Asthma

Unit: Understanding medical conditions for exercise referral

Asthma

- Chronic inflammatory disorder of the airways
  - airway hyper-responsiveness
  - airflow obstruction
  - often reversible spontaneously or under treatment.
- Allergen sensitization is an important risk factor
- Asthma is often associated with rhinitis
  - an inflammation of the nasal mucosa

Classification

Clinically classified according to the severity and frequency of symptoms

Severity in clients (>12 years of age)	Symptom frequency
Intermittent	≤2 per week
Mild persistent	>2 per week but not daily
Moderate persistent	Daily
Severe persistent	Throughout the day

Prevalence

Countries reported to have a prevalence of greater than 10% of the population include:

- UK
- USA
- South America
- Australia

5.2 million people in the UK have asthma

- number of adults has increased by 400 million since the last audit in 2001
- proportion of children diagnosed increased from 4% to 10% between 1964 and 1989

Cost to the nation

- Estimated total cost in UK £2,237 million.
- Lost productivity accounts for £1,226 million
- Direct costs to the NHS approximately £889 million
- £161 million in benefits (Asthma UK, 2005)
- Emergency hospital admissions more than £45.8 million a year

Pathology

Caused by:

- genetic factors
- environmental factors (that trigger asthma)

The allergic response during an asthmatic episode narrows and/or obstructs the airways by the following mechanisms:

- contraction of the airway smooth muscle (bronchoconstriction)
  - directly under neural control
  - indirectly as a result of local release of histamine
- triggered inflammation of the tiny mucosal glands in the lining of the airways
- production of mucous secretions

Presentation

Common symptoms include:

- coughing, especially at night
- wheezing
- shortness of breath
- chest tightness, pain or pressure

Early warning signs

- Frequent cough, especially at night or on waking
- Losing your breath easily or shortness of breath
- Feeling very tired or weak when exercising
- Wheezing or coughing after exercise
- Decreases or changes in lung function as measured on a peak flow meter
- Signs of an allergy (sneezing, runny nose, cough, nasal congestion, sore throat, and headache)
- Trouble sleeping

Risk factors

- Family history of atopic disease
  - e.g. asthma, eczema, allergic rhinitis, or allergic conjunctivitis
- Co-existence of atopic disease
- Gender
  - Male (for pre-pubertal asthma)
  - Female (for persistence of asthma from childhood to adulthood)
- Bronchiolitis in infancy
- Smoking, including perinatal and secondary exposure to tobacco smoke
- Low birth weight
- Premature birth

Part two

ACCEPTED TREATMENTS

Pharmacological intervention

- Pharmacological intervention is used to prevent and control asthma symptoms, as well as reduce the severity and frequency of symptoms

Common medications

- Generally four groups of drugs commonly used to treat asthma:
  - bronchodilators – widen the airways and are often prescribed in the form of an inhaler
  - steroids - reduce the inflammation in the airway linings
  - caffeine-like drugs - relax tight muscles in the airways
  - mast cell stabilisers – suppress early and late inflammatory responses

Medications

Inhalers colour coded to differentiate the drug classes, usually:

- **BLUE:**
  - Reliever - Short-acting Beta-agonist
- **BROWN or ORANGE or BURGUNDY:**
  - Preventers – Corticosteroid
- **GREEN:**
  - Long-acting Beta-agonist
- **PURPLE or RED or *WHITE*:**
  - Long-acting Beta-agonist/Corticosteroid combination

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

To improve asthma symptoms:

- smoking cessation
- weight reduction (in obese people)

Part three

EXERCISE GUIDELINES AND CONSIDERATIONS

Rationale for exercise

- Not shown to improve measurements of lung function
- Some studies show:
  - oxygen consumption and work capacity increase significantly with regular exercise
  - reductions in airway responsiveness
- Some research has indicated that asthmatics who exercise regularly:
  - have fewer episodes
  - use less medication
  - have less time off work or school

Exercise considerations

Identify realistic goals

- **physiological fitness**
  - suitable for those with EIA only, or mild asthma
  - should be a 6-week preparatory period where the client learns to self-monitor exercise intensity (Borg scale)
- **exercise tolerance** (not necessarily fitness)
  - suitable for individuals with moderate to severe asthma
  - encourage clients to exercise at a level that represents a high percentage of their maximal exercise tolerance
  - individuals with ventilatory limitations use the Borg scale.
- **musculoskeletal conditioning**
  - suitable as an introduction for very sedentary clients, or as a recovery programme
  - use circuit training principles to reduce the likelihood of exercise-induced asthma.

Exercise recommendations

Mode of exercise	FIT principles
Aerobic	• RPE 11-13/20 • 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	Recommendations for flexibility for those with asthma are the same as those for the general population
Neuromuscular	Daily

Other considerations

- Exercise-induced asthma
- Warm-up activities
- Interval training
- Psychological factors
- Monitoring the patient

Comorbidities

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