

Performing the ABI Test

The ABI measurement is performed with the patient 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 systolic blood pressure is determined in both arms, and the ankle systolic blood pressure is determined for the right and left posterior tibial (PT) and dorsalis pedis (DP) arteries. The ABI for each leg is determined by using the higher of the two readings from either the PT or DP arteries, and the higher of the two brachial readings. The lower ABI of the two is used for diagnostic purposes. An ABI measurement can usually be performed in less than 10 minutes. (See sample ABI worksheet.)

ABI Procedure

Step 1. Have the patient lie in a supine position with shoes 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 the 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 the 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. 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 medial 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).

Step 10. Palpate the dorsal arch of the same foot for the dorsalis pedis (DP) arterial pulse. Apply the Doppler gel and use the Doppler probe as before (Step 9).

Step 11. Apply the blood pressure cuff to the opposite ankle and record the PT and DP pressures as before (Steps 8–10).

Step 12. Then repeat Steps 2–6 on the other arm.

Use the ABI worksheet page to figure the patient's ABI. Measurements should be noted in the patient's medical record.

Both the DP and PT arterial pressures are measured to provide a complete assessment of the extent of PAD in each limb. Additionally, some patients may have a congenitally absent dorsalis pedis pulse.

Other patients, 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 patients 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 the 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 calculating the ABI.

Patients with an ABI value of 0.90 or less are diagnosed as having PAD and considered at increased 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.