

Exercise for Special Populations

Orthopedic and Respiratory Problems

Outline

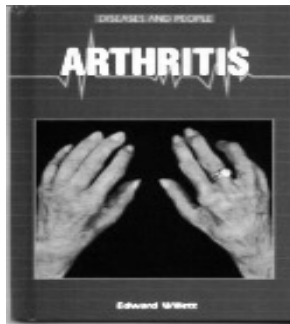
- Exercise and orthopedic problems
- Exercise and respiratory problems
 - COPD
 - Asthma
 - Restrictive Diseases

Benefits of Exercise for Individuals with Special Concerns

- Increased stamina
- Enhanced quality of life
- Increased energy levels
- Decreased risk of diseases such as heart disease & type II diabetes
- Overall wellness

Orthopedic Problems

- Bone and joint disorders
 - Osteoarthritis – degeneration of cartilage, affects millions of Americans, usually over 40
 - Rheumatoid arthritis – inflammatory arthritis, more common in younger (20's, 30's) women, wt control and exercise are important components of treatment
 - Joint injuries
- Use large muscle groups distant from injury
- Avoid weight-bearing exercises at the affected area



Respiratory Problems

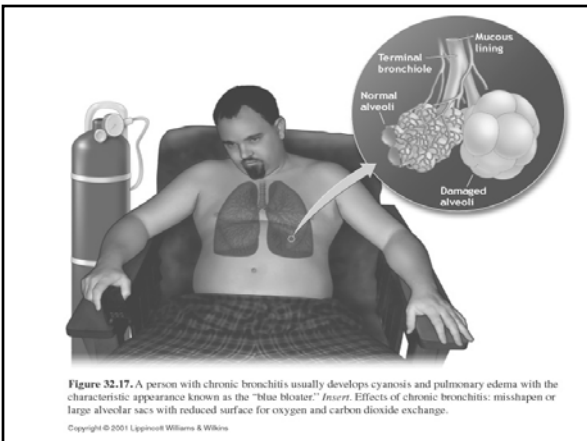
- Subtypes of respiratory disease
 - Obstructive
 - Restrictive
 - Mixed
 - Pulmonary Vascular Hypertension

Respiratory Diseases - Pathology

- Ventilatory Impairments
 - Increased airway resistance
 - Reduced compliance
 - Increased work of breathing
 - Ventilatory muscle weakness
 - Ventilatory inefficiency
 - Ventilatory muscle fatigue
 - Ventilatory failure

Obstructive Diseases

- Result of narrowing of the airways leading to uneven distribution of ventilation
- Chronic Bronchitis, Emphysema, Asthma
- “Blue Bloater”



Exercise and Respiratory Problems - COPD

- COPD – Chronic Obstructive Pulmonary Disease
 - Usually a combination of emphysema (a destruction of lung tissue) and chronic bronchitis (chronic inflammation of the airways)
 - Extremely common among long-time smokers
 - Leads to an inability to “catch your breath” – a sensation of breathlessness
 - Limits exercise due to inability to get oxygen into the blood
 - Exercise (e.g., walking) can be used in the treatment of COPD, for example to improve endurance of the respiratory muscles

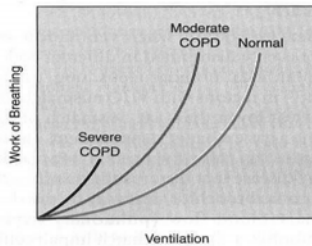


Figure 37.7. Work of respiratory muscles increases as ventilation increases. In moderate COPD the work of breathing is greater than normal at any given level of ventilation. In severe COPD with the onset of respiratory muscle fatigue, work of breathing is further increased; in addition, the maximum work that can be generated by respiratory muscle is diminished.

Exercise and Respiratory Problems - Asthma

- Asthma
 - A condition that reduces the size of the airways leading to the lungs (“bronchoconstriction”)
 - Generally, all exercise and sports activities are OK, with caution and planning
 - Approximately **17.6 million** adults (18 and over) were told that they had asthma (CDC, 1997)
 - More **females (10.1 million)** than **males (7.4 million)** have asthma
 - More people in the **South** have had Asthma than in any other region (CDC, 1997)

Exercise and Respiratory Problems - Asthma

- Safety concerns with exercise

- Have asthma medication readily available (inhaler)
- May need to avoid cold, dry air as that aggravates asthma in some people
- Avoid air pollution

Restrictive Diseases

- Restriction of lung volume by disease involving the thorax or the lung parenchyma
- Diseases of the rib cage and spine – scoliosis, spinal cord injury, pleuritis, obesity
- Involves inflammation of the interstitial and alveolar tissue w/ accompanying fibrosis
- “Pink Puffer”

“Pink Puffer”

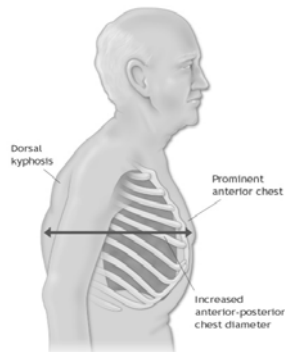


Figure 22.19. Empty space traps air in the lungs, making exhalation difficult. With time, changes occur in the physical features of the patient, hence the name “pink puffer.”
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Summary

- Orthopedic problems mandate special consideration when prescribing exercise.
- Several different types of respiratory diseases exist.
- Exercise is beneficial in those with respiratory diseases in that it improves respiratory muscle and skeletal muscle function (extremities).
- Asthmatics who can control asthma medically can safely participate in exercise.
