Hypertension and Vascular Disease

Device of the Month

Early screening device is critical for risk assessment
The CVProfilor provides an independent measure of small artery stiffness.
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The CVProfilor D0-2020 Cardiovascular Profiling System, the only FDA-approved and reimbursable device that provides a means of measuring large and small artery elasticity, should be more widely utilized in cardiovascular disease risk assessment and early screening, according to Jay Cohn, MD.

“The CVProfilor is a valuable device that should be in every physician’s office,” said Cohn, professor of medicine at the University of Minnesota Medical School, and director of the Rasmussen Center for Cardiovascular Disease Prevention.

At Rasmussen, Cohn and his colleagues are studying a variety of measures of early disease to identify people who need to be treated. The CVProfilor (Hypertension Diagnostics, Inc.) provides a measurement of the elasticity of the large and small arteries, and the device is used as part of the patient screening process.

Accepted by medical community

“We developed the methodology 25 years ago and have been working on it ever since,” Cohn told Today in Cardiology. “It is gradually being adopted in the medical community,” said Cohn, section editor of Today in Cardiology’s Myocardial Disorders, HF and Transplantation section.

The device is FDA-approved for screening for early abnormalities of the arteries, according to Cohn, who noted that there are a number of important aspects regarding its use as a screening tool.

“It is simple to use and it is reimbursable,” he said. “It’s quick and noninvasive, and it provides an independent measure of the stiffness of the large arteries and of the small arteries,” he said.

The distinction between large and small arteries is important, Cohn said. “Large artery stiffness is the result of structural changes over time. ... We know that when you get stiffening of the large arteries, it is a marker for people who have disease that are much more likely to have heart attacks and strokes. But it’s a late marker,” Cohn said.
“The small artery is sensitive to nitric oxide and to the endothelium. The first abnormality when endothelium becomes dysfunctional and nitric oxide is reduced is that the small arteries get stiff,” he said.

“This gives us a handle on early abnormalities of the artery wall, which are the foremarkers of subsequent events,” Cohn said.

Screening people for early endothelial abnormalities in the small arteries and identifying those at risk, Cohn said, can allow physicians to intervene earlier — before blood pressure goes up, patients’ arteries become stiff get plaque develops in their coronaries, among other problems. There are no other traditional methods of measuring arterial wall stiffness in small arteries, which is why Cohn and his colleagues sought to develop this methodology after they discovered it was a sensitive marker for early disease. They found that it was a better marker than blood pressure itself in identifying those with problems who need to be treated.

“We felt that blood pressure, which is all that’s been used, is a very insensitive, crude assessment of arterial wall stiffness. People with hypertension do have stiffer arteries than people with normal blood pressure, but blood pressure itself is not a very good discriminator between those people who have early stiffening of the arteries or those who don’t.”

**Other methods**

While pulse wave velocity — a measure of large artery stiffening — is used in some research settings, it does not measure small artery stiffening.

Flow-mediated dilation is a more tedious, difficult method used to visualize the brachial artery, according to Cohn. It has been used experimentally and is difficult to quantify, and it is also a measure of a large not a small artery.

A third method involves measuring a wave form picked up in the wrist and then manipulated by a computer transfer factor, which creates another wave form that can then be observed for late augmentation in systole. “That is not a measure of small arteries, but it does relate to [them],” Cohn said.

“Of these methodologies available today, the CVProfilor is the easiest to use and, to me, the most informative,” he said.

**Cuff replacement?**

Cohn didn’t see the device replacing the standard blood pressure cuff, but sees it as something that could augment it.

“You still need a blood pressure cuff, but the CVProfilor is incomparably important in adding to a blood pressure cuff and what you know about the arteries,” Cohn said.

“I cannot practice medicine effectively without having measurements of large and small artery elasticity. When I see a patient with a blood pressure of 140/90 mm Hg, I don’t know whether that person has abnormalities of the artery or it’s just sporadic elevated blood pressure. This [device] tells me that.

“When I see a blood pressure of 130/80 mm Hg or 140/90 mm Hg — in that range that most people are in — the CVProfilor tells me who needs to be treated and who doesn’t,” Cohn said.

While systolic blood pressure varies — from 150 mm Hg to 140 mm Hg or from 140 mm Hg to 130 mm Hg, for example — the percent of variation is small.

“It’s about a 5% difference that defines whether you have high blood pressure or normal blood pressure,” Cohn said.

With the CV Profilor, the measurements are usually a factor of a two-, three- or fourfold difference. Data provided by the device puts a normal range of small artery elasticity at eight, 10 or 12; an abnormal would be two, three or four.

“You immediately know whether you’re dealing with a normal or an abnormal. A blood pressure of 142/92 is abnormal; 138/88 is normal. There’s no discrimination whatsoever in those numbers because they’re so variable. That’s the reason it’s so much more helpful. The magnitude of the difference between normal and abnormal is so broad,” he said.

“The CVProfilor should be available in every office managing patients who are being screened for hypertension or have some risk for atherosclerosis or an abnormality that may need to be treated. The CVProfilor is critical,” Cohn said.

*Dr. Cohn is the inventor of this technology and is on the board of directors of Hypertension Diagnostics. He has a financial interest in the device mentioned in the article.*