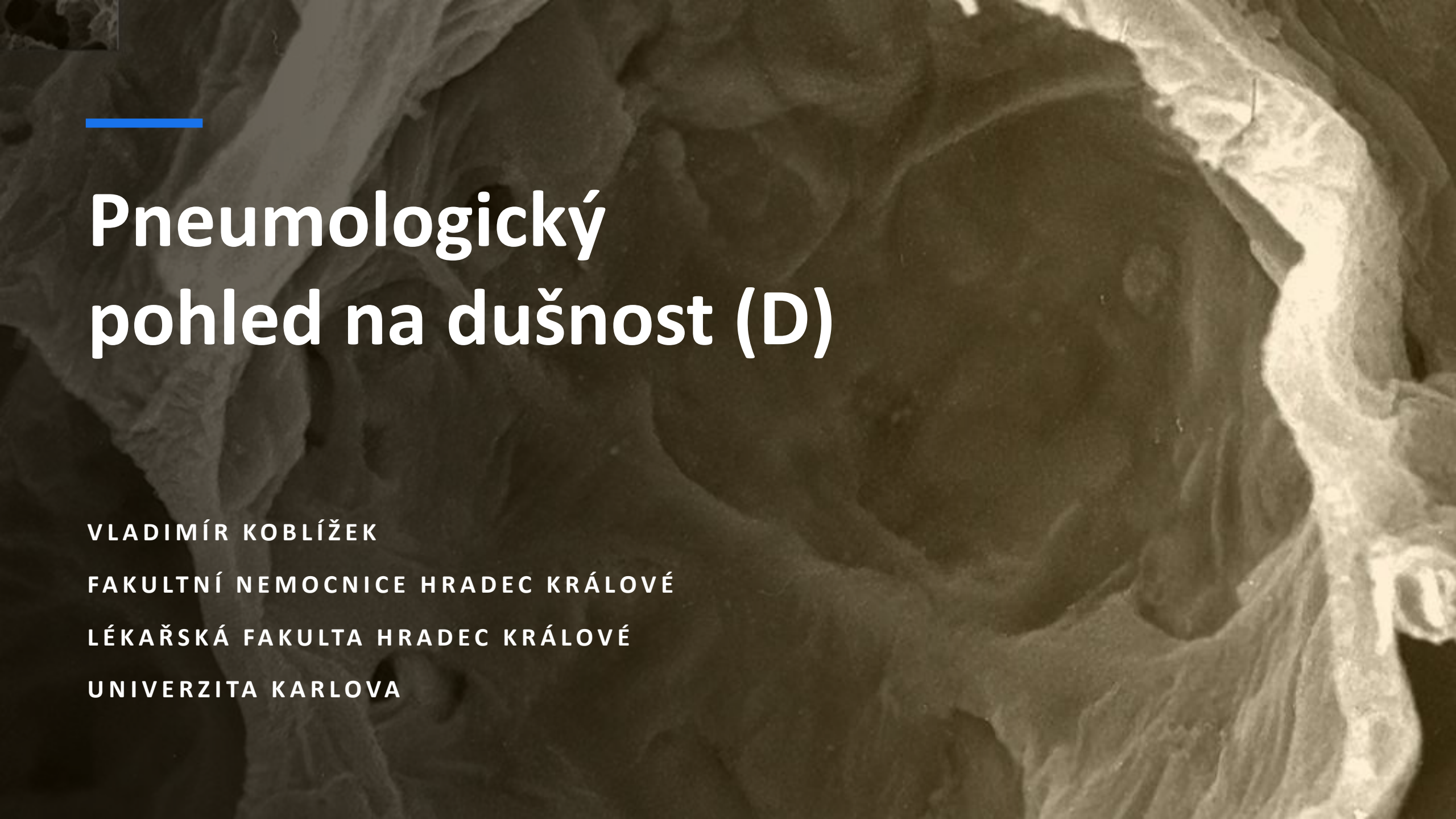


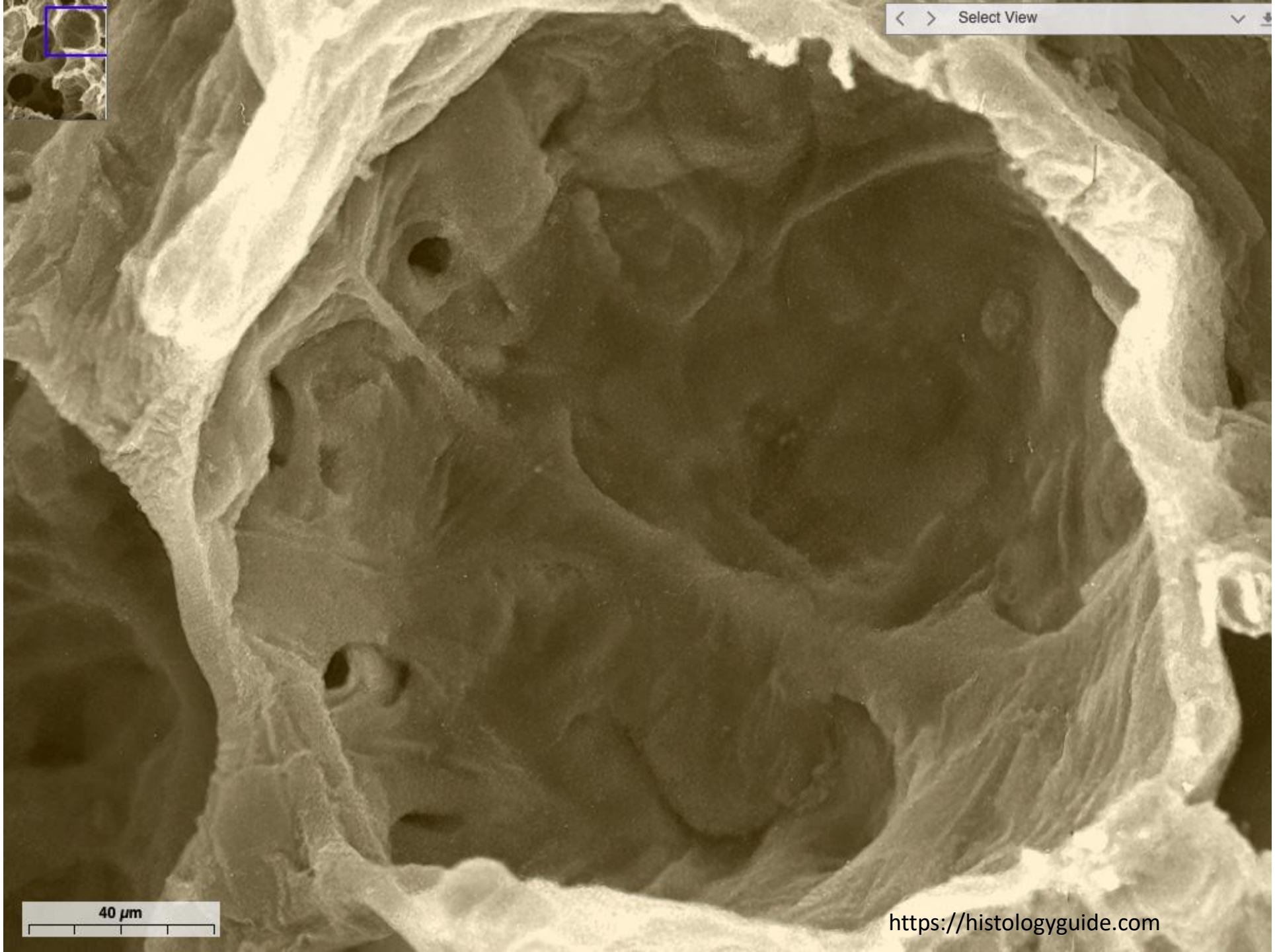
Pneumologický pohled na dušnost (D)

VLADIMÍR KOBLÍŽEK

FAKULTNÍ NEMOCNICE HRADEC KRÁLOVÉ

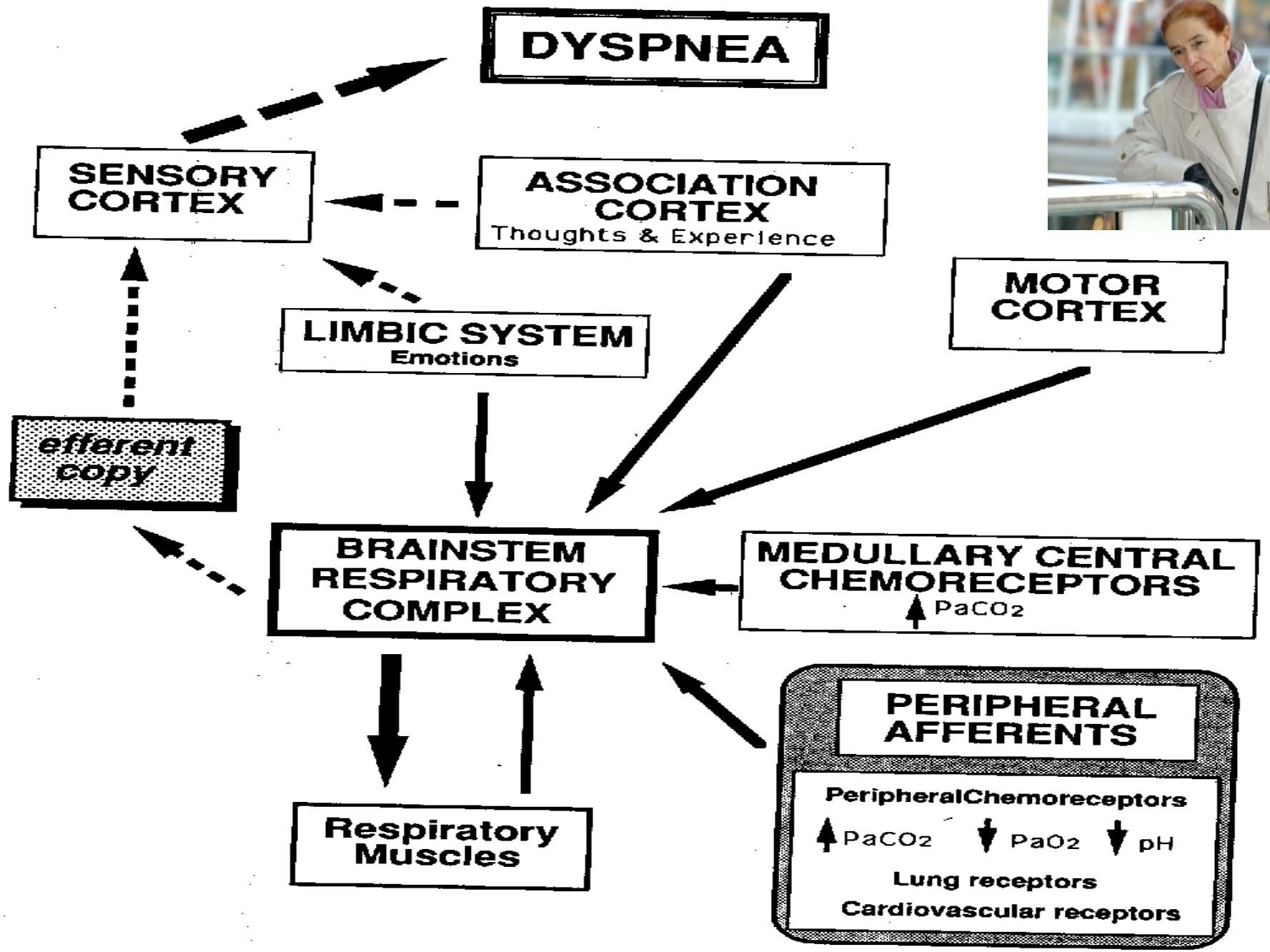
LÉKAŘSKÁ FAKULTA HRADEC KRÁLOVÉ

UNIVERZITA KARLOVA

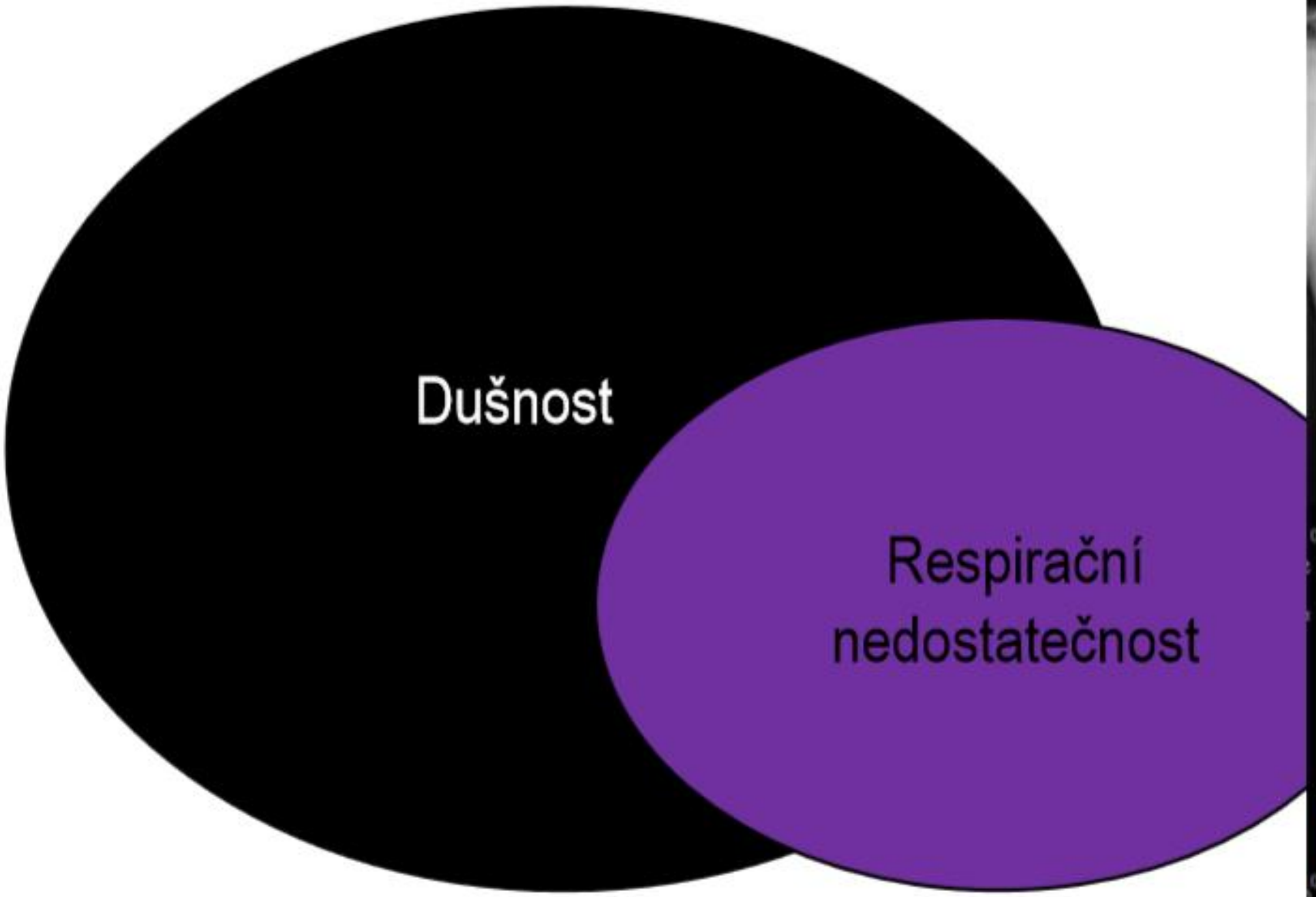


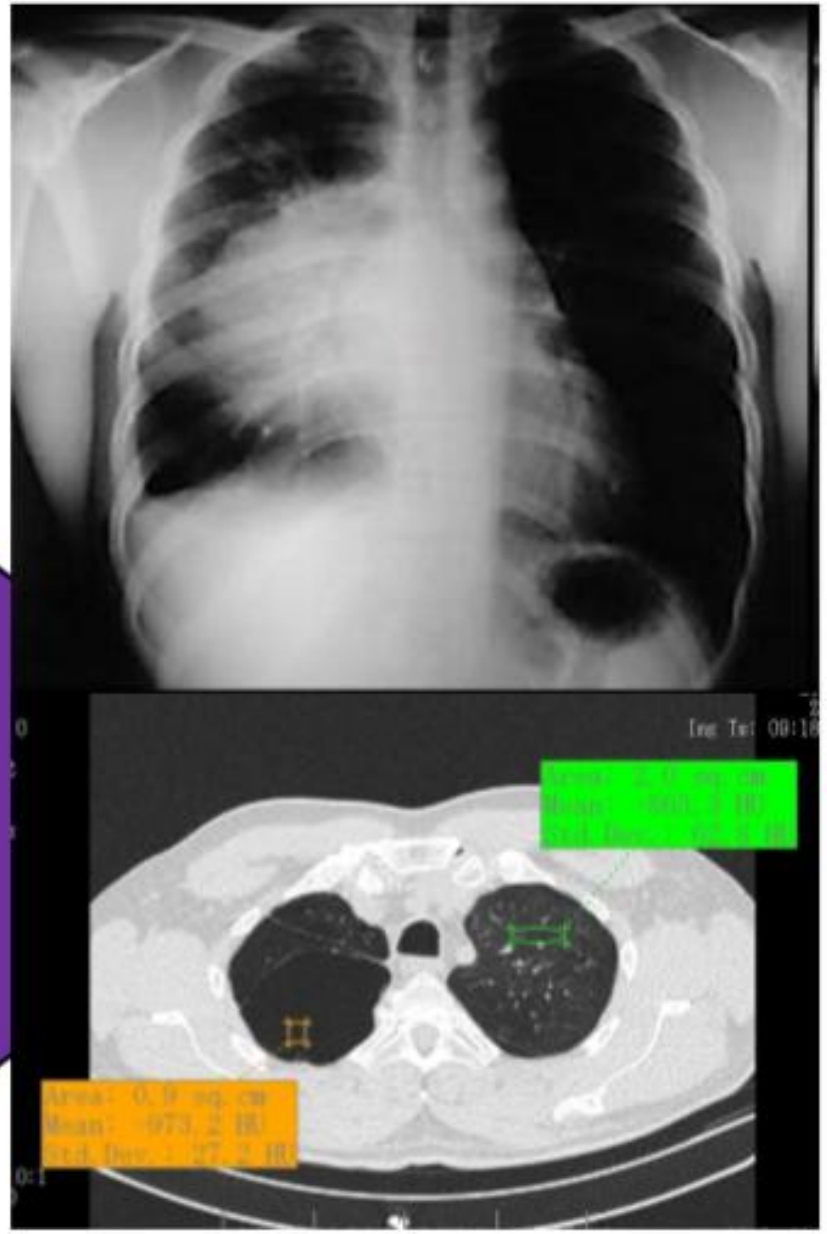
https://histologyguide.com

D = čistě subjektivní parametr

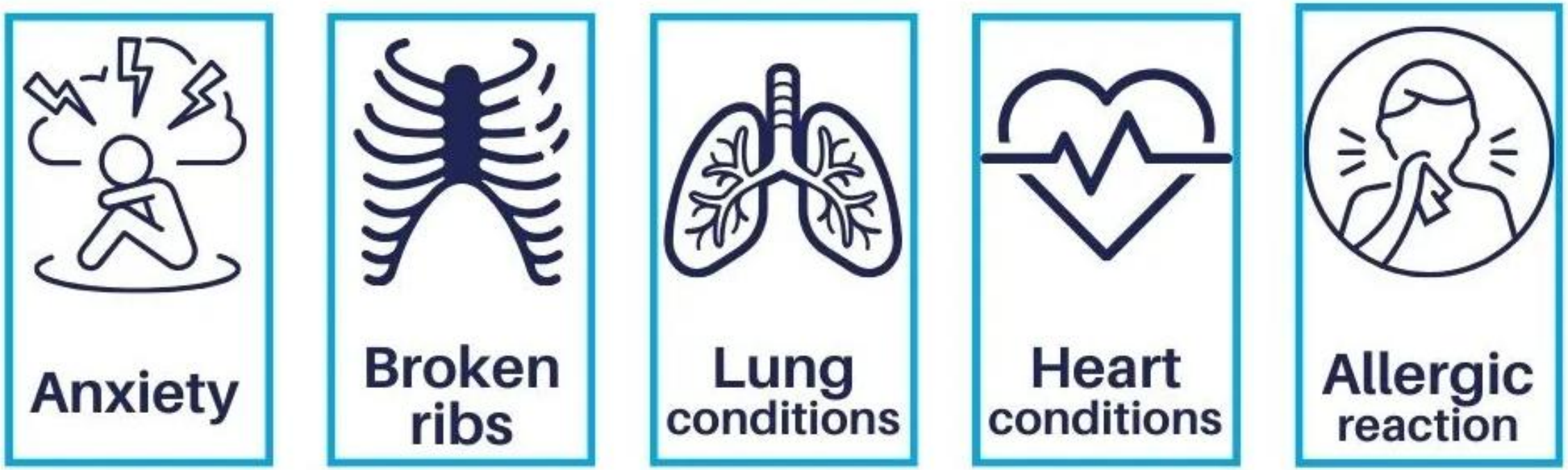


D není respirační selhávání (RF)



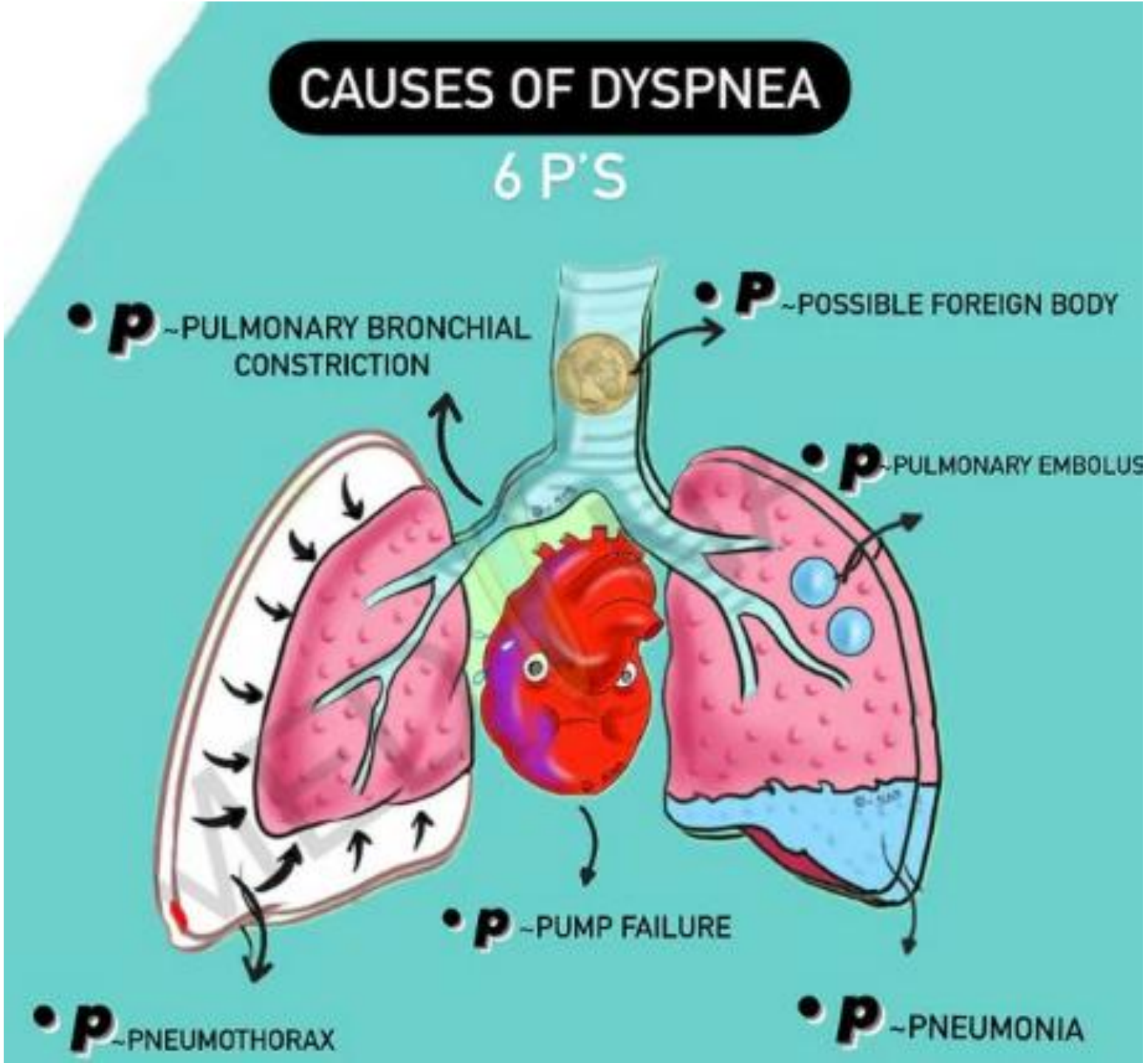


Elementární klasifikace příčin D

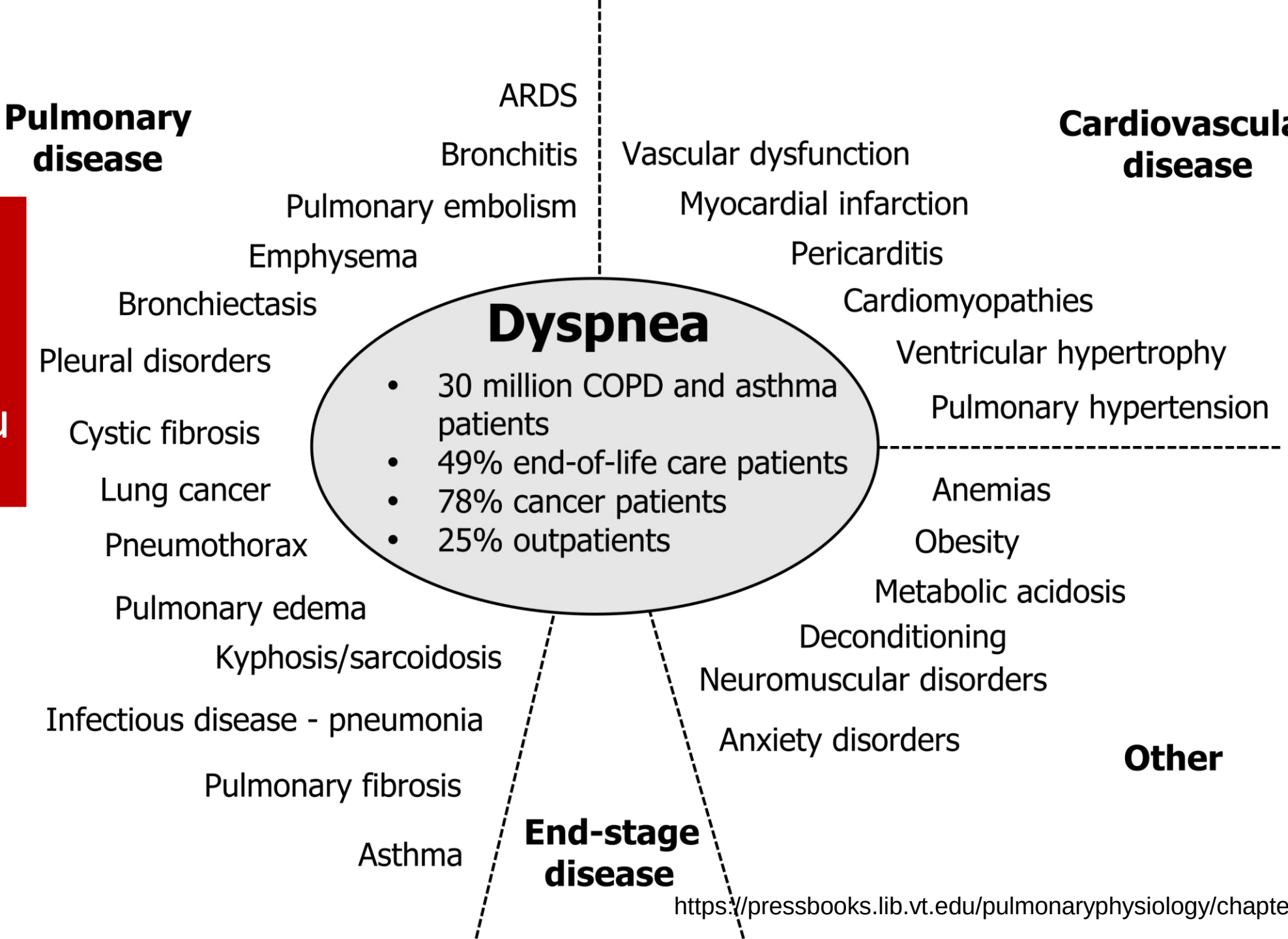


https://www.oxygenconcentratorsupplies.com/articles/what-is-dyspnea

SIMPLIFIAKCE
Příčin D ve spěchu na pohotovosti

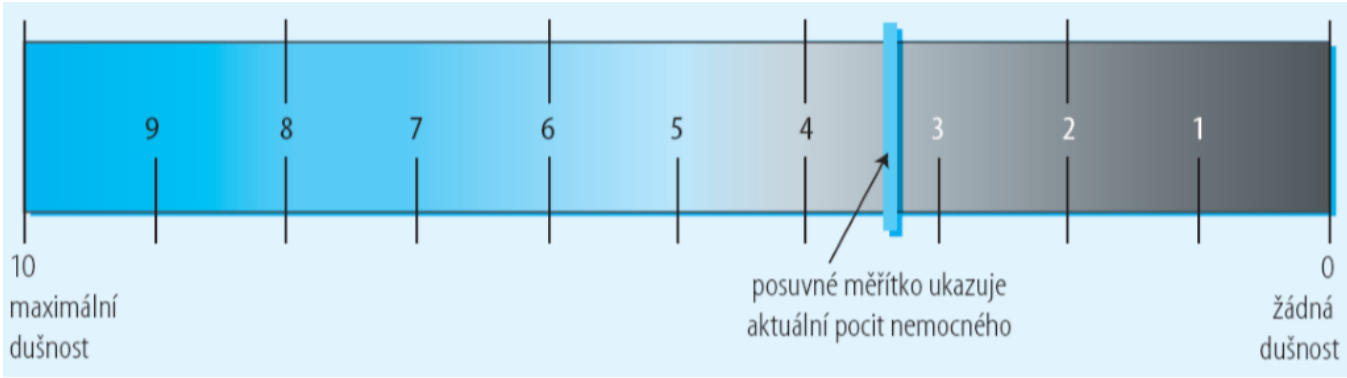


NEZŘÍDKA více příčin D najednou



https://pressbooks.lib.vt.edu/pulmonaryphysiology/chapter/dyspnea/

Numerické posouzení D



MODIFIED MRC DYSPNEA SCALE[a]

PLEASE TICK IN THE BOX THAT APPLIES TO YOU | ONE BOX ONLY | Grades 0 - 4

mMRC Grade 0.	I only get breathless with strenuous exercise.	☐
mMRC Grade 1.	I get short of breath when hurrying on the level or walking up a slight hill.	☐
mMRC Grade 2.	I walk slower than people of the same age on the level because of breathlessness, or I have to stop for breath when walking on my own pace on the level.	☐
mMRC Grade 3.	I stop for breath after walking about 100 meters or after a few minutes on the level.	☐
mMRC Grade 4.	I am too breathless to leave the house or I am breathless when dressing or undressing.	☐

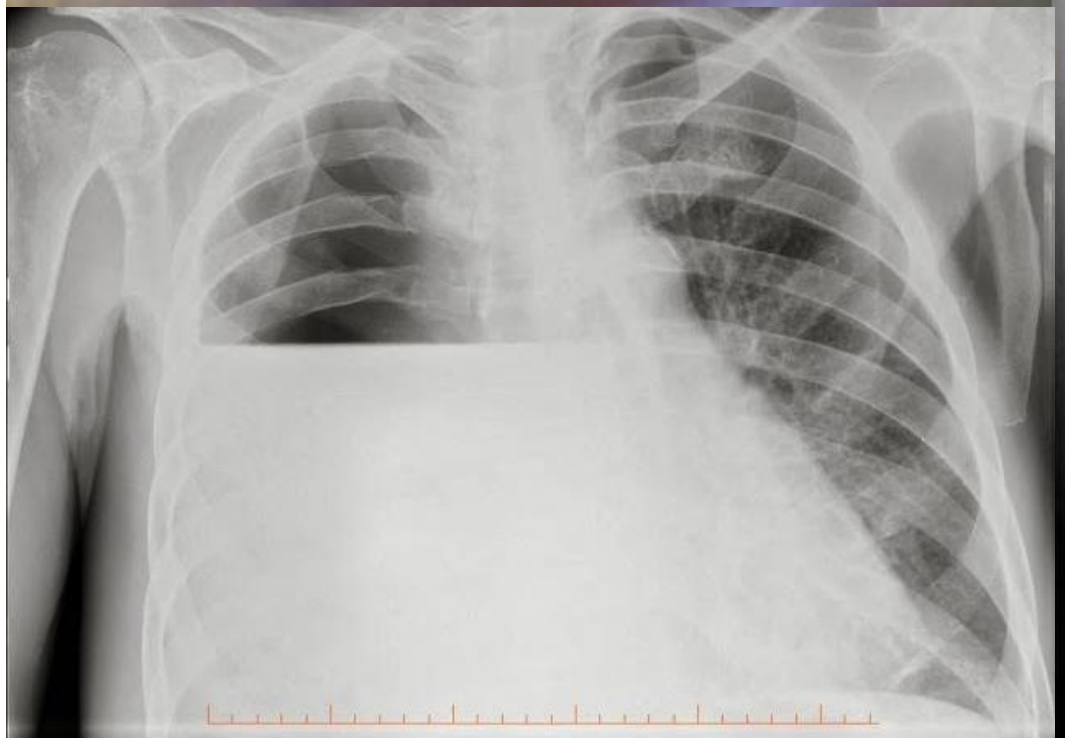
[a] Fletcher CM. BMJ 1960; 2: 1662.

NYHA Classification

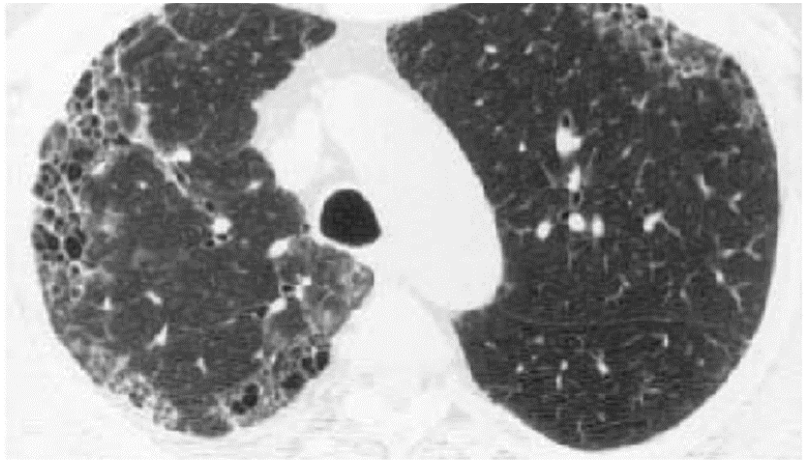
Class I	Ordinary physical activity does not cause undue fatigue, palpitations, dyspnea and/or angina
Class II	Ordinary physical activity does cause undue fatigue, palpitations, dyspnea and/or angina
Class III	Less than ordinary physical activity causes undue fatigue, palpitations, dyspnea and/or angina
Class IV	Fatigue, palpitations, dyspnea and/or angina occur at rest

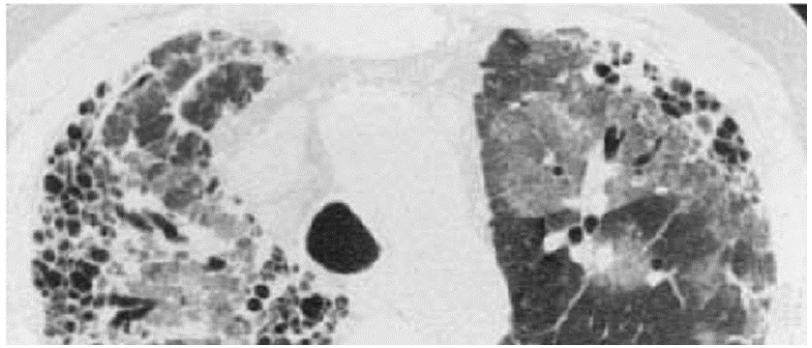
Criteria Committee of the New York Heart Association, 1964.

Klinicky jasné situace

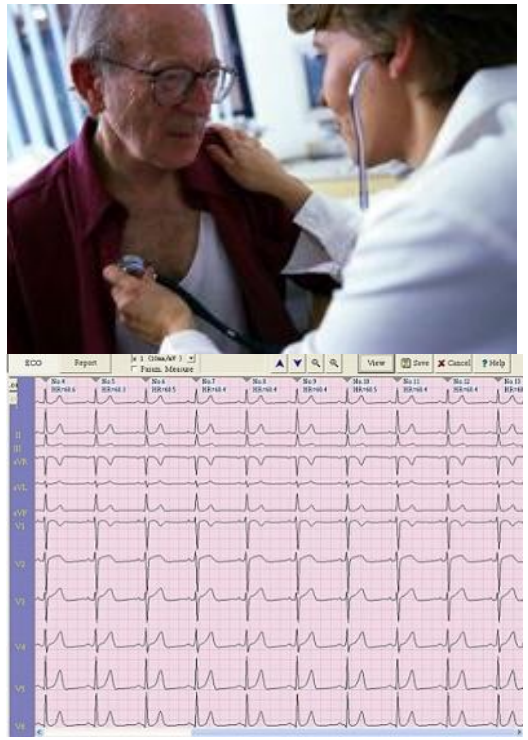


Klinicky méně jasné situace





U méně jasných stavů raději širší paleta testů



Diagnostic evaluation of dyspnea in ED

Clinical evaluation

- **Respiratory rate**
- **Signs of *respiratory distress***
  - tachypnea
  - hyperpnea
  - rapid shallow breathing
  - activation of accessory muscles
- **Signs of *increased work of breathing***
  - recession of suprasternal fossa
  - tracheal tug
  - Hoover sign
  - sternomastoid activation
  - occipital dorsiflexion
  - nasal flaring
  - mouth opening
  - inspiratory laryngeal groans

Blood biomarkers

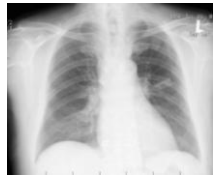
- **Arterial blood gas analysis**
  - pH, PaO_2, and $PaCO_2$, HCO^{3-}
- **BNP/pro-BNP**
- **hs-cTn** (with a 12-lead ECG)
- **D-dimer**

Imaging

- **Ultrasound**
  - heart
  - Lung/diaphragm
- **Chest X-ray**
- **Chest CT** (with/without contrast medium)

Zobrazení RTG

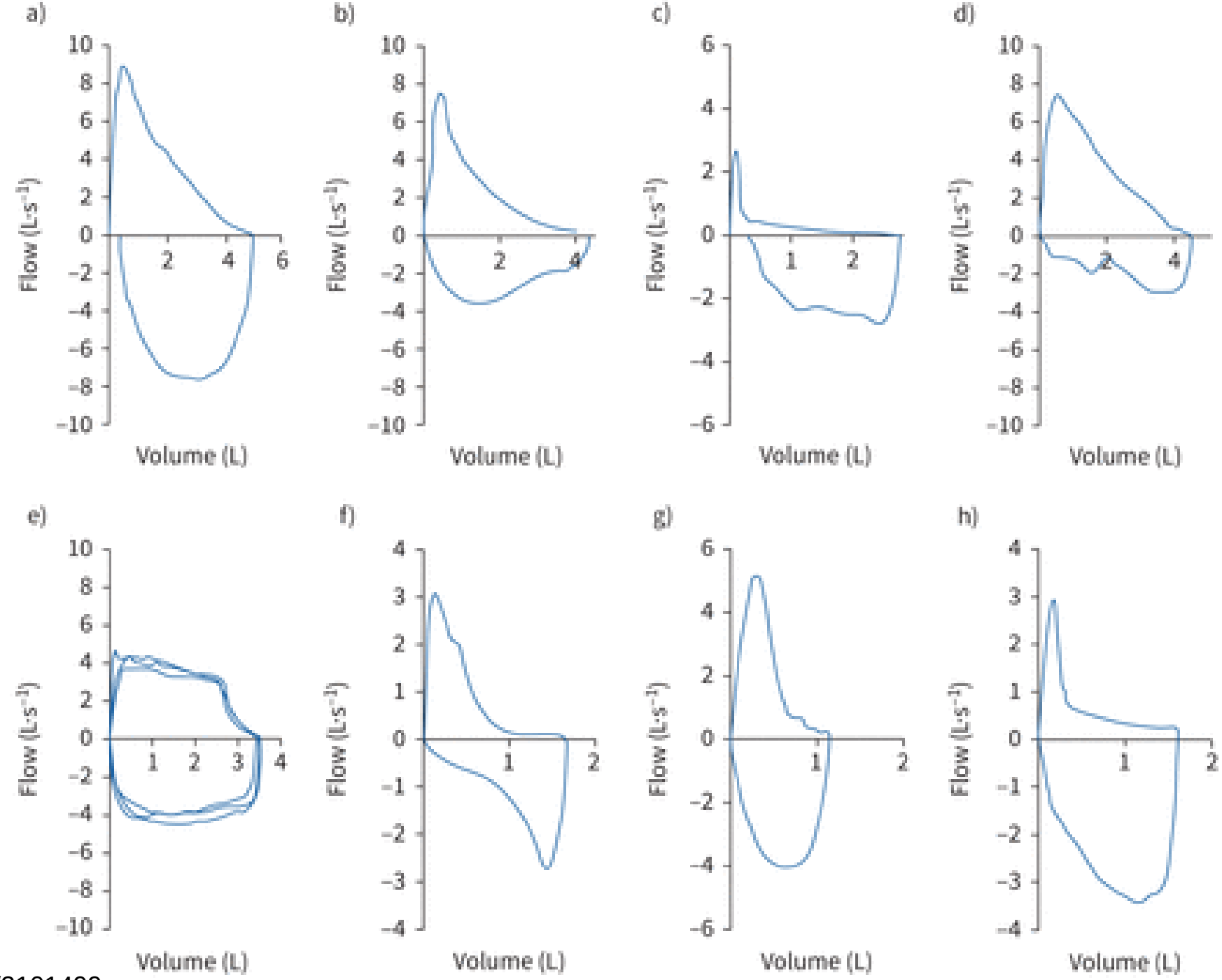
Norma



Bronchiální obstrukce
IPP
PCP
PE
NMD
Anémie

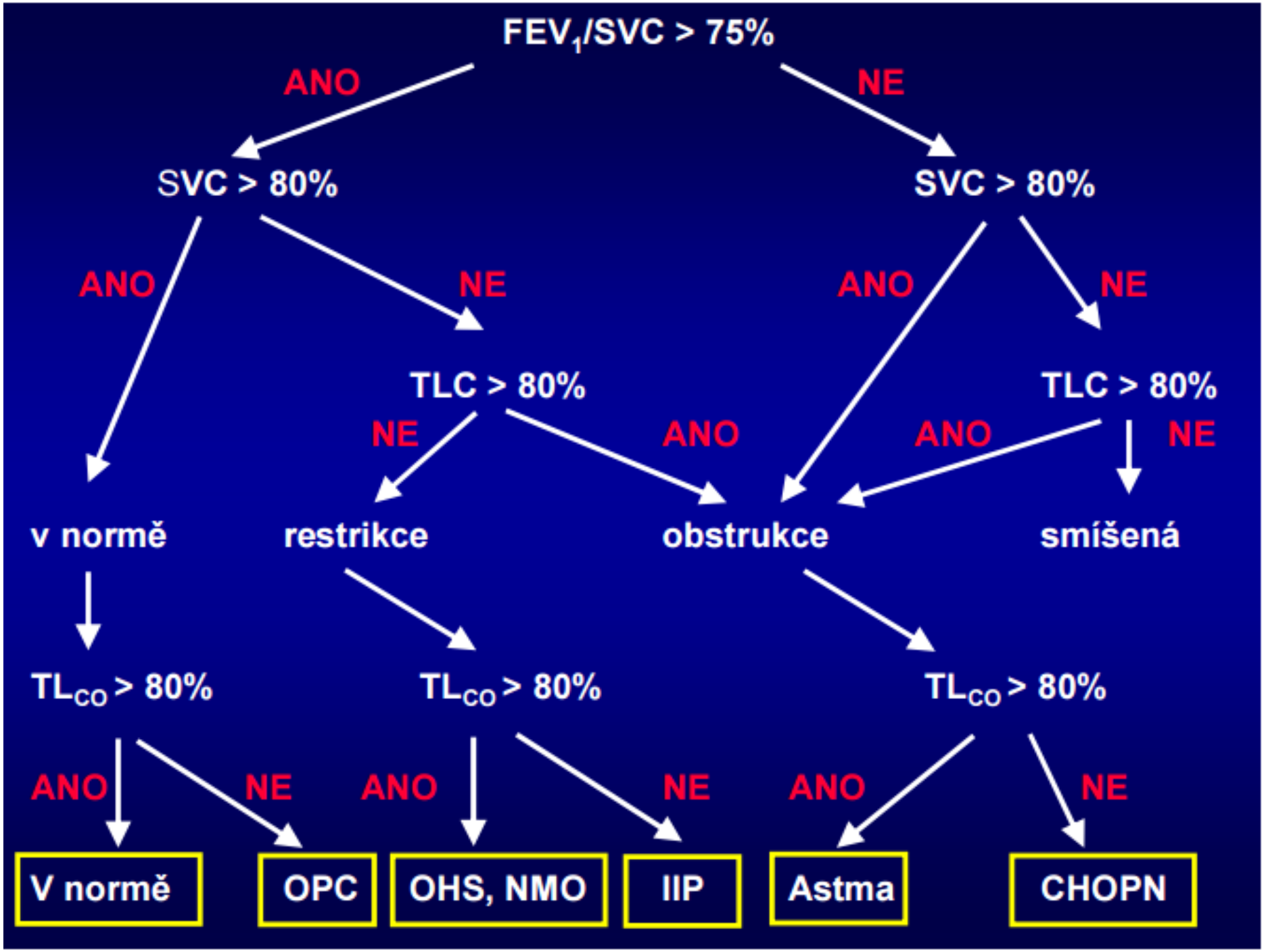
Spirometrie
PFTs
HRCT
V/Q
CTA
NEUR./Síla s.

Spirometrie

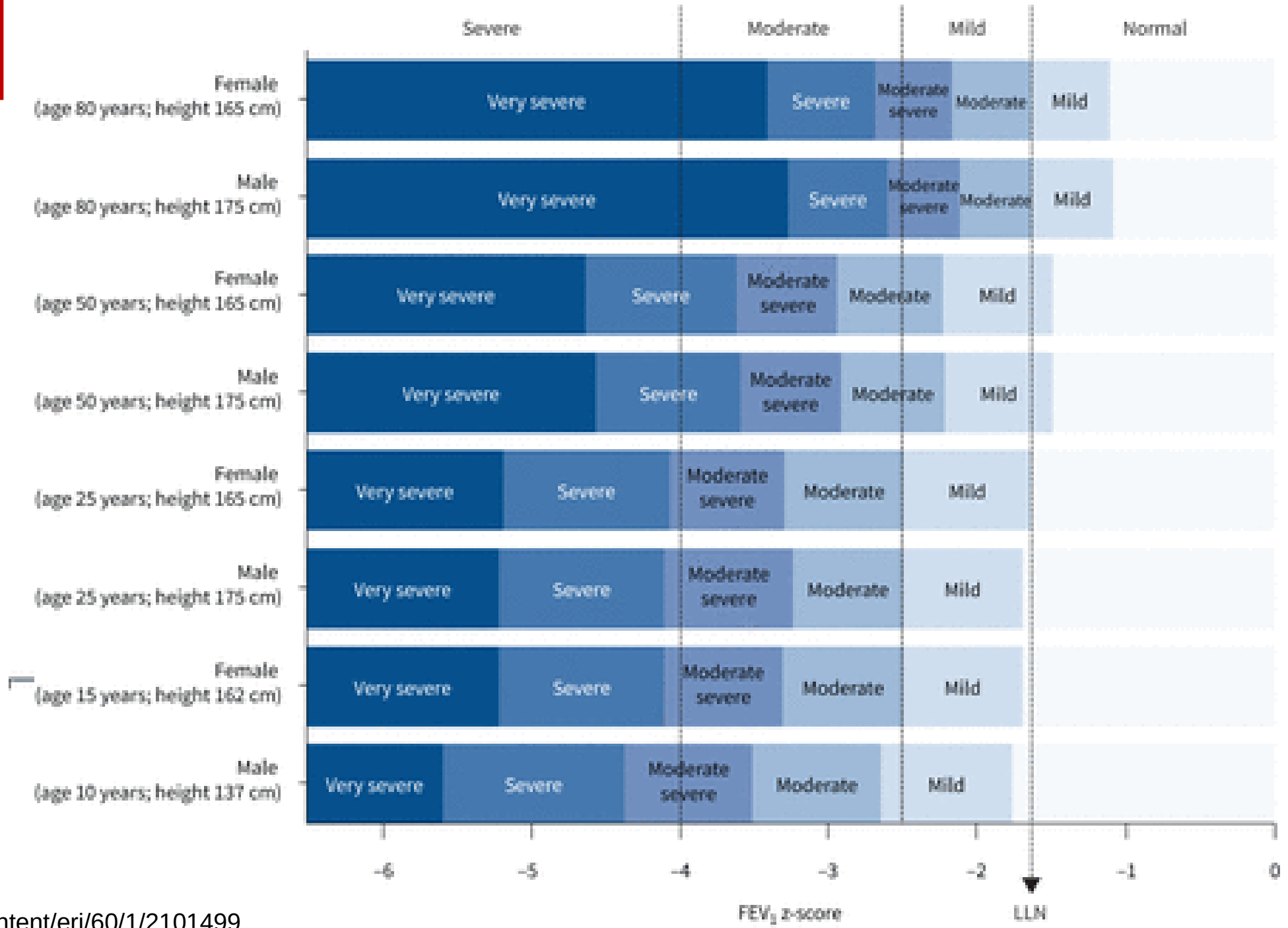


https://publications.ersnet.org/content/erj/60/1/2101499

Funkční testy



Z-skóre



https://publications.ersnet.org/content/erj/60/1/2101499

A-a diference

A-a O_2 Gradient ☆

Assesses for degree of shunting and V/Q mismatch.

When to Use ⌄ | Why Use ⌄

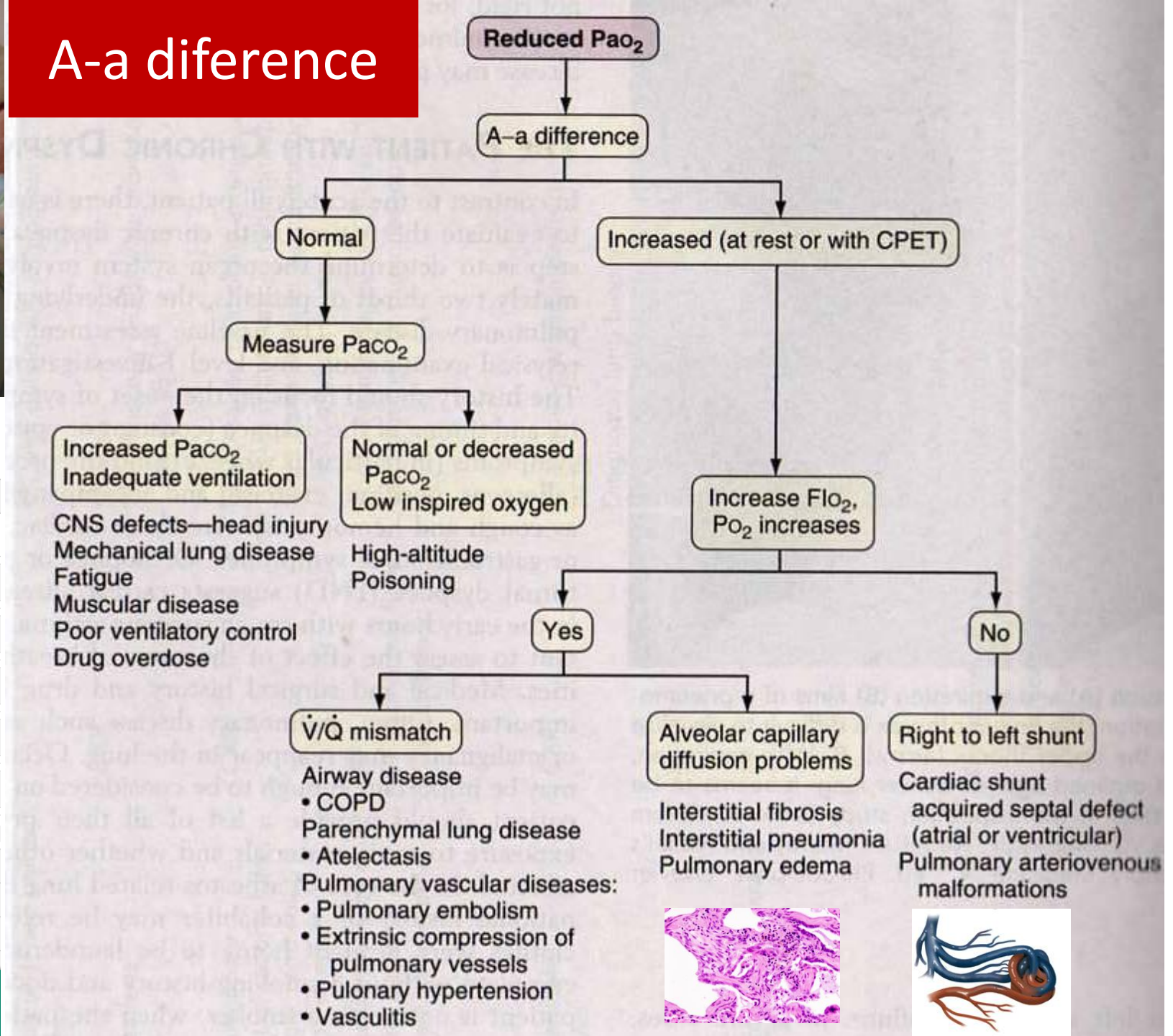
Atmospheric pressure Use 760 mm Hg (101.33 kPa) at sea level	99	kPa ⇆
PaO_2	9.0	kPa ⇆
FiO_2 Use 21% for room air	26	%
$PaCO_2$	4.6	kPa ⇆
Age (for expected A-a gradient)	85	years

Is this a COVID-19 patient?
For research purposes only; answer does NOT impact results.

Confirmed positive
Suspected
Unlikely
Confirmed negative

9.4 kPa
A-a Gradient

3.4 kPa
Expected A-a Gradient for Age



CPET

- Vo_2 max
  - Normal (>80% predicted)
    - Anxiety
    - Obesity (Vo_2 max/kg is low)
    - Mild disease
  - Low (<80% predicted)
    - Maximal heart rate achieved
      - >85% predicted
        - Breathing reserve
          - Normal >15%
            - Deconditioning
            - Obesity
            - Valvular disease
            - Early mild congestive cardiac failure (CCF)
            - Pulmonary vascular disease
            - Anemia
          - Low <15%
            - Early mild lung disease
            - Combined cardiorespiratory disease
            - Mitochondrial myopathy
      - <85% predicted
        - Breathing reserve
          - Normal >15%
            - Moderate/severe CHF
            - Poor effort
            - Coronary artery disease
            - Peripheral vascular disease
            - Early COPD
            - Neuromuscular disease
          - Low <15%
            - Respiratory disease including COPD and interstitial lung disease
            - Neuromuscular disease with predominant respiratory component

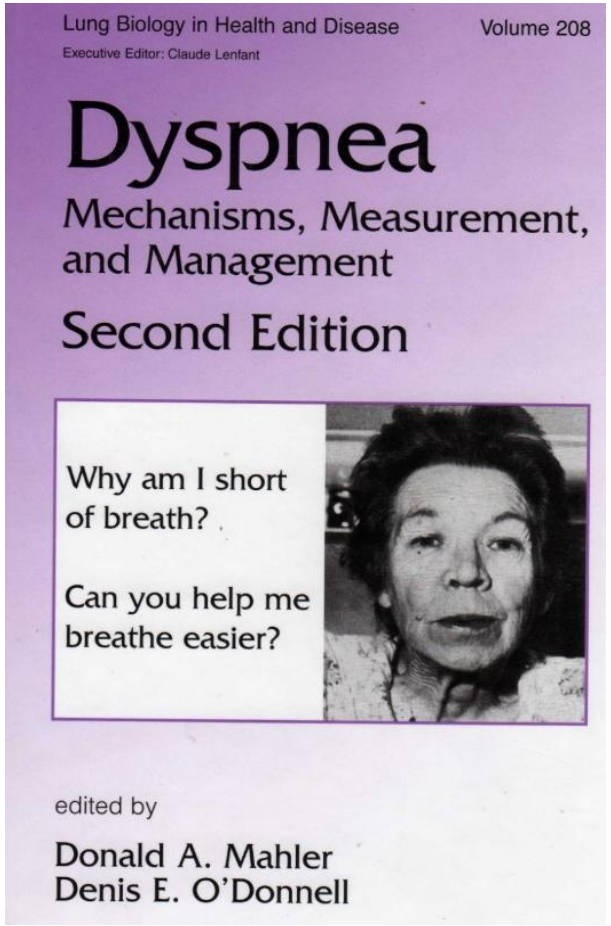
Závěr

Dušnost ryze **subjektivní** pocit

Emoční náboj, modifikace zkušeností

Měřitelná (obtížně)

Mnohočetné příčiny (v reálném životě)

Akutní a chronická, symptomatická

a kauzální **terapie**