This article, part two in a three-part series, examines arterial pathology and dysfunction, and the main treatment modalities for common arterial diagnoses, including aneurysms, transient ischaemic attack and hypertension – common conditions that nurses will see frequently in both the ward and critical care environments. Nurses should be aware of the medical management and nursing care of these conditions in order to optimise and improve clinical outcomes.

Aneurysm
Aneurysm descends from the same Greek word which means ‘to widen’ and is classified when the aneurysm reaches 1.5 times the size of the artery where it is situated (O’Gara, 2003). An aneurysm is an abnormal bulge in the wall of a blood vessel (Figure 1), which can form in any blood vessel, but occur commonly in the aorta – the main blood vessel leaving the heart (Tortora and Grabowski, 2002). The two main types of aortic aneurysm are thoracic aortic aneurysm (part of the aorta in the chest) and abdominal aortic aneurysm (O’Gara, 2003).

A recent study looked at abdominal aortic aneurysm growth (those less that 45mm) in a national population with other related cardiovascular risk factors. It found that hypertension, diabetes and blood lipids only had a very minor influence in aneurysm growth and size, but that smoking did appear to influence growth (Brady et al, 2004). The study advocates the monitoring of aneurysms that are less that 45mm in size yearly or less.

Small aneurysms are not clinically significant on the whole, but patients will be at increased risk of:
- Atherosclerotic plaque formation at the site of the aneurysm or a clot (thrombus) may form and dislodge into the blood stream causing arterial occlusion and resultant tissue hypoxia and death;
- Increase in the aneurysm size or aneurysm rupture because as the artery wall thins, it is fragile and may burst under stress. A sudden rupture of an aortic aneurysm is life threatening (O’Gara, 2003; Brady et al, 2004).

The main management points include early detection (usually CT scanning or sometimes manual palpation in accessible arteries), size limitation/
monitoring, and repair when the aneurysm becomes large and at risk of rupture. In terms of prevention, cardiovascular factors are seen as important – including smoking cessation, lipid lowering and blood pressure control – especially in the at-risk group, which tends to be males over 50 with a family history (O’Gara, 2003). Surgical repair involves an abdominal incision and the insertion of a synthetic tube at either side of the aneurysm, connecting both normal-sized arteries, and wrapping the aneurysm around the tubing (O’Gara, 2003). Stent grafting is becoming more common for those patients where the stent can be positioned using an arterial approach (Brady et al., 2004).

**Transient ischaemic attack**

A transient ischaemic attack (TIA) is a short episode of reduced blood supply causing temporary impairment and usually lasts for less than 4 hours (Brown et al., 2004). The reduced blood supply is usually caused by a thrombus (either plaque build-up or emboli from another part of the body) that causes a loss of function in the area of the body that is controlled by the portion of the brain affected (Figure 2). TIAS can occur once, multiple times, or before a permanent cerebral vascular accident (Brown et al., 2004).

Cerebral vascular accidents (CVA or strokes) take longer to resolve than TIAS and cause more permanent and serious problems. Although TIAS often last only a few minutes and then end, most experts believe they should be treated as a medical emergency in order to reduce further incidences or progression to stroke (Brown et al., 2004).

Current treatment modalities include (Albers, 2004; Brown et al. 2004):
- Blood pressure should be stable and reduced as per BHS guidelines (Williams et al., 2004);
- Cholesterol lowering with statins may be of significant benefit;
- Blood sugar stability in diabetic patients;
- Normal lifestyle health education around smoking cessation, alcohol consumption and exercise;
- Carotid endarterectomy for those patients where the stenosis is in this area;
- Antiplatelet therapy: aspirin, ticlodipine, clopidogrel, and aspirin and extended-release dipyridamole are acceptable options – although newer agents have been shown to be more effective than aspirin alone. Clopidogrel is recommended over ticlodipine due to having fewer adverse effects;
- Anticoagulation for those patients who have emboli of a cardiac nature (for example, atrial fibrillation). An INR of 2.5 should be aimed for.

TIAs are often warnings of a more severe or permanent stroke and must be immediately evaluated by the appropriate health care professionals (Albers, 2004). They also might be as a result of other medical conditions including atrial fibrillation, valve problems and myocardial dysfunction (Albers, 2004). TIAS and coronary heart disease can occur simultaneously and can reflect an underlying disease such as hyperlipidaemia, diabetes or hypertension (Albers, 2004). Professionals working with TIA or stroke patients should visit the www.stroke-tia.org website for more information.

**Hypertension**

High blood pressure (hypertension) is created when the blood is contracting with more force than normal through the arteries and is a common cardiovascular disorder (Tortora and Grabowski, 2002). The added stress on the arteries can accelerate atherosclerosis (Figure 3) and contributes to other disease processes such as myocardial infarction, heart failure, renal dysfunction and stroke (Tortora and Grabowski, 2002).

The effects of high blood pressure on the arteries are made worse when patients have diabetes, hyperlipidaemia, smoke or have diets high in saturated fats (Tortora and Grabowski, 2002; Simon, 2004). An unhealthy lifestyle can also be a cause of hypertension and 40 per cent of the population can successfully lower their blood pressure by making lifestyle adjustments. Some factors include:
- Hereditary factors;
- Obesity and lack of exercise;
- A high-salt diet and heavy alcohol consumption (Simon, 2004).

In most cases it is also necessary to take antihypertensive medication to minimise future risks related to hypertension – introduced at low doses and gradually increased if required. Each class of medication usually lowers blood pressure by 10-20mmHg and therefore a second or a third drug may be added to achieve good blood pressure control, accepted to be 140/90mmHg. However, recent evidence tells us that values less than 140/90mmHg will lead to further reductions in arterial stiffness and reduce rates of renal dysfunction (Koopmans et al., 2003). The main antihypertensive class of agents are (Williams et al., 2004):
- Diuretics;
- Beta-blockers;
- Calcium antagonists;
- Angiotensin-converting enzyme (ACE) inhibitors;
- Angiotensin II type I receptor (AT1-R) blockers.

The nurse’s role is to:
- Encourage healthy lifestyle changes;
- Improving self-management techniques of those patients with a hypertension diagnosis;
- Assisting in the monitoring of other cardiovascular risk factors;
- Providing health education and promotion around those risk factors.