt, Casaburi, 2024**

Why we need VPR – Improve Uptake and Completion Rates

Low Uptake

- **<4%** of COPD patients participate in PR programs.
- **>50%** of referred patients decline to participate.
- **Barriers to starting:**
  - Distance/Transport difficulties
  - Inconvenient locations
  - Socioeconomic challenges
  - Poor referral practices and lack of patient awareness
  - Fear, uncertainty, or misunderstanding of benefits

Low Completion Rates

- Completion ranges **26–36%** in some studies;
- **~ 50%** in others
- **Reasons for non-completion:**
  - Comorbidities, high symptom burden, low baseline exercise tolerance
  - Exacerbations, hospitalizations, other competing medical appointments
  - Personal disruptions, work schedules, caregiving demands
  - Financial barriers (copays, gas, parking)
  - Psychological Factors (anxiety, depression, low motivation)

Virtual PR directly addresses many of these barriers by reducing travel, increasing convenience and improving feasibility for high-burden patients.

Virtual PR Pro: Clinical Effectiveness

Data to support PR outside the confines of rehabilitation center

Uzzaman, et al 2022. Effectiveness of home-based pulmonary rehabilitation: Systematic review and meta-analysis. 16 studies (1,800 COPD patients; 11 countries)

Home-based PR vs usual care

- 6MWD (4 RCT) showed an average increase of 61.6 m
- Dyspnea (2 RCT) showed CRQ improved by 0.7units
- HRQOL (3 RCT) showed SGRQ improved by 5.7 units

Home-PR vs CBPR

- 6MWD (7 RCT; n=823): No significant difference
- Cycling endurance, ISWT: Non-inferior
- CQR Dyspnea (4 RCT; n=762): Similar improvements
- CAT (HRQOL): modest improvements in both groups

Uzzaman, 2022

Virtual PR Pro: Clinical Effectiveness

Cox et al., 2021. Cochrane Review

15 studies – 1904 participants, 99% COPD.

5 models of telerehabilitation studied

3 were controlled clinical trials

VPR vs Usual Care

- 6MWD (2 RCTs): showed improvements of 22.2 m
  - Maintenance rehab – improvements of 78.1 m
- Dyspnea (2 RCTs): showed CRQ +2 units
- QOL (3 RCTs): showed SGRQ -4 units

VPR vs CBPR

- 6MWD (4 RCTs): showed increases 8 - 73 m
  - Overall difference: -6.3 m = little or no difference
- Dyspnea (2 RCTs): showed CRQ +2 units
- QOL (3 RCTs): showed SGRQ -4 units

Cox et al., 2021

Virtual PR Pro: Improves Access and Equity

Expands reach to rural and underserved populations

- Nearly 30% of the American Indian and Alaska Native population lives more than an hour away from the closest program. Kahn & Mathis

Alwakeel, M. et al. (AATS. 2022) - *Canadian community-based tele-PR* over 3 years.

- *Tele-PR* reached more patients than the central PR sites
- Enrollment doubled
- Session attendance quadrupled
- Completion rates were higher ~83% vs 72% (center)

Wan, E. et al. (Chest 2025) *Safety and Feasibility of a Two-Way Audiovisual Teleconferenced PR*

- Median distance: 34.1 miles (VPR) vs. 10.3 miles (in-center)
- Travel time: 86 min vs. 51.4 min

VPR improves equity by bringing high-quality rehabilitation to patients who otherwise cannot access CBPR.

Kahn & Mathis, ATS; Alwakeel; Wan

Virtual PR Pro - Adherence and Retention

Cochrane Review (Cox, et al., 2020)

- 93% completion rate in telerehabilitation vs 70% completion rate in-person rehabilitation.
- Indicates higher participation engagement and lower dropout rates

Holland & Cohort Data, 2013:

Tele-PR programs generally show higher adherence and completion, especially when:

- technology is simple
- patients receive brief training/support
- sessions follow a structured schedule

Cox, et al. 2021

Virtual PR Pro: Safety

Alwakeel, et al., 2022 – 3-Year community-based tele-Pulmonary Rehab safety and feasibility study

- Standardized community-based tele-PR for COPD
- Adverse events and dropouts tracked by each center
- Major events monitored (injury, falls, death)
- No major adverse events reported

Cochrane Review (Cox, et al., 2020)

- No safety issues were identified, and other studies report low adverse event rates, often with 100% of participants feeling safe exercising at home.

Filizola, H., (2025). Outcomes of Virtual Pulmonary Rehabilitation in Oxygen-Dependent COPD Patients. *Journal of the COPD Foundation.*

- Study of 167 COPD patients (oxygen-dependent vs non-oxygen).
- Attendance 88% across both groups.
- Adverse events extremely rare (~1%), confirming safety.
- Both groups showed significant improvements in dyspnea, depression, CAT score, mMRC, PHQ-9, and 1-minute sit-to-stand test.
- No difference in outcomes between oxygen-dependent and non-oxygen group

Virtual PR is safe when proper patient selection and monitoring protocols are followed, telerehabilitation shows no increased risk compared to center-based PR.

Alwakeel, 2022; Filizol, 2025

Virtual PR Pro: Safety Standards Matter

Bhatt, et al. 2022 emphasize that risk stratification, monitoring and emergency planning – not physical location – determine safety.

AACVPR Consensus Statement, 2025 - Virtual PR is considered safe when delivered with:

- Appropriate patient selection
- Clear monitoring protocols
- A defined emergency response plan

Bhatt, S, 2022

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Virtual PR Pro: Cost-Effectiveness

Lower direct costs

- Reduced transportation expense for patients

Healthcare System Savings

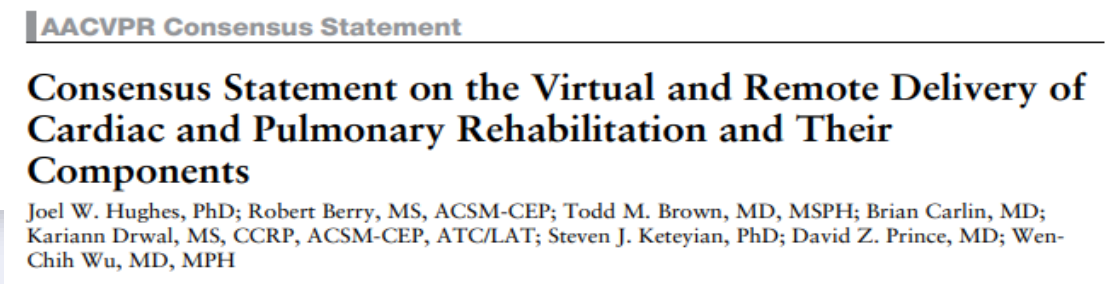
- Lower facility and staff overhead for programs
- Potential for fewer hospital readmissions
  - Meta-analysis suggests telerehabilitation might reduce respiratory-related hospitalizations compared to center-based care
- Reduced emergency visits
- Lower long-tern COPD care burden
- Sustained benefits with long-term supervised telerehabilitation (maintained exercise capacity + reduced acute care use)

Integrating VPR into care pathways may generate meaningful cost savings by preventing costly hospital episodes and eliminating travel-related expenses.

Mosher, et al., 2022

Virtual PR Pro: AACVPR Consensus Statement on VPR and Remote

- Definition of Virtual and Remote Delivery Models
- Characteristics association with various Models for Delivery
- Core Components of Pulmonary Rehabilitation
- Performance, Quality and Outcome Measures.
- Patient Selection criteria/Safety/In-person vs Virtual/Remote
- Indications for follow up/Medical Director involvement
- Exercise Prescription
- Technical Requirements/Delivery Core Components using Technology
- Medical Emergencies in Virtual and Remote delivery
- Future Directions


AACVPR Consensus Statement

Consensus Statement on the Virtual and Remote Delivery of Cardiac and Pulmonary Rehabilitation and Their Components

Joel W. Hughes, PhD; Robert Berry, MS, ACSM-CEP; Todd M. Brown, MD, MSPH; Brian Carlin, MD; Kariann Drwal, MS, CCRP, ACSM-CEP, ATC/LAT; Steven J. Keteyian, PhD; David Z. Prince, MD; Wen-Chih Wu, MD, MPH

Virtual PR Pro: CMS Reimbursement Coverage through 2027

Congress passed the Consolidated Appropriations Act of 2026

- Reinstated virtual delivery of CR/ICR/PR services from HOPD-based programs to patient who are in their home at the time the services are delivered.
- Extended COVID-19 era telehealth flexibilities that allow physician-office based programs to provide CR/ICR/PR services to patients who are in their homes at the time the services are delivered.
- For both locations, these services must use delivered using real-time, continuous, 2-way audio-visual communication.
  - Audio-only or asynchronous (remote only) services are not covered.
- Currently expires on December 31, 2027
- **This is in alignment with ATS/AACVPR reimbursement policy updates**

Key Takeaways

- **Virtual Pulmonary Rehabilitation is not designed to replace center-based PR — it is designed to *expand* PR.**
- **The evidence is clear: both models are effective, both are safe, and both improve exercise tolerance, symptoms, and quality of life**. But no single model fits every patient. Some patients need the structure, equipment, and supervision of in-center PR. Others cannot attend reliably due to geography, transportation, mobility, or competing responsibilities.
- For them, virtual PR may be the *only* way they can access an intervention that saves lives.
- The real strength of modern pulmonary rehabilitation is not choosing one model over another — it's having **multiple evidence-based options** and matching the right program to the right patient at the right time.
- So, the takeaway is simple:
  Virtual PR is an essential adjunct to center-based PR. Together, these models allow us to reach more patients, deliver more equitable care, and ensure that no one is denied rehabilitation because of where they live or what barriers they face.
- This is how we move PR forward — by expanding access, not limiting it.

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