

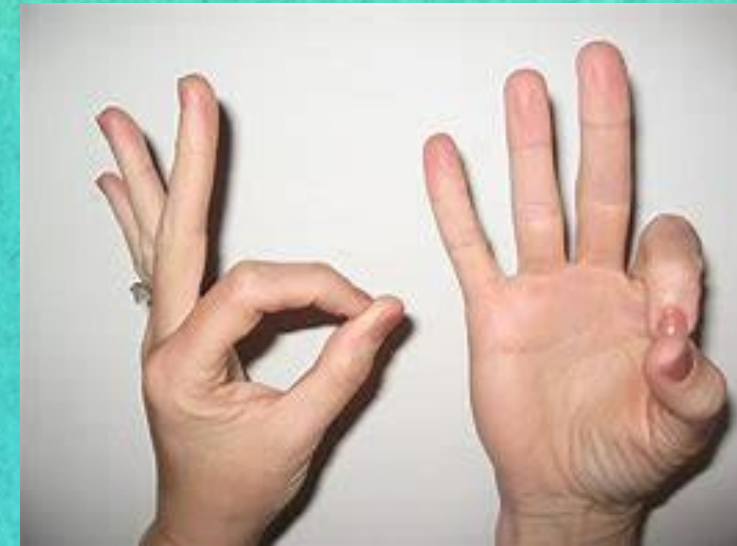
Remedial Physical Education

Remedial PE for people with respiratory disorders

Department of Adapted PE
and Sports Medicine 2020



Obr. 12 Smíšený typ ventilační poruchy – pacientka s CHOPN (obstrukce) a kyfoskoliózou (restrikce)



Why is breathing important for us?

Importance of breath:

metabolic (transport of gases)

mechanical (pressure changes have influence on blood flow and peristaltic pump)

formative (influence on locomotor system, posture)

regulatory (changes of muscle tension)



What is important for our breathing?

- Position of the whole body, position of arms
- Chest and its flexibility (spine, ribs, soft tissues)
- Nervous system, psychological factors
- Season (spring allergies, cold air etc.)
- Environment (altitude, pollution, etc.)
- Exercise load

Respiratory disorders

- High incidence in population, high seasonal incidence
- Most of these people have difficulties while exercising – dyspnea, short of breath, lower fitness, fatigue
- Important for exercise is cooperation with medical doctor

Work of **breathing** is the force generated to overcome the frictional **resistance** and **static** elastic forces that oppose lung expansion and gas flow into and out of the lungs.

a) **STATIC** compliance /lung tissue elasticity, stiffness of chest wall/ - restrictive disorders

b) **DYNAMIC** compliance /air flow in airways, obstacles like inflammation, mucus, bronchoconstriction/ - obstructive disorders

See more at: <https://www.youtube.com/watch?v=wc2K1Olt4Q8> ,

https://www.youtube.com/watch?v=GD-HPx_ZG8I ,

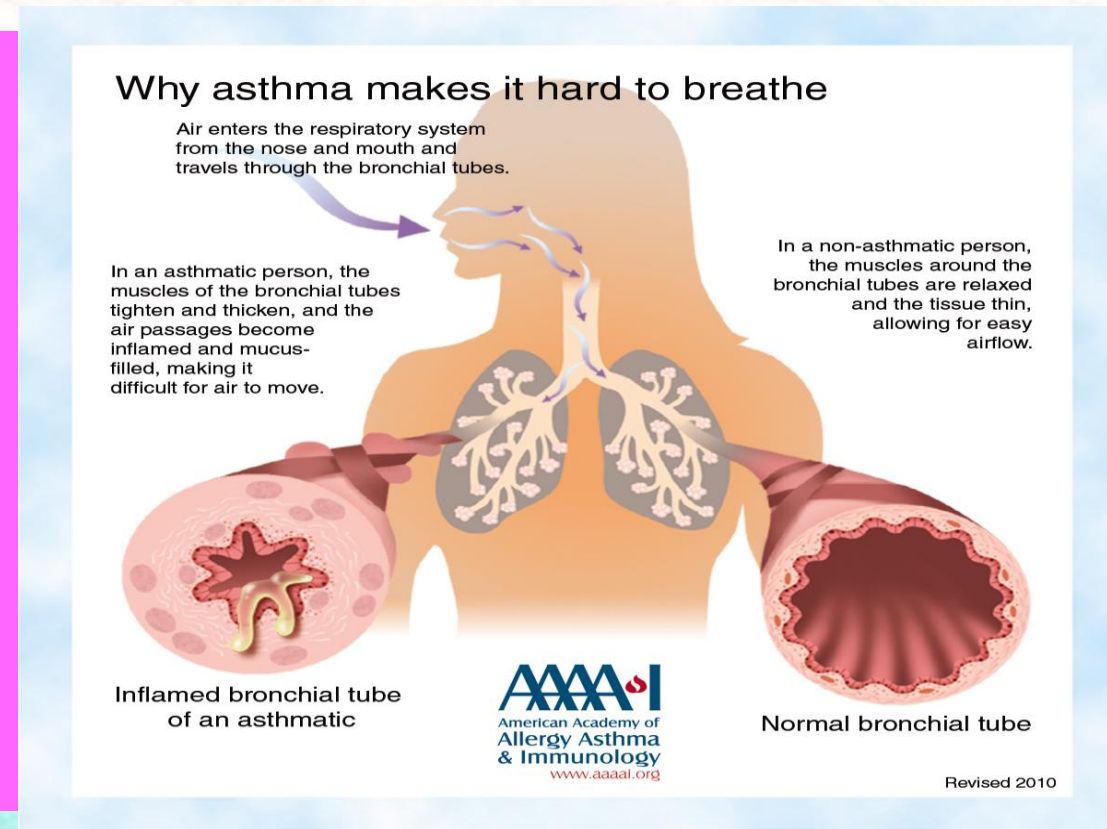
<https://www.youtube.com/watch?v=BTwgmMfqOW4>

Asthma

- One of the most frequent disorder in kids, in EU up to 25% of population
- 1/2 diagnosed before age of 5
- Chronic condition with seizures of dyspnea, esp. while breathing out
- Airway obstruction (bronchospasm, swelling, mucus hypersecretion)
- Factors: allergy, physical exercise, stress
- Pathophysiology here: <https://www.youtube.com/watch?v=x-kOqQdgE10>

Asthma signs and symptoms include:

- Shortness of breath
- Chest tightness or pain
- Trouble sleeping caused by shortness of breath, coughing or wheezing
- A whistling or wheezing sound when exhaling (wheezing is a common sign of asthma in children)
- Coughing or wheezing attacks that are worsened by a respiratory virus, such as a cold or the flu



Asthma

Risk of exercise induced bronchospasm (PAST):

- 70 % asthma patients
- esp. while mouth breathing (hyperventilation), dry cold air
- Mostly after athletics (track) and games (less after swimming)
- Mostly after exercise intensity of 70-80 % VO_2max
- In exercise lasting at least 6 min /4-10 min after beginning/ or 5-15 min after exercise interruption

Remedial PE in asthma

PAST risk prevention, non allergy environment, increase of fitness level, posture, relaxation, respiratory muscles training, aquatics, speleotherapy, chest wall and face flexibility, „free nose“, shoulder and neck muscles releasing, learning positions which are favourable + pursued lips breathing, breathing gymnastics

Breathing gymnastics

- Without movement of body parts (breathing only)
- With movements (arms, legs)
- Against resistance
- Local breathing
- Singing
- Flute playing
- With aids (+ pronunciation s, p, t, k...)
- „huffing“



<https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/patient-resources-and-videos/pursed-lip-breathing-video.html>

Inspiration for exercise for people with asthma

- <https://www.healthline.com/health/asthma/exercise-for-asthma>
- <https://www.asthma.org.uk/advice/living-with-asthma/exercise-and-activities/>
- <https://www.aaaai.org/conditions-and-treatments/library/asthma-library/exercise-and-asthma>
- <https://www.mayoclinic.org/diseases-conditions/exercise-induced-asthma/symptoms-causes/syc-20372300>
- [https://www.exerciseismedicine.org/singapore/assets/page_documents/ESSA Exercise Asthma.pdf](https://www.exerciseismedicine.org/singapore/assets/page_documents/ESSA_Exercise_Asthma.pdf)
- [https://www.fims.org/files/9114/2056/0704/FIMS PS Exercise Induced Asthma Schumacher Dec 2011.pdf](https://www.fims.org/files/9114/2056/0704/FIMS_PS_Exercise_Induced_Asthma_Schumacher_Dec_2011.pdf)

Tasks for distance study

Please go through the **presentation** including the „web links“.

Please read the study material, chapter 4.3. – breathing exercise, pages 43-75 (ideally before the practical lecture on Thursday). Try the exercises described in the study material.

Please answer the following questions:

1. How can we prevent exercise induced bronchospasm?
2. What is the importance of pursed lip breathing?
3. Which position would you recommend for abdominal breathing training?