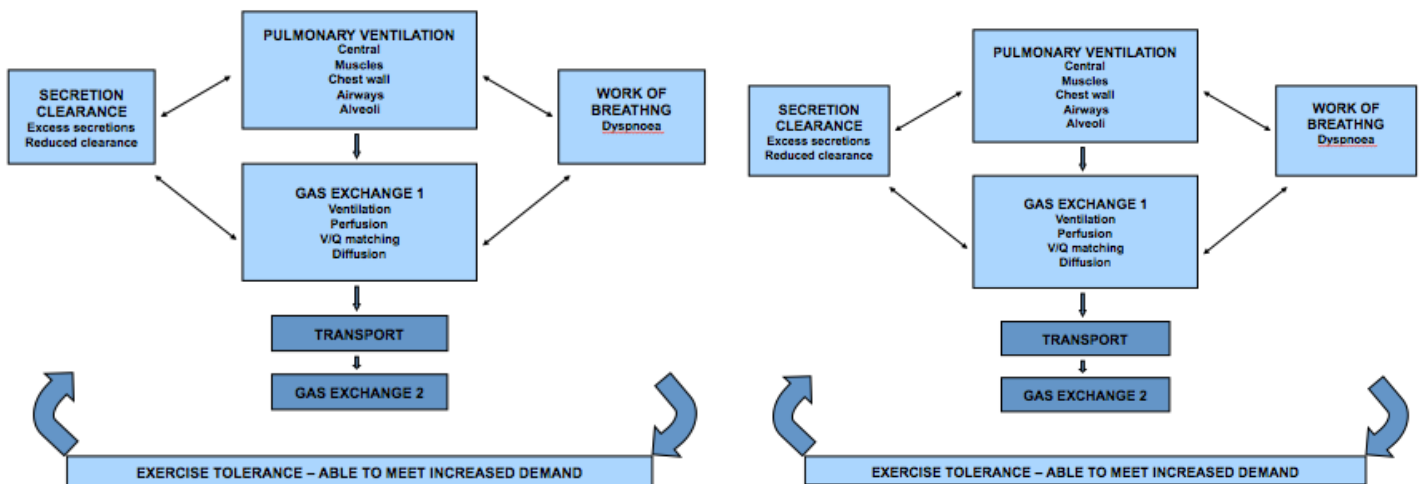


Learning Objectives:

1. Consolidate information gained in CP sections of PHTY1010 and PHTY1020.
1. Understand the role and scope of cardiopulmonary physiotherapy in the health care setting.
2. Understand the planned structure of PHTY2040 and PHTY3020
3. Understand the concept of cardiopulmonary dysfunction and where dysfunction may occur in the CP system.
4. Relate CP dysfunction to identifying respiratory problems amenable to physiotherapy.
5. Differentiate between a cause, a sign/symptom, an effect and a problem.
6. Understand the process of determining respiratory problems
7. Identify commonly encountered respiratory problems amenable to physiotherapy treatment
8. Discuss the impact of CP problems on the patient in terms of activity limitations and participation restrictions.
9. Discuss issues related to measurement of the function of the cardiopulmonary system.



Processes of respiration in summary
 Pulmonary ventilation (alveolar ventilation) → air in and out of the alveoli
Gas exchange 1: gas from alveoli → capillary
 Transport (blood): gas → body
Gas exchange 2: gas from capillary → tissue

Functions of the respiratory system

Pulmonary ventilation

- Central control = medulla
- Respiratory pump = muscles, bones e.g. thoracic trauma, neuromuscular disease
- Airways e.g. obstruction, flow limitation
- Alveoli e.g. reduced lung volumes, alveoli filled with something, pneumonia

Gas exchange 1

- Ventilation
- Perfusion
- Matching of ventilation and perfusion (V/Q)
- Diffusion

Transport (blood)

- Hb, cardiac output e.g. heart failure, anaemia

Gas exchange 2

- Tissue characteristic & capillaries

Other problems: Secretion clearance // reduced exercise tolerance // thoracic pain // increased work for breathing

Signs and Symptoms of respiratory dysfunction

- Shortness of breath
- Cough sputum
- Reduced exercise tolerance (SOB)
- Wheeze

Pathophysiological consequences

⇒ E.g. respiratory failure, mechanical ventilation, organ failure, death

Consequences for activity and participation

⇒ Limitations and restrictions (disability and handicap)
⇒ E.g. unable to work, unable to attend school

ICF Activities and Participation

1. Learning & Applying Knowledge
2. General Tasks and Demands
3. Communication
4. Movement
5. Self Care
6. Domestic Life Areas
7. Interpersonal Interactions
8. Major Life Areas
9. Community, Social & Civic Life

Differentiating between cause, problem, signs and symptoms and consequences (effects)

Cause

- The pathophysiological background

Respiratory problems

- Ventilation, secretion clearance, other (ex tol, WOB)

Signs and Symptoms

- SOB, cough, sputum, chest pain, wheeze

Effects

- Pathophysiological
- On activity and participation i.e. overall functioning

Other functions of the lungs

Lung defense:

- Upper airway
- Cough
- Mucociliary clearance

Activity/Exercise:

- Increased demand of oxygen
- Needs to meet these demands

Respiratory sensations:

- Work of breathing (dyspnoea)
- Pain

Other:

Metabolism and detox

Activates – angiotensin I to angiotensin II (ACE, vasoconstrictor)

Deactivates – serotonin, prostaglandins

These can all go wrong → dysfunction

Example

50 year old man, Wife and 3 children, works as a high school teacher. Presents with ↑ SOB, cough with green sputum++. On medical examination – febrile 38.5°C, RR 35, HR 110, moist productive cough, ↓ arterial oxygen levels, Right lower lobe alveolar consolidation on CXR. Diagnosed with community acquired (R)LL pneumonia (lung parenchyma infection).

Main respiratory problems amenable to physiotherapy

- Secretion clearance
- Reduced alveolar ventilation (regional to the (R)LL)

Cause

- Pneumonia, alveoli infected, inflamed and filled with exudate, unable to get air into the alveoli and therefore unable to exchange gas, secretions in airways also increase the resistance to airflow making it harder to breath (SOB)

Signs and symptoms

- Dyspnoea, increase temperature, increase HR, increase RR, low oxygen, moist cough, CXR findings of consolidation in alveoli

