Chronic obstructive pulmonary disease (COPD)

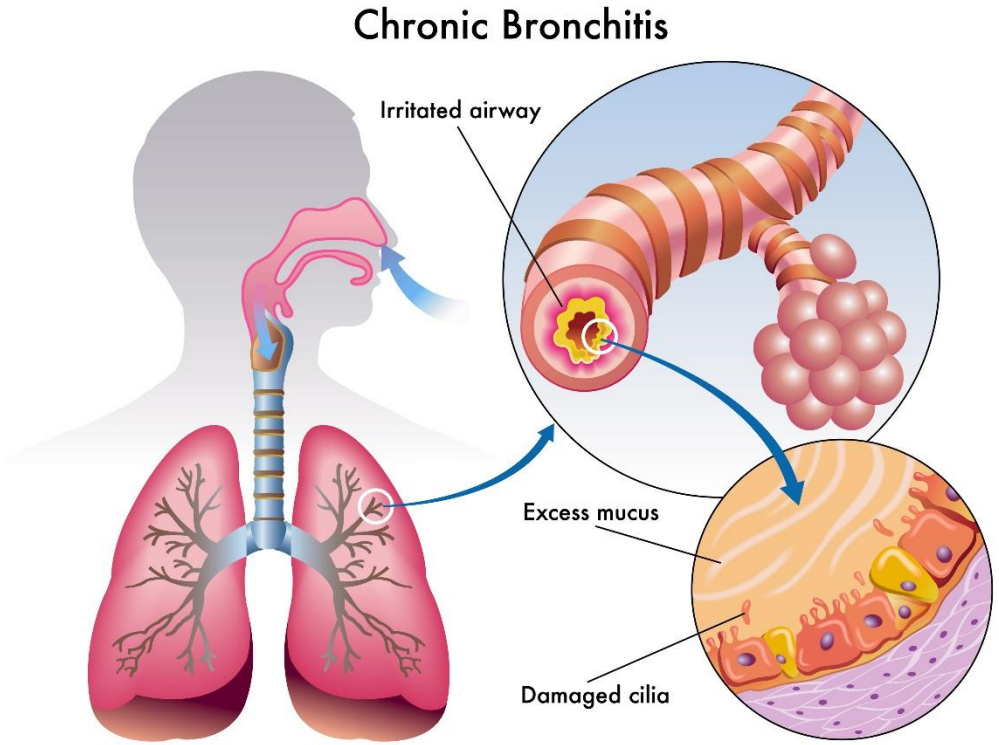
Unit: Understanding medical conditions for exercise referral

Chronic obstructive pulmonary disease (COPD)

- The term used by clinicians for conditions characterised by irreversible airflow limitation
  - Chronic bronchitis
  - Emphysema
- Airflow obstruction is usually progressive and not reversible
- It can be treated but not cured
- Early diagnosis and intervention
  - can slow the decline in lung function
  - lengthen the period in which a person can enjoy an active life.

Chronic bronchitis

- The result of lung damage and inflammation in the large airways.
- Classified as a cough with sputum production on most days for 3 months of a year, for 2 consecutive years+.



Emphysema

- The result of lung damage and inflammation of the air sacs (alveoli).
- Leads to a reduction in the surface area available for the exchange of oxygen and carbon dioxide.
- Reduces the elasticity of the lungs.
- Results in a loss of integrity and support for the airways causing further limitation to airflow.

Prevalence

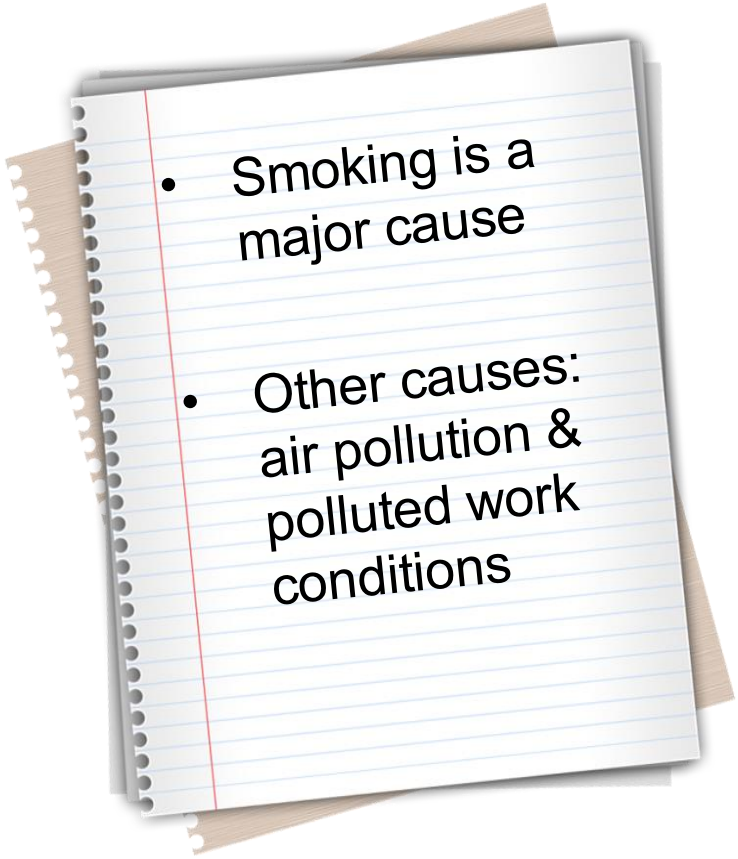
- Estimated 3 million people in the UK
- Only an estimated 900,000 are correctly diagnosed
- Global prevalence estimated to range from 4% to up to 20% in adults over 40 years of age
- Women more susceptible than men

Cost to the nation

- Direct costs:
  - Estimated between £810-£930m per year in the UK
- Indirect costs:
  - impact on annual productivity
  - estimated 24 million lost working days per annum

Pathology

- The lining of the airways become inflamed and thickened
- Airway limitation is caused by an increase in the number and size of mucous glands
- Changes in lung tissue contribute to further airflow reduction
- Increased resistance in the airways
- Breathing harder
- Respiratory muscles become fatigued
- In severe cases, respiratory failure



Presentation

- Most common symptoms
  - shortness of breath (dyspnoea).
  - in early stages, dyspnoea noticeable during vigorous exercise

- Other symptoms of COPD include:
  - a persistent cough with phlegm that never seems to go away
  - frequent chest infections, particularly in winter
  - wheezing, chest tightness and tiredness

Risk factors

- Cigarette smoking is the single most important risk factor
- Exposure to environmental pollutants
  - dust
  - chemicals
- Genetic factors

Part two

ACCEPTED TREATMENTS

Pharmacological intervention

- Medication aims to:
  - prevent and control symptoms
  - reduce the severity and frequency of exacerbations
  - improve health status
  - improve exercise tolerance

Common medications

- Bronchodilators
  - beta$_2$ agonists
  - anticholinergic drugs (antimuscarinics)
- Steroids (glucocorticosteroids)
- Methylxanthines (caffeine-like drugs)
- Phosphodiesterase-4 inhibitors

Side effects may include

Beta$_2$ agonists

- Tremors, tachycardia (and palpitations)

Anticholinergic drugs (antimuscarinics)

- Dry mouth, urinary retention, constipation, palpitations

Steroids (glucocorticosteroids)

- Long term use - loss of bone density, muscular weakness, thinning of skin, systemic hypertension, weight gain

Medication and exercise

- Bronchodilators and methylxanthines
  - improve exercise capacity
  - potential side effects may include tachycardia and increased dyspnoea.
  - medication should still be taken as normal before exercise

- Thiazide diuretics (to control fluid retention)
  - Clients may experience hypotension during exercise

Lifestyle intervention

- May include:
  - Exercise
  - Smoking cessation
  - Dietary modification
  - Pulmonary rehabilitation

Part three

EXERCISE GUIDELINES AND CONSIDERATIONS

Rationale for exercise

- Benefits include:
  - cardiovascular reconditioning
  - improved ventilatory efficiency
  - reduced ventilatory requirement at a given workload
  - desensitization to dyspnoea
  - increased muscle strength
  - increased flexibility
  - assists management of anxiety/depression

Exercise guidelines

Mode of exercise	FIT principles
Aerobic	• RPE 11-13/20 (comfortable pace) • 1-2 sessions, 3-5 days/week • 30mins per session (shorter intermittent sessions may be necessary initially) • Monitor dyspnoea • Emphasise progression of duration rather than intensity
Resistance	• Low resistance, high reps • 2-3 days per week
Flexibility	• 3x per week
Neuromuscular	Daily

Adapting exercise

- Use an accumulated approach to build activity levels
- Lower intensity
- Exercise mid to late morning, as symptoms are often worse upon waking
- Avoid extremes of temperature and humidity, can exacerbate symptoms of breathlessness.
- Use breathlessness scale
- Clients become more short of breath when lying down (floor exercises) and they may also have difficulty getting back up

Comorbidities

- Consider
  - Any change in risk stratification?
  - Effects of medications
  - Exercise recommendations for other conditions
  - Further adaptations and modifications?