

# Chronic bronchitis

Clinic of Pneumology

# Chronic bronchitis - definition

- Chronic bronchitis is bronchitis that lasts longer than 3 months at 2 consecutive years - cough and expectoration
- Chronic bronchitis often occurs with emphysema, and together these diseases are called chronic obstructive pulmonary disease (COPD).

# Symptoms

Bronchitis is an inflammation (or irritation) of the airways in the lungs. When the airways are irritated, thick mucus forms in them. The mucus plugs up the airways and makes it hard for air to get into your lungs

- Symptoms of bronchitis include a cough that produces mucus (sometimes called sputum), trouble breathing and a feeling of tightness in your chest.

# What causes chronic bronchitis?

- Cigarette smoking is the main cause of chronic bronchitis. When tobacco smoke is inhaled into the lungs, it irritates the airways and they produce mucus.
- People who have been exposed for a long time to other things that irritate their lungs, such as chemical fumes, dust and other substances, can also develop chronic bronchitis.





# Look into the bronchus

Podslizniční hlenové žlázy



# Treatment

- If you smoke, the most important thing you can do is to stop. The more smoke you breathe in, the more it damages your lungs.
- If you stop smoking, you'll breathe better, you won't cough as much and your lungs will begin to heal.
- You'll also reduce your chance of getting lung cancer.
- Doctor can help you stop smoking.

# Treatment

- Try to avoid other things that can irritate your lungs, such as aerosol products like hairspray, spray deodorant.
- Also avoid breathing in dust or chemical fumes.
- To protect your lungs, wear a mask over your nose and mouth if you are using paint, paint remover, or anything else with strong fumes.

# Treatment with antibiotics

**In general, antibiotics cannot help chronic bronchitis.**

**Antibiotics may be needed if patient get a lung infection along with your chronic bronchitis.**

- **If patient has a lung infection, patient may cough up more mucus. This mucus might be yellow or dark green.**
- **Other symptoms are: fever and shortness of breath**

**Because chronic bronchitis increases risk of lung infections, it is recommended to get a flu shot every year.**

# **Bronchiectasis**

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# Definition

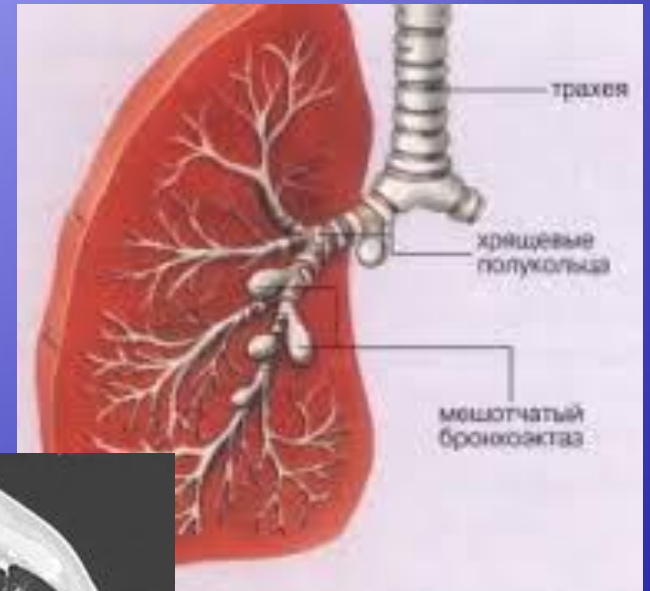
- Bronchiectasis is a disease that causes localized, irreversible dilation of part of the bronchial tree.



# Types of bronchiectasis

- There are three types of bronchiectasis, varying by level of severity.
- Fusiform (cylindrical) bronchiectasis (the most common type) refers to mildly inflamed bronchi that fail to taper distally.
- In varicose bronchiectasis, the bronchial walls appear beaded, because areas of dilation are mixed with areas of constriction.
- Saccular (cystic) bronchiectasis is characterized by severe and irreversible ballooning of the bronchi peripherally, with or without air-fluid levels.

# Bronchiectasis



# Symptoms

- **Chronic productive cough** is prominent, occurring in up to 90% of patients with bronchiectasis.
- **Sputum is produced on a daily basis** in 76% of patients.

# Pathogens

- Generally, persons suffering from bronchiectasis tend to be infected by *Haemophilus influenzae* early on in the disease course.
- Secondary infection is usually due to *Staphylococcus aureus*; followed by *Moraxella catarrhalis* and finally *Pseudomonas aeruginosa*.

# Origin of bronchiectasis

- There are both congenital and acquired causes of bronchiectasis.
- Kartagener syndrome, which affects the mobility of cilia in the lungs, aids in the development of the disease.
- Another common genetic cause is cystic fibrosis, in which a small number of patients develop severe localized bronchiectasis



# Origin of bronchiectasis

- Patients with alpha 1-antitrypsin deficiency have been found to be particularly susceptible to bronchiectasis, for unknown reasons.
- Other less-common congenital causes include primary immunodeficiencies, due to the weakened or nonexistent immune system response to severe, recurrent infections that commonly affect the lung.

# Origin of bronchiectasis

- **Acquired bronchiectasis** occurs more frequently, with one of the biggest causes being
- tuberculosis, non-tuberculosis mycobacteriosis (NTM), measles, whooping cough

commonly leads to bronchiectasis, either from bronchial stenosis or secondary traction from fibrosis.



# Diagnosis

- The diagnosis of bronchiectasis is based on the review of clinical history and characteristic patterns in high-resolution CT scan findings.
- In one small study, CT findings of bronchiectasis and multiple small nodules were reported to have a sensitivity of 80%, specificity of 87%, and accuracy of 80% for the detection of bronchiectasis.

# Treatment

- Treatment of bronchiectasis is aimed at controlling infections and bronchial secretions, relieving airway obstruction, and preventing complications.
- This includes the prolonged usage of antibiotics to prevent detrimental infections, as well as eliminating accumulated fluid with postural drainage and chest physiotherapy.
- **Surgery** may also be used to treat localized bronchiectasis, removing obstructions that could cause progression of the disease.

# Treatment

- Inhaled steroid therapy that is consistently adhered to can reduce sputum production and decrease airway constriction over a period of time, and help prevent progression of bronchiectasis.
- Use of inhalers such as albuterol (salbutamol), and ipratropium (Atrovent) may help reduce likelihood of infection by clearing the airways and decreasing inflammation.

# Prevention

- In order to prevent future development of bronchiectasis, an x-ray of the chest should be taken after any severe attack of measles, whooping cough or other acute respiratory infection in childhood.
- While smoking has not been found to be a direct cause of bronchiectasis, it is certainly an irritant that all patients should avoid in order to prevent the development of infections (such as bronchitis) and further complications.

# Prevention

- A healthy body mass index, vaccination (especially against pneumonia and influenza) and regular doctor visits may have beneficial effects on the prevention of progressing bronchiectasis.

# Chronic obstructive pulmonary disease (COPD)

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# Definition

- COPD is a preventable and treatable disease with some significant extrapulmonary effects that may contribute to the severity in individual patients.
- Its pulmonary component is characterized by
- **airflow limitation that is not fully reversible.**

**The airflow limitation is usually progressive and**

**associated with an abnormal inflammatory response of the lung to noxious particles or gases.**



# Cigarette smoking

- **The major risk factor.** Smokers have higher death rates for chronic bronchitis and emphysema.
- Cigarette smokers also have a greater annual rate of **decline in FEV1.**
- Age of starting, total pack- years, and current smoking status are predictive of COPD mortality.
- For unknown reasons, presumably related to constitutional differences, only about **50% of cigarette smokers develop clinically significant COPD.**

# Passive smoking

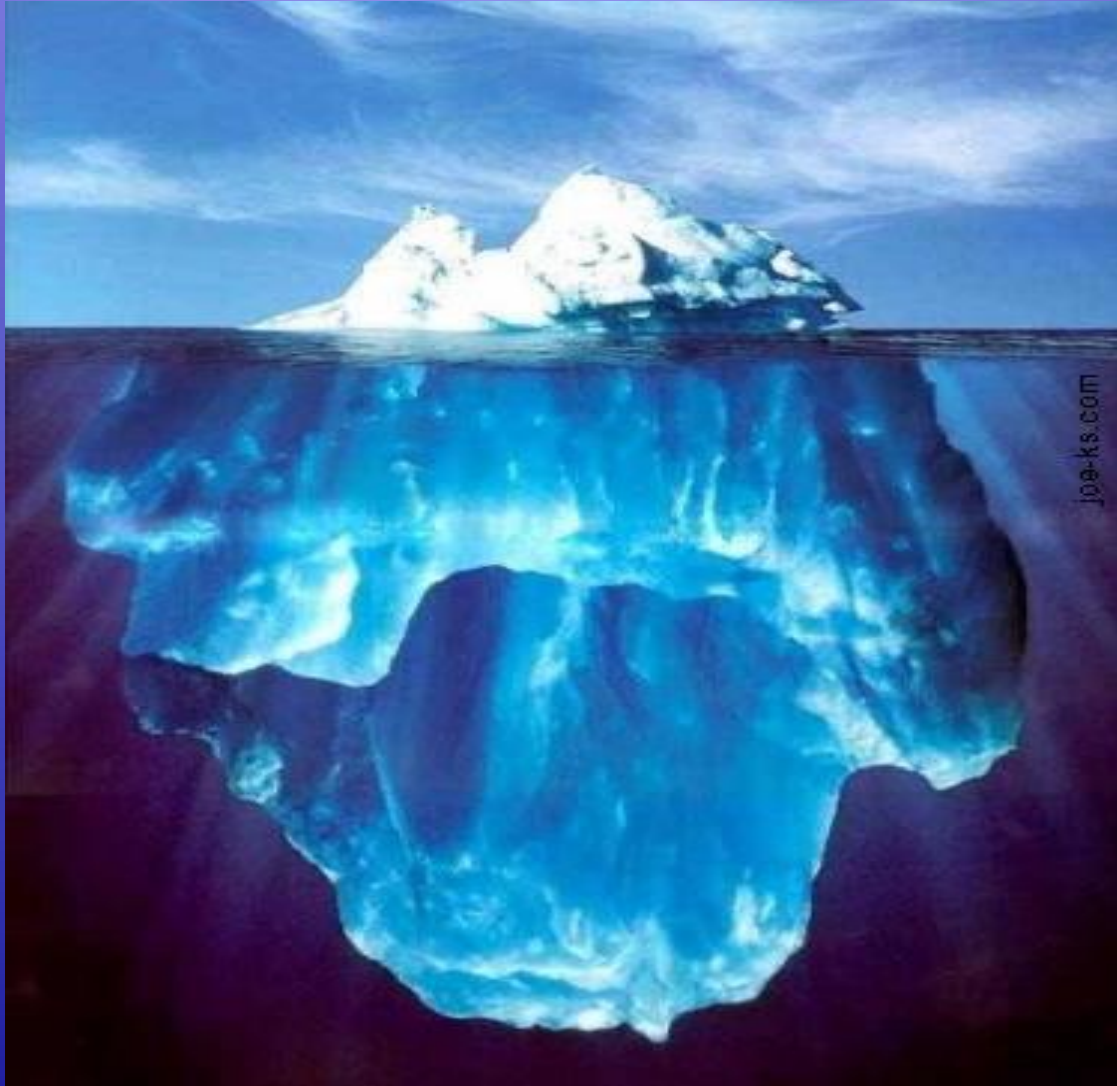
- **Exposition of passive smoking at least 40 h/week per 4 years increases the risk of developing COPD at 48%.**

# Other risk factors:

- Risk factors:
- ambient air pollution
- hyperresponsive airways
- sex, race and socioeconomic status
- occupational factors
- alpha1- antitrypsin deficiency



# Iceberg



# Symptoms typical of COPD

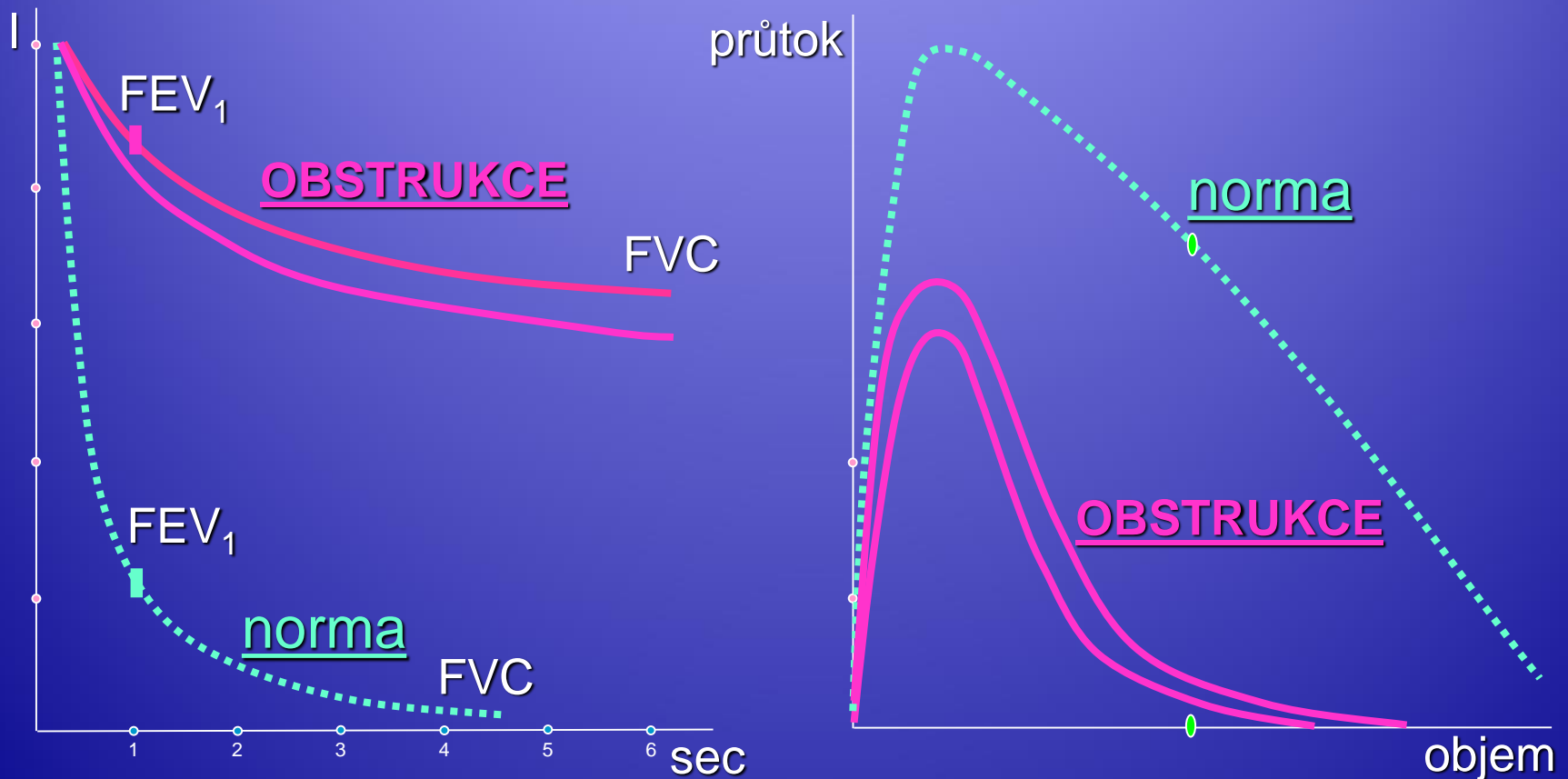
- history of heavy smoking for many years
- **cough and sputum production for many years**
- sputum usually mucoid - becomes purulent with exacerbation of disease
- onset of **breathlessness on exertion** with wheezing or tightness of chest
  
- some develop increasingly **severe exacerbations** of disease leading to chronic respiratory failure and heart failure - the „blue bloater“ type of COPD
  
- others have little or no sputum or hypoxia at rest, but breathlessness and wheezing is severe and emphysema is prominent - the „pink puffer“ type of COPD. These patients are commonly underweight
  
- most patients with COPD present with a mixed pattern



# Physical examination

- large, barrel-shaped chest
- low, flat diaphragm causing costal margin retractions on inspiration
- diminished breath sounds, distant heart sounds
- **prolonged expiration with generalized wheezing predominantly on expiration**
  
- the „**blue bloater**“ type of COPD patient may also have:
  - cyanosis at rest or mild exertion
  - oedema of ankles
  - crackles at lung bases
  - loud second heart sound in pulmonary area
  
- the „**pink puffer**“ type of COPD patient may also have:
  - expiratory pursed-lip breathing ( auto-PEEP)
  - thin body build

# Diagnosis of CHOPD – spirometric investigation



Reverzibilita: FEV<sub>1</sub> o 12% proti klidové hodnotě a také o 200 ml



# Bronchodilator treatment

- reduction in pulmonary hyperinflation - making breathing more comfortable and reducing the work of breathing
- **increase in exercise tolerance**
- changes in **mucociliary clearance**
- **improvement in respiratory muscle function** - although this is unlikely at the doses of drugs used clinically

# Treatment

- **sympathomimetic bronchodilators**
- **anticholinergic bronchodilators**
- **inhaled corticosteroids**
- **inhaled mucolytic agents**

# Long-term domiciliary oxygen treatment (LTOT)

- Studies have shown that **LTOT** improves survival in patients with COPD and chronic respiratory failure
- Criteria for LTOT are respiratory failure during a stable 3-4 week period despite optimal therapy, with **PaO<sub>2</sub> < 7,3 kPa (55 mm Hg)**, with or without hypercapnia
- LTOT should be used for as many hours as possible, the minimum recommendation is **15 h/day, including during sleep**

*Thank you for your attention and  
be successful*

