Endothelial Dysfunction

CONSULTATION INFORMATION

The Urology Team, P.A.

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Endothelial Dysfunction has been recognized by the medical community as the critical junction between risk factors and clinical disease - it is the risk factor of risk factors. Simply put, it is the earliest detectable stage of cardiovascular disease.

Endothelial dysfunction (EtD) has emerged as a critical master pathway in the pathogenesis of both vascular disease and erectile dysfunction (ED). Normal vascular endothelium is essential for the synthesis and release of substances affecting vascular tone (e.g. nitric oxide; NO), cell adhesion (e.g. endothelins, interleukins), and the homeostasis of clotting and fibrinolysis (e.g. plasminogen inhibitors, von Willebrand factor). The degeneration of endothelial integrity promotes adverse events leading to increased atherogenesis (vascular disease) and to the development of vascular systemic and penile end-organ disease. The good news is that it is treatable, and unlike the atherosclerotic plaque which it causes, is is even reversible.

How is it measured?

Digital Thermal Monitoring (DTM) of vascular reactivity, is a new technique for vascular function evaluation in clinical settings. DTM is a noninvasive and inexpensive vascular function test that is simple and operator-independent. As shown in Figure 1, it is much like a blood pressure device with temperature probes. The probes measure fingertip temperature changes during a brief (2-5 minute) arm-cuff occlusion and release procedure (reactive hyperemia) which is a standard technique for assessment of vascular reactivity. Fingertip temperature drops during the cuff occlusion and rebounds after releasing the cuff. The higher the temperature rebound, the better the vascular reactivity.

What is the connection to UROLOGY?

ED and CV disease overlap in risk factors, pathological basis of disease and disease progression. The common underlying factor is endothelial dysfunction. The obvious reason why ED may present before other signs of CVD is because penile artery diameter is smaller (1–2mm) than the coronary artery (3–4mm) or carotid artery (5–7mm), and the relative percentage of endothelial and smooth muscle cells is higher in the penile arteries, meaning that symptoms associated with atherosclerosis occur sooner in the penis. The plaque size sufficient to cause ED, blocking blood flow through the penile artery, causes only 30–40% stenosis in arteries of greater diameter.
Endothelial Dysfunction

is the Precursor of:

- Sleep Apnea
- Stroke
- Dementia
- Alzheimer's Disease
- Raynaud's Disease
- Macular Degeneration
- Hypertension
- Heart Attack
- Heart Failure
- Angina
- Portal Hypertension
- Pulmonary Hypertension
- Renal Failure
- Erectile Dysfunction
- Pregnancy/Pre-Eclampsia
- Peripheral Arterial Disease (PAD)
- Diabetic Foot

and the Result of:

Smoking, Obesity, Inactivity, Poor Diet, Diabetes, Stress and Other Unhealthy Conditions.
Endothelial Testing

In simple terms, VENDYS® is a non-invasive device, intended for use as a diagnostic aid in the detection of coronary artery Endothelial Dysfunction (positive or negative) using a reactive hyperemia procedure. This procedure measures vascular reactivity which is a vital component of vascular function that enables adjustments of blood flow and alterations of vessel tone and diameter. Healthy arteries and vasculature will be more reactive than those that are unhealthy.

The results will indicate the 'health' of your peripheral arterial beds and demonstrate objective information about your cardiovascular health

VENDYS® uses a standard arm-cuff vascular reactivity procedure, which includes a temporary occlusion of blood flow in the arm. During the cuff occlusion, the lack of blood flow (ischemia) elicits a microvascular dilative response (opening small vessels). Upon releasing the cuff, blood flow rushes into the forearm and hand, not only restoring baseline flow but also resulting in an overshoot (reactive hyperemia). This overshoot causes shear stress in the larger (conduit) arteries, which stimulates these arteries (macrovessels) to dilate and accommodate the increased blood flow.

VENDYS® monitors, records, and analyzes fingertip temperature during the above cuff occlusion and release procedure. Temperature changes serve as a surrogate marker of blood flow changes that result from vascular reactivity.

The 15 minute VENDYS® test is non-invasive and you should be able to relax during the examination.

Step 1: Probe placed at fingertip
Step 2: Cuff Inflated
Step 3: Cuff deflated

Baseline finger temperature  Finger temperature drops  Finger temperature rebounds

VENDYS testing is appropriate for anyone who asks about their cardiovascular risk, or for anyone with one or more risk factors (high blood pressure, high cholesterol, men age > 45, women age > 55, smoking history, family history of heart disease). Further, any patient with an upcoming invasive surgery should be evaluated – male or female.
Endothelial Scoring

What do the scores mean?

There are three basic categories for the VENDYS Vascular Reactivity Index:

**Red Zone: Score of 1.0 and lower**
You do not have proper endothelial function and this could be an important signal of an imminent cardiac problem. This Vascular Reactivity score may indicate the presence of disease and that an immediate evaluation and intervention may be needed, whether it is aggressive medical therapy or a medical procedure. It’s imperative that endothelial health be restored. You should treat all modifiable risk factors aggressively. This is consistent with a general rule in medicine of matching the severity of disease with the intensity of treatment. Consider an imaging study (carotid ultrasound with CIMT measurement, or coronary calcium scan) to evaluate for subclinical atherosclerosis. Consider repeating VENDYS test in 2-6 months to assess response to treatment. Based on the repeat test result, decide on whether further treatment modifications are needed – will have a cardiology evaluation.

**Yellow Zone: Score between 1.1 and 2.0**
Your endothelium is reasonably healthy and while you don’t have any additional risk, you are still not in the well-protected Green Zone. It is vitally important that you now take charge of your own health and do everything you can to improve your score. Good health depends of certain lifestyle choice you make that include what you eat, how active you are, whether or not you smoke, the precautions you take to avoid injuries and accidents, and how you deal with tension and anxiety. The choice is yours. Choose health! You should treat all modifiable risk factors (including use of medications) and strongly encourage lifestyle modification. Consider repeating VENDYS test in 4-6 months to assess whether the newly prescribed treatments are helping. Based on whether the repeat VENDYS test result is better or worse, decide if treatment should be further modified or continued as is – likely will have a cardiology evaluation.

**Green Zone. Score greater than 2.0**
Your endothelium is functioning optimally, and you have maximum protection. Keep up whatever it is that you are doing, because the foods that you have been eating and the physical activity you have been performing regularly have affected a number of risk factors implicated in vascular health and longevity, particularly blood cholesterol levels, hypertension, and obesity. You should continue to control modifiable risk factors and encourage lifestyle modification. Consider repeating VENDYS test once a year.
Patient Instructions for Vascular Function Testing

Thank you for scheduling your appointment for testing at The Urology Team.

Fee Instructions

You will be required to make a $50.00 deposit prior to your testing. This deposit will be returned to you after your testing. If you do not cancel your appointment with a 24 hour notice, or if you miss your appointment, the deposit will not be returned. Make sure you know the charges and the co-payments for which you are responsible in advance of the test appointment. Our office staff and insurance department can help you obtain this information by calling 512-231-1456.

Should you need to cancel your studies, please notify us at least 24 hours in advance. Please call the office at 512-231-1444, and ask for appointments, to let them know if you need to make a change.

Test Instructions

Plan on arriving for your test 15 to 20 minutes prior to your scheduled appointment time. We want you to be in a relaxed cardiovascular steady-state and adjust to the temperature inside the building. You will need to be cool and relaxed for your testing.

Please do not eat anything 4 hours prior to your appointment. Consumption of food can interfere with your test results. Drinking water and taking necessary medications are ok. Avoid any caffeine. If you are taking a medication that may cause flushing, consult with your physician to find out if you should take this medication prior to testing.

Please do not wear any restrictive clothing that could interfere with blood flow to the arms. Heavy coats or clothes with thick sleeves should not be worn. Watches or rings or other jewelry on the hands and fingers should be removed.

All phones, beepers and other devices should be turned off to ensure quiet. You will not be doing any talking during the test so come prepared to relax and be comfortable.

After the procedure, a report will be printed out and given to your physician for their review. The results of your test will be discussed with you at your follow-up appointment. Please be sure to schedule your next appointment at our check-out window before leaving the office.

Being relaxed is the key to this procedure.
Endothelial Dysfunction (VENDYS®) testing is a specialized procedure provided by The Urology Team office. In preparation for the procedure, The Urology Team designates allocated time for staff, the procedure room, and orders specialized supplies. As a result, being late or canceling at the last minute hinders the practice’s ability to manager work flow and expense for the staff and the patient.

The Urology Team collects a $50.00 fee prior to the procedure that is applied if one of the following situations should occur:

- The patient calls to reschedule the appointment without giving the practice a 24-hour notice.
- The patient arrives greater than 30 minutes from the scheduled appointment time without notifying the office.
- The patient notifies the office that they will be 30 minutes late from the appointment time and arrives later than the approved time.
- The patient does not show up for the scheduled appointment.

The $50.00 fee is not applied to the expense of the procedure we will bill your insurance.

I understand the policy stated above. I understand that I will be reimbursed this fee when I come in for the scheduled procedure unless I did not follow the policy outlined above.

Patient Name (printed): ____________________________________________

Patient Signature: _____________________________ Date: _______________

Urology Team Signature: ________________________Date: _______________

$50.00 Collected Via:  □ Cash
□ Check
□ Credit Card #: _____________________________
    Expiry Date: __________

If you have questions, please call appointments at 512-231-1444