This Class II non-invasive instrument is the lowest-priced of our line of Doppler flow detectors, yet its sensitivity is equal to or better than that of any of our other models. It is available in operating frequencies from 8.0 to 9.9 MHz.

MODEL 801-B, with the appropriate probe, is used for all indirect systolic blood pressure measurements, for diagnosing vascular abnormalities in the limbs, neck and face. It is not suited for detection of fetal life or for the detection of bubbles in the right ventricle.

HOW IT WORKS: The principle of operation is the Doppler effect. Ultrasound energy at a repetition rate of about 10 million times a second is focused into the moving blood stream. The wavelength of the ultrasound energy is so small that a portion of the transmitted energy is reflected back from the individual red cells. When there is no blood movement, the frequency of the energy reflected back to the receiving crystal is the same as that which was sent and there is no sound. But with blood movement the frequency of the reflected waves is slightly different from that transmitted, so a sound is heard. The pitch of the sound depends upon the difference in frequency between the transmitted and reflected waves, and this frequency is proportional to the velocity of the blood. The sound heard is a hissing noise, the pitch of the hiss varying with the blood velocity. Therefore it is easy to discriminate between arterial and venous flow. The pitch variation during the cardiac cycle gives you diagnostic information on the arterial side and the pitch variation during the respiratory cycle over the deep venous system gives you information as to the patency of the deep veins.

APPLICATIONS: The Model 801-B may be used with a cuff and sphygmomanometer to make indirect systolic pressure measurements with accuracy approaching that of pressure measurements made with arterial puncture and a pressure transducer. The limitation in accuracy is dependent upon the proper fitting of the cuff to the patient’s arm. The Doppler takes the place of the stethoscope by indicating when blood is flowing under the cuff. At low pressures the stethoscope will not indicate systolic pressure accurately, the measurements being too low. When the stethoscope is absolutely useless, such as during cardiopulmonary bypass, on premature infants and whenever systolic pressure is low, the Doppler performs well. Pressure measurements as low as 10 mm. Hg. have been made on infants in surgery. One local hospital now requires that a Doppler be used on all hypothermia cases. Diastolic pressure can often be estimated if the Doppler transducer is placed just below the cuff. In general we say that if the systolic pressure is so low that you have to use the Doppler to measure it, you are not very concerned about diastolic pressure.
DIAGNOSING VENOUS DISEASE: With the Transcutaneous Doppler you can determine the patency of the deep venous system from the level of the posterior tibial vein at the ankle to the external iliac vein in the lower abdomen. This is accomplished by listening for the presence of the sounds of moving venous blood as they are normally heard adjacent to the major arterial supply to the leg. If the deep venous system is occluded, the venous sounds are not heard. In listening to a venous signal below the level of occlusion, the venous signal is usually continuous under resting conditions. If the venous signal does not change in pitch, indicating a change in velocity, as the patient takes a deep breath, the presence of venous hypertension is indicated.

The venous signal at the level of the posterior tibial vein under normal resting conditions is often inaudible. In order to establish its patency, certain maneuvers must be carried out. First, with the transducer positioned over the posterior tibial artery, the foot is suddenly compressed with the hand. This forces blood out of the foot through the deep veins, increasing its velocity and making it audible. Absence of a venous signal with this maneuver is a positive indication of venous obstruction. A second maneuver which has been found useful is to manually compress the posterior tibial vein as it courses proximal to the pickup site at the ankle. Under normal conditions there is no venous signal elicited at the ankle with compression. However, if the posterior tibial vein is patent, a sudden surge of venous flow will be noted on release of the compression. If a venous flow signal should be elicited during the compression phase, retrograde venous flow is indicated, presumably secondary to valvular incompetence. It is possible to place the probe over the external iliac, common femoral, superficial femoral and popliteal veins and determine their patency by the performance of compression and release maneuvers, both above and below the probe.

OTHER POINTS: There is a good reason for preferring headphones over a speaker for diagnostic work. You can hear much better with headphones for two reasons. One is that a small loudspeaker in a small cabinet does not have good low-frequency response. The Doppler shift is proportional to the velocity of blood flow, so low velocity flow produces low-pitched sounds. A set of stereo headphones will reproduce these sounds well, but a small speaker won’t. Another reason for headphones is that the ear is very inefficient at hearing low-frequency sounds when higher-pitched sounds are present, such as noise from fans, air conditioners, speech and footsteps. The headphones limit what you hear to sounds associated with blood movement plus a small residual noise in the device. We have provided two headphone jacks so that two sets of headphones can be used. Two sets are essential for teaching or demonstration purposes. There is no readout on this instrument, no means of connecting it to a recording device that will give you a graph. Think of it as a stethoscope for blood flow, one which gives you characteristic sounds for different flow rates and combinations of venous and arterial flow. The sounds are very easy to recognize, since venous flow is not pulsatile in the same way as arterial flow and can be easily stopped to leave the pure arterial sounds by simple means, such as clenching the fist. We think you’ll be amazed at what you can hear, and how easy you find it to trace the important arteries and veins.

PRICE: Includes one set of stereo headphones and one probe of your choice.

NOTE: For blood pressure use, order Model 801-B with a 15 degree flat probe instead of the pencil probe. If your intended use is primarily on infants, ask for the infant size. This size will work on adults too, it just does not anchor down as easily on adults as a larger probe.

Since probe failure can occur over time, we advise you to order an extra probe if you depend on the Doppler for daily use. You may find that you are very dependent on the Doppler and you risk considerable inconvenience by not having a spare probe. Use of ECG gel as a contact medium will destroy the epoxy covering the probe crystals and void the probe warranty. The Model 801-B operates from 8 penlight cells (size AA), available all over the world.

Manufactured in the U.S.A. by:

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