Multi-Disciplinary Approach in Pulmonary Rehab

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Improving People's Lives through innovations in personalized health care

Wexner Medical Center
Disclosure

I DO NOT have any significant or other financial relationships with industry or commercial supporters to disclose.

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What is Pulmonary rehabilitation?

According to the American Thoracic Society and the European Respiratory Society...

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

Healthcare professional are team members
Interdisciplinary Team

- Exercise Physiologist
- Respiratory Therapist
- Nurse
- Pulmonologist
Multidisciplinary Approach to Rehab

Smoking Cessation
Multidisciplinary Approach to Rehab

Pathophysiology of chronic lung disease
Multidisciplinary Approach to Rehab

Medications
Multidisciplinary Approach to Rehab

Breathing Retraining
Multidisciplinary Approach to Rehab

Infection Control
Multidisciplinary Approach to Rehab

Psychosocial Support

- Being active
- Pursuing hobbies
- Participating in faith-based activities or meditating
- Attending support groups
Multidisciplinary Approach to Rehab

Nutrition
Hydration

Water’s effect on the Body

- Moistens tissues such as those in the mouth, eyes and nose
- Protects body organs and tissues
- Helps prevent constipation
- Helps dissolve minerals and other nutrients to make them accessible to the body
- Regulates body temperature
- Lubricates joints
- Lessens the burden on the kidneys and liver by flushing out waste products
- Carries nutrients and oxygen to cells
Multidisciplinary Approach to Rehab

Benefits of Exercise
Respiratory Fitness

- Promotes oxygen into the body while removing unwanted carbon dioxide
- Helps mobilize bronchial secretions (Preventing infections)
- Efficient breathing
Oxygen
Good lungs = Breath of life
Life Begins with the Cell
Mitochondria
Progressive Overload

**Applies to all aspects of fitness:** For improvements to occur the body must work harder than what it is used to. When the body begins to adapt to a workload, the intensity must be increased to continue to notice improvements.
Exercise Prescription

- ACSM Aerobic Guidelines
- FITT principle
  - Frequency: 3 days/week
  - Intensity: 40%/50% - 80% 6MW Distance
  - Time: >20-60 min (Endurance training)
  - Type: dynamic activities/large muscle groups
    - Important to incorporate resistance training and flexibility
- Progression is determined by patient tolerance (RPE/RPD), functional capacity, motivation
  - Titrate O2 to maintain sats >88%
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Benefits of Interval Training

**ATP-CP**: Energy stores inside the cells last only a few seconds after starting exercise.

ATP now must be provided by other metabolic pathways:

1. Anaerobic (Red)
2. Aerobic/oxidative (Green)
Interval Training Protocol

- Focus points:
  - 1. Duration of each interval
  - 2. Intensity of each interval

- Performing intervals 2 sessions per week for a duration of 20 to 25 minutes.
  - Low/High intensity

- 1 session per week walk at a constant pace for a duration of up to 30 minutes. (4-6 on Borg Scale)

- Every interval session and the workloads chosen are based on the RPE scale and noticeable symptoms.
Interval Example

- 2 speed Interval TM workload Example;
  - 2.3 MPH @ 0% Incline (Low Intensity) 2-4 RPE
  - 2.7 MPH @ 0% Incline (High Intensity) 4-7 RPE

1. 3 minutes @ 2.3 mph @ 1.5%
2. 2 minutes @ 2.5 mph @ 1.5%
3. 5 minutes @ 2.7 mph @ 1.5%
4. 1 minutes @ 2.5 mph @ 2%
5. 1 minutes @ 2.9 mph @ 1%
6. 3 minutes @ 2.5 mph @ 1%
7. 1.5 minutes @ 2.9 mph @ 1%
8. 5 minutes @ 2.8 mph @ 2%
9. 2 minutes @ 2.5 mph @ 2%
10. Cool down
Why the Core matters

Core helps strengthen the body from the inside out NOT the outside in.

Posture is the key:

Stability  Flexibility  Strength
Respiratory Muscles

Figure 1.7 The breathing pump muscles.
Zone of Apposition

Zone of Apposition  
Optimal ZOA  
Sub-Optimal ZOA
Nervous system

The Motor Unit

Motor neuron
Branches of motor neurons
Myofibrils
Muscle fiber
Mitochondrial dysfunction and Comorbid Conditions

- ~500 total patients from 1/13-10/15
- Average of 8 comorbid conditions
  - Pulmonary Hypertension
  - Hypertension
  - Osteoporosis
  - Cognitive impairment
  - Diabetes
  - Infections (Fungal/viral)
  - Psychological disturbances
  - Cardiovascular disease (CVD)
  - Muscular Weakness/Exercise Intolerance
THE DIAPHRAGM HAS DUAL ROLES: RESPIRATION & POSTURE/STABILITY. DYSFUNCTIONAL BREATHING DECREASES THE DIAPHRAGM'S FUNCTION AS A LUMBO-PELVIC STABILIZER.

INHALE THROUGH NOSE WITH TONGUE ON ROOF OF MOUTH (4 SECONDS)

BALLOON IN LEFT HAND

PAUSE (5G) - THEN REPEAT CYCLE

EXHALE THROUGH MOUTH INTO BALLOON (8G)

* AFTER 1ST BREATH TRY TO INHALE WITHOUT PINCHING OFF BALLOON - THIS REQUIRES INTRA-ABDOMINAL PRESSURE TO PREVENT AIR COMING BACK OUT OF BALLOON & INTO MOUTH

FLAT BACK, HIPS & KNEES FLEXED TO 90 DEGREES

KNEES HIP WIDTH APART


EXERCISE ADAPTED FROM POSTURAL RESTORATION INSTITUTE (PRI).
Other professional area that may impact Pulmonary Rehab outcomes

- Massage therapy
- Deep Tissue
- Trigger points therapy
Review

What are the benefits of interval training?

a. Improved aerobic pathway
b. Improved anaerobic pathway
c. Reduced hyperinflation
d. All of the above
Review

What makes Pulmonary Rehab a successful program?

a. Teamwork
b. Pulmonologist
c. Respiratory Therapist
d. Exercise Physiologist
“Individual talents get magnified many times over through the collective lens of an effective team.”

Dalal Haldeman
References


From the *Global Strategy for the Diagnosis, Management and Prevention of COPD*, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2016.
References

