

The ABI with Toe Examination with simpleABI PVR Systems

Please Read the User Manual first: This is a quick reference guide

Contraindications: Do not perform the exam on someone suspected of having acute deep venous thrombosis, and do not take an arm pressure in an arm with a shunt or dialysis graft.

Background: The ABI with Toe exam is typically performed after an ABI has been done, especially if the larger ankle arteries appear to be incompressible (pressure over 200mmHg) or anytime more information is needed about small vessel disease. The ABI with Toe is done using the PPG probe. The patient is supine and rested in a warm room.

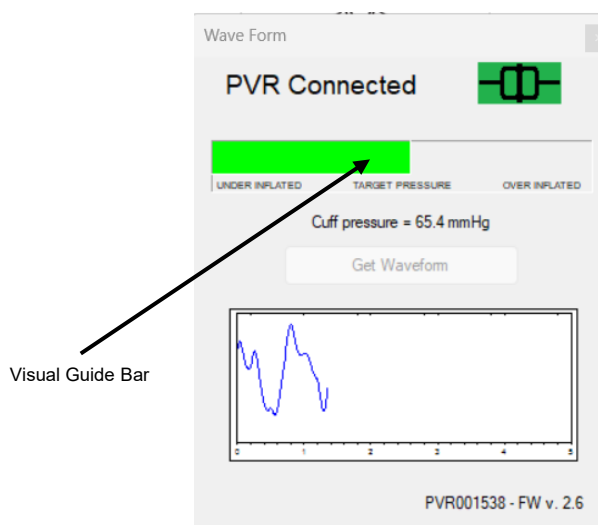
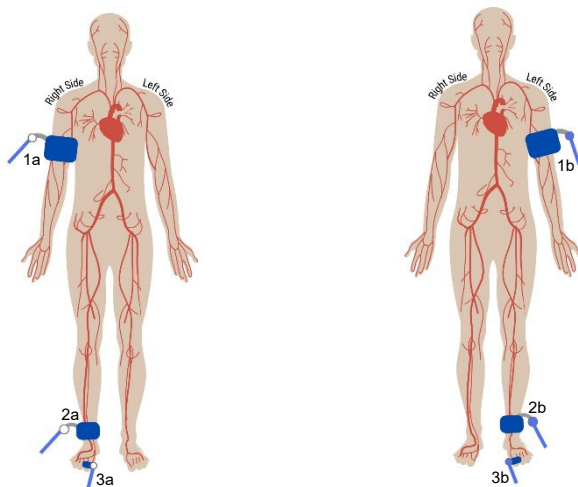
The ABI with Toe Procedure

Setting up

Opening the exam On the computer desktop, double click the simpleABI icon. When the program opens select *File* → *New* → *New ABI with Toe Report*. The report will open and you can enter patient information, risk factors, symptoms, ICD codes, etc.

Attaching cuffs Wrap appropriate cuffs at each site. The simpleABI PVR systems use a single blue tube that is moved from site to site during the exam. The blue tube goes to cuffs, Use "Y" connector to attach aneroid and blue tubing to PVR hardware.

Opening a previous exam If you have performed a previous ABI Exam, you may load the results into this exam by selecting *File* → *Load* → *ABI with Toe Report* and selecting **the ABI Exam you previously performed**.



Brachial Pressure (1a)

1. Begin with the right brachial. Attach hose to cuff. Place the Doppler probe at a 45 degree angle to the skin over the radial or brachial artery. Use plenty of gel and slowly move the probe laterally until the best signal is obtained. (You may also use the PPG sensor to listen for the pulse. If using the PPG, place the sensor on the fleshy part of the finger opposite the fingernail. Wait for consistent beeps from the system.)
2. Using the handheld aneroid, inflate the cuff until you no longer hear the signal - continue for an additional 10-20 mmHg.
3. The thumb button on the aneroid is a variable release mechanism – i.e. the more you depress the button the faster the deflation rate. Using the thumb release, deflate at the suggested rate of 2mmHg/second (10mmHg for every 5 seconds may be slightly easier to monitor)
4. When you hear the Doppler signal return, note the pressure from the aneroid. Enter that pressure into the right brachial field on the exam.

Ankle Pressures (2a)

1. Disconnect the hose from the brachial cuff and connect to the ankle cuff. Press tab or use the cursor to move to the Dorsalis Pedis (DP) field. Find the arterial signal using the Doppler probe on the dorsalis pedis artery on top of the foot. Obtain the arterial pressure in the same manner you did on the arm. (Using the aneroid, inflate until occlusion +10-20mmHg, release at 2mmHg/second, note pressure when Doppler signal returns)
2. Press tab or use the cursor to move to the Posterior Tibial (PT) field. Find the Doppler signal on the posterior tibial artery. Obtain the arterial pressure in the same manner as other sites.

Ankle Waveform

1. Press the Waveform Field on screen and a pop-up visual guide will appear. This pop-up guides you to correctly inflate the cuff for waveform acquisition. Inflate the cuff to roughly 80mmHg and deflate to roughly 65mmHg. You may take a proper waveform while the visual guide is green, as shown above (i.e. pressure is between 55-75mmHg and the visual guide bar is neither completely empty nor completely full). Press 'Get Waveform' Button and 5 seconds of PVR waveform will be captured.

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The ABI with Toe Procedure (continued)

Toe Pressure (3a)

1. Disconnect the hose from the ankle cuff and connect it to the toe cuff. Press tab or use the cursor to move to the toe pressure field. Find the arterial signal using the Doppler or PPG probe on the toe. Obtain the arterial pressure in the same manner you did on the arm. *NOTE* digit cuffs inflate rapidly. (Using the aneroid, inflate until occlusion +10-20mmHg, release at 2mmHg/second, note pressure when Doppler/PPG signal returns)

Toe Waveform

1. Press the Waveform Field on screen in the toe area and a pop-up visual guide will appear. This pop-up guides you to correctly inflate the cuff for waveform acquisition. Inflate the cuff to roughly 80mmHg and deflate to roughly 65mmHg. You may take a proper waveform while the visual guide is green, as shown above (i.e. pressure is between 55-75mmHg and the visual guide bar is neither completely empty nor completely full). Press 'Get Waveform' Button and 5 seconds of PVR waveform will be captured.

Left Side

1. Repeat the above pressures and waveform sequence for the left side of the patient. (See Exhibit B - 1b, 2b, 3b)

When finished, save or print the exam.

Helpful Hints

Cuff techniques:

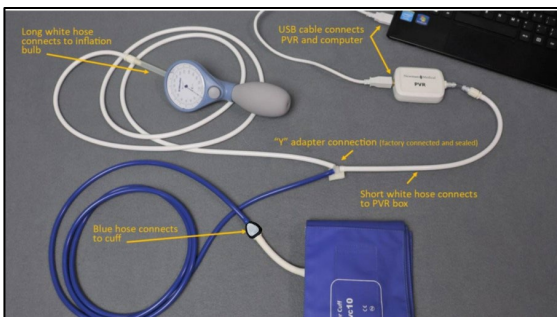
- Wrap the cuff snugly.
- Cuffs may be placed over thin clothing or stockings.
- Don't let the patient try to help by lifting their leg - as they relax their muscles the cuff will become loose.
- Placing a pillow under the patients heels may aid the examination.
- Have the patient remain as still and quiet as possible while taking the waveforms.
- If the patient has tremors that interfere with the waveform, having them perform a few dorsiflexions with their toes before taking the waveform may help.

Doppler techniques:

- Hold the probe like you would a pencil, close to the end.
- Move the probe back and forth laterally over the artery to obtain the best signal.
- Support the probe with your hand resting on the patient so that the probe does not move as the cuff is inflated and deflated.
 - One of the keys to a successful exam is being able to keep the probe in place as you inflate and deflate the cuffs.
 - If the probe moves, you may not be able to hear the Doppler sounds return and may have to repeat the inflation.

Exam hints:

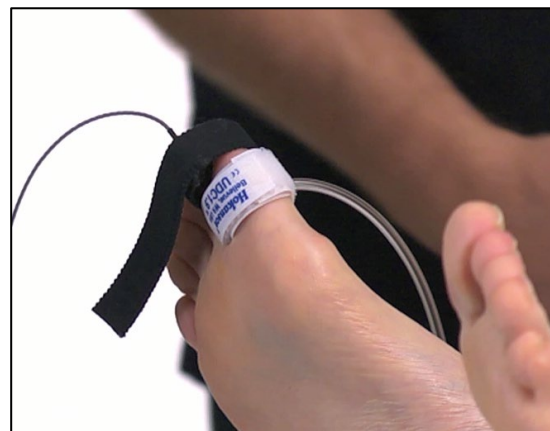
- A warm toe is a big help. Keep the toe covered if you can with a towel, even a warm towel if available. Let the patient rest and relax before inflating the cuffs. Anchor the cord from the PPG sensor to the foot with some adhesive tape.
- Toe pressures are difficult to obtain in patients with small vessel disease. Pressures can be obtained with the Doppler probe as well but it is more difficult as the digit arterial signal is hard to locate.



simpleABI PVR
Setup



PPG on finger



PPG & cuff on Toe