PERFORMING THE ANKLE BRACHIAL INDEX

The ABI measurement is performed with the subject resting in a supine position. The examiner should make all arm and leg blood pressure measurements with an appropriately sized blood pressure cuff and the Doppler device. The brachial systolic blood pressure is determined in the left and right brachial arteries, and the ankle systolic blood pressure is determined in the right and left posterior tibial (PT). The ABI is determined by using the average of the two readings from the PT, and the average of the two readings from the brachial arteries on each side. The lower ABI of the two sides is then used for diagnostic purposes for the presence of Peripheral Arterial Disease (PAD).

ABI PROCEDURE

Step 1. Have the patient lie in a supine position with shoes, socks and stockings removed for at least 10 minutes prior to obtaining blood pressure measurements.
Step 2. Apply the blood pressure cuff snugly on the upper arm with the lower edge of the cuff 1 inch above that antecubital fossa. Usually the cuff that is the appropriate size for the patient's arm will also be suitable for the ankle pressure measurement. In the rare instance that upper arm and ankle pressures are markedly different, choose cuff sizes that are appropriate for each site.
Step 3. Apply a 1-2 centimeter ribbon of Doppler gel to the antecubital area. Be sure to use enough gel.
Step 4. Turn the Doppler probe on and place it at the antecubital area at approximately a 60-degree angle to the surface of the skin. Move the probe around until the clearest arterial pulse sounds are heard and keep the probe at that position.
Step 5. Inflate the blood pressure cuff to approximately 20 mm Hg above that numerical reading where the pulse sounds cease.
Step 6. Deflate the cuff at a rate of 2 mm Hg per second until the first arterial pulse sound is heard. When this number is determined, deflate the cuff completely and record this systolic reading. Repeat the procedure to obtain a second arm reading. Remove the gel from the patient's skin with a tissue.
Step 7. Apply the same blood pressure cuff snugly to the ankle on the same side of the body.
Step 8. Palpate the area around the medical malleolus to find the posterior tibial (PT) arterial pulse.
Step 9. If this pulse is palpable, apply a 1-2 centimeter ribbon of Doppler gel to the area. If there is no palpable pulse, apply gel to the general area, turn on the Doppler probe, and move the probe around until the clearest arterial sound is heard. Keep the probe in that position. Continue inflating the blood pressure cuff as before, followed by deflation and reading (Steps 5-6). Repeat the procedure for a second ankle reading.
Step 10. Apply the blood pressure cuff to the opposite ankle and record a set of the PT pressures as before (Steps 8-9).
Step 11. Then repeat steps 2-6 on the other arm twice to obtain 2 brachial readings.
Measurements should be noted in the measurement forms.

Some subjects, particularly some elderly and diabetic individuals, have calcification in their arteries that prevents occlusion of flow by the pressure cuff. This will cause an abnormally high reading. Typically any reading greater than 1.50 is considered abnormal. Such people should be referred for additional testing in a vascular laboratory.

HELPFUL HINTS

- Follow the instructions specific to the Doppler probe you are using.
- Be sure to use enough gel.
- Use a cuff size that is right for both arm and ankle of the patient.
- Be sure you're centered on the pulse when you take the reading; if you're off to the side, the reading will be low.
- Be aware of known diabetics with calcified vessels and abnormally high ABI.
- In a small percentage of patients, one of the ankle pressures will be nondetectable; use the detectable pressure for calculation the ABI.

Subjects with and ABI of 0.90 or less are diagnosed as having PAD and considered at increase risk for cardiovascular ischemic events. Prompt investigation and risk-reducing treatments are then warranted. Don't be discouraged if measuring the ABI seems slow or clumsy at first. Like any procedure, the ABI becomes easier to do with practice.