Melbourne Vascular Imaging
ANKLE BRACHIAL INDEX

A method of quantifying the lack of blood supply to a leg is to compare the ankle artery (pedal artery) pressures to the brachial artery pressure.

A continuous wave, hand-held Doppler machine is used (instead of a stethoscope) with 12 cm wide blood pressure cuffs and a conventional sphymomanometer to measure the systolic pressure in the distal posterior tibial and dorsalis pedis arteries (PTA and DPA). The brachial artery pressure is divided into the highest of these pressures. The answer quantifies the distal leg artery perfusion. The brachial artery is usually equal to, or slightly less than the normal pedal artery pressure so a normal index is 1 or slightly greater. A reduced pressure in the leg would result in an index of less than 1.

An ABI of: 0.6 - 0.98: mild claudication
0.3 – 0.6: severe claudication
Less than 0.3: rest pain - ischemic ulcer unlikely to heal.

Ankle brachial indices can also give a guide to the likelihood of pedal tissue loss without vascular surgery.

Pressure > or = 60mm Hg: healing probable in the non-diabetic patient.
Pressure > or = 100mm Hg: healing probable in the diabetic patient.

After resting ABIs have been measured the patient can be exercised on a treadmill. Whilst on the treadmill the patient describes his symptoms which are recorded. Immediately after exercise the patients ABIs are re-tested till they equal the resting pressures. Sometimes the patient will have comparatively normal resting ABIs, which will change markedly during exercise. We tend to exercise all patients who can physically do so for this reason.

TOE BRACHIAL INDICES

Diabetic patients often have very calcified calf arteries (Monckeburgs sclerosis). The calf arteries become incompressible giving falsely high pressures. In these cases we measure the pressure in the great toe using a photoplethysmographic transducer which is taped to the toe. The transducer emits infrared light, which reflects off the returning blood flow after occlusion with a tiny digit cuff. We compare the toe pressures with the arm pressures but use different values (0.7 = normal toe brachial index).