Hypertension

Unit: Understanding medical conditions for exercise referral

Hypertension

- When blood pressure remains higher than normal over time
  - at least several months
- The heart has to use more energy to pump against the greater resistance of the vascular system
  - Over time the heart may thicken and stiffen (myocardial hypertrophy)
- May lead to:
  - angina pectoris
  - myocardial infarction (heart attack)

Classification

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Optimal blood pressure	<120	<80
Normal blood pressure	<130	<85
High-normal blood pressure	130-139	85-89
Grade 1 hypertension (mild)	140–159	90–99
Grade 2hypertension (moderate)	160–179	100–109
Grade 3 hypertension (severe) ***NB: Exercise is contraindicated.***	≥180	≥110
Isolated systolic hypertension (Grade 1)	140–159	<90
Isolated systolic hypertension (Grade 2)	≥160	<90

Prevalence

- Estimated 40% of the adult population in England and Wales are hypertensive
- Prevalence is higher among men (31%) than women (28%) up to age 64
- Around half of men on anti-hypertensive medication had controlled blood pressure

Cost to the nation

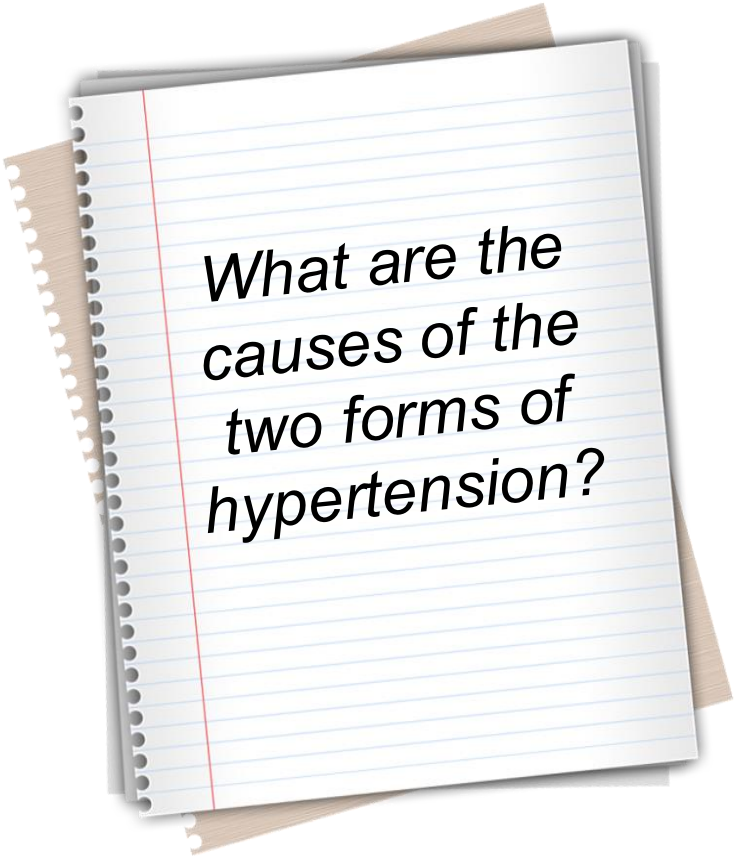
- Hypertension and related conditions incur direct costs in the form of drugs, interventions and clinician time

- Hypertension is a contributory factor in ischaemic heart disease and cerebrovascular disease, which result in 4 million bed days annually, 8% of the total capacity of the NHS

- In 2001, the NHS in England funded 90 million prescriptions for anti-hypertensive drugs at a cost of £840 million

Pathology

- Two forms of high blood pressure have been described:
  - essential (or primary) hypertension
  - secondary hypertension



Presentation

- Mild to moderate hypertension may be present without symptoms
- Symptoms include: chest pain, breathlessness, transient visual loss, headaches and wheezing
- A transient ischaemic heart attack or stroke is the first indication for many
- Hypertension is often referred to as ‘the silent killer’

Diagnosis and treatment: ‘Rule of halves’

- The rule states that:
  - only 50% of people with hypertension are diagnosed
  - only 50% of those diagnosed are treated with drugs
  - only 50% of those treated are controlled effectively

Risk factors

- age
- ethnicity
  - Higher prevalence for black Caribbean men and women
- family history
- diet
  - high salt intake, low potassium intake, high alcohol intake
- inactivity
- smoking
- psychosocial stress

A reduction of 5-6 mmHg in blood pressure sustained over a five-year period may reduce:

- ***coronary events by 20-25%***
- ***strokes by 35-40%***

Part two

ACCEPTED TREATMENTS

Pharmacological intervention

- Antihypertensive drugs:
  - can be prescribed alone or in combination
  - aim of controlling blood pressure, while minimising side effects or toxicity
  - represent a life-long treatment strategy

Common medications

- Thiazide-type diuretics
- Potassium-sparing diuretics
- Beta blockers
- Angiotensin converting enzyme inhibitors (ACE inhibitors)
- Angiotensin II antagonists
- Calcium channel blockers
- Alpha blockers
- Centrally acting drugs

Side effects may include

- Bradycardia
- Hypotension
- Heart failure
- Gastrointestinal disturbances (nausea and vomiting)
- Fatigue, sleep disturbances
- Headaches,
- Flushing to face
- Ankle swelling, ankle and foot pain
- Constipation,
- Dry cough,
- Renal impairment
- Rash

Lifestyle intervention

This may include:

- Exercise & physical activity
- Dietary modification
- Relaxation techniques
- Alcohol, caffeine and salt reduction
- Smoking cessation

Part three

EXERCISE GUIDELINES AND CONSIDERATIONS

Rationale for exercise (benefits)

- Reduced mortality rates than sedentary individuals
  - physically active individuals with hypertension
  - individuals with higher levels of cardiorespiratory fitness
- Proposed mechanisms by which exercise lowers blood pressure include:
  - neurohumoral (activity of sympathetic nervous system)
  - vascular, structural adaptations
- Research suggests moderate-intensity (40–70% VO2 max) aerobic exercise
  - associated with a significant reduction of blood pressure in hypertensive and normotensive participants

Exercise recommendations

Mode of exercise	FIT principles
Aerobic	• 40%-80% peak heart rate • 40%-60% VO_2R or maximal heart rate reserve • RPE 11-13/20 • 4-7 days/week • 30-60mins per session
Resistance	• 1 set 8-12 reps • 60%-80% 1RM
Flexibility	Same recommendations as general populations

General considerations

- Longer warm up and cool down
- More gradual tapering of intensity
- Moderate intensity main activity (reduced repetitions and resistance and lower working heart rate etc)
- Ensure correct breathing (no breath holding)
- Discourage isometric work (e.g. excessive tension or gripping)
- Avoid heavy resistance training, high intensity
- Avoid any sustained overhead movements
- Avoid inverted exercises (e.g. yoga head and shoulder stands, downward dog)
- Be sensitive to exercise environment effects (e.g. blood pressure increases on entry to a swimming pool; and in higher temperatures)

Medication and exercise

- Many antihypertensive drugs cause hypotension during or after exercise
  - avoid sudden changes in position (to avoid postural hypotension)
  - keep feet moving throughout the exercise session
  - ensure an adequate cool down period to prevent hypotensive episodes

Comorbidities

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