ADRENAL VEIN SAMPLING

Whenever possible the team from Interventional Radiology will meet with you and your family the day before the procedure. However we realize that questions often arise before coming to the University of Virginia, and we hope this list of commonly asked questions will help you. If you have further questions regarding Adrenal Vein Sampling, please contact the Interventional Radiology Staff at 434-924-9401 and ask for the nurse practitioner or Dr. John Angle.

WHERE ARE THE ADRENAL GLANDS LOCATED?
An adrenal glands is located just above the kidney on each side. The venous drainage of the adrenal glands is into the renal vein on each side.

WHAT IS THE FUNCTION OF THE ADRENAL GLAND?
The adrenal gland is divided into an outer cortex and an inner medulla. The adrenal cortex secretes hormones that are necessary for life. The medulla secretes hormones that regulate non-life threatening functions.

One of the hormones secreted by the cortex is aldosterone. Aldosterone regulates sodium (salt) and water within the body. A second hormone secreted by the cortex is cortisol. The third group of hormones secreted by the cortex is the sex hormones.

WHAT IS THE ROLE OF ALDOSTERONE IN BODY FUNCTION?
As previously stated aldosterone regulates sodium and water within the body. If there are high levels of aldosterone in the body, extra sodium (salt) is reabsorbed and more potassium is loss. The sodium reabsorption leads to an increase in the fluid levels in the body. Normally the kidneys can respond to the increase however patients usually have a mild to moderate increase in the blood pressure called hypertension.

WHAT ARE THE SYMPTOMS OF AN ELEVATED ALDOSTERONE LEVEL IN THE BODY?
Besides hypertension, patients with elevated levels of aldosterone may have high blood sodium, low blood potassium, high levels of potassium in the urine (the kidneys eliminate the potassium to maintain the balance of the electrolytes in your blood). As a result of the changes in the body electrolyte levels, a person may experience some or all of the following symptoms: hypertension very hard to control, muscle weakness, frequent urination, nighttime urination, headache, excessive thirst, muscle twitching and cramps.

HOW IS AN ELEVATED ALDOSTERONE FOUND?
By now, you have had multiple blood, and urine test to confirm that the levels of aldosterone in your blood are elevated. If while checking the aldosterone levels in your blood, your potassium was found to be low then your doctor may be concerned that you have a small benign tumor (noncancerous) called an adenoma in your adrenal gland causing a process called hyperaldosteronism.
IF MY ALDOSTERONE LEVELS ARE ELEVATED AND MY POTASSIUM LEVELS ARE LOW WHAT HAPPENS NEXT?
If your kidney function allows, your doctor will order either a MRI of the adrenal gland or a CT scan of the adrenal gland. The imaging may suggest the presence of a small tumor called an adenoma. However adenoma can occur and the patient does not have hyperaldosteronism. Therefore your doctor may ask that sample of the blood coming from the adrenal gland be obtained to verify that there is adenoma producing too much aldosterone.

WHAT IS ADRENAL VEIN SAMPLING?
Adrenal Vein Sampling is a procedure in which blood samples of a cortisol and aldosterone are obtained from the veins draining the adrenal gland. Aldosterone levels are elevated in patients that have aldosterone secreting tumors of adrenal gland.

HOW IS ADRENAL SAMPLING DONE?
First, we will explain the procedure and its risks to you. There is a standard form explaining the risks and benefits of the procedure, called a consent form, which we will also provide to you. You will be asked to read and sign this form. Before you go into the Interventional Radiology Suite a small intravenous catheter (commonly called an IV) will be placed in a vein in one of your arms. A blood sample will be drawn to check the potassium level in your blood. If the potassium level in your blood is low, you will receive potassium through your IV. You will then be taken to a special x-ray room. In the x-ray room, the skin on the front of your hip will be scrubbed with a special soap to reduce the risk of an infection. Next, the area will be numbed with a small injection of Lidocaine. A needle and then a small tube, called a catheter, will be placed in the big vein that comes close to the skin at the top of the leg in each leg. The catheters will be moved inside the venous system all the way to the veins at you kidney called the renal vein. From here it is further advanced to the vein draining the adrenal gland called the adrenal vein. Once the catheters are in position, a team of radiology staff will draw blood from the two of the catheters in the left and right adrenal vein. In addition, blood will be simultaneously drawn from a catheter in your leg. (These samples are used for comparison levels of Aldosterone and cortisol.) More samples will be drawn after a drug called ACTH to increase the amount of aldosterone produced by the adrenal gland is administered via your IV. Several sets of samples will be drawn over the course of hour.

Once all the samples have been drawn, you will be taken to the recovery room. The catheters in your legs will be removed and pressure will be held to the catheter site for several minutes. You will be given a blood thinner during the procedure, called heparin, which may delay the removal of these catheters. You will spend the night in the hospital to watch for any bleeding from the puncture sites. You should be able to go home the next morning, but you will be asked to avoid any lifting over 10 pounds for three days. Heavy straining may cause the puncture sites to start bleeding.
WHAT ARE THE RISKS ASSOCIATED WITH ADRENAL VEIN SAMPLING?
The most common risks associated with Adrenal Vein sampling include those associated with the placement of a catheter in a vein. These risks including bleeding at the puncture site (very rarely this is severe enough to require a blood transfusion), infection at the puncture site, or blood clot forming in the vein at the puncture site. There is always a risk of reaction to x-ray contrast or to the other medications you receive during the procedure. Anytime catheters are advanced near the adrenal gland there are the risks of intraadrenal (bleeding within the adrenal gland) bleeding, and damage to the adrenal gland. These problems are very uncommon (occurring in less than 1% of patients) but are very serious.

WHAT CAN I EXPECT AFTER THE SAMPLING?
You will be observed overnight in a hospital bed. You will be asked to stay flat in bed for 2 hours after the catheters have been removed. Then the head of the bed will be elevated for 2 hours. After that time you will be allowed out of bed to go to the bathroom but asked to stay in the room. You can eat your regular diet.

WHEN CAN I GO HOME?
Discharge is usually around 8-8:30 AM the day after the sampling.

CAN I RIDE IN A CAR THE DAY I AM DISCHARGED?
Yes, you can ride in a car the day of discharge, but we prefer you not be the driver. If you are traveling for a long period of time, please move your feet frequently and stop and walk for at least 5 minutes every two hours to reduce the risk of blood clots in your legs. Drink plenty of fluids.

WHAT RESTRICTIONS WILL I HAVE AFTER THE PROCEDURE?
We ask that you not drive for 24 hours after discharge from the hospital. You should avoid lifting anything over the weight of a gallon of milk (about 10 pounds) for 72 hours as well.

WHAT SPECIAL THINGS DOES THE TEAM NEED TO KNOW TO HELP PREPARE ME FOR THE PROCEDURE?
You need to tell the Interventional radiology team if you are allergic to any medicines including x-ray contrast (IVP dye, IVP contrast, CT contrast). The team may need to prescribe a special medicine to reduce the risk of having another allergic reaction to x-ray contrast in order to complete this test. The team needs to know if you have diabetes and what drugs you use to control your sugar (glucose). Your diabetic drugs will be reduced for the procedure. If you are on blood thinners, such as Coumadin (Warfarin), please let the interventional radiology team know so they can adjust your medications prior to the procedure. Your blood pressure medications may need to be adjusted so that the best response from the sampling will be obtained. Generally we will ask that you hold drugs such as spironolactone or inspira.

WHAT DO I NEED TO DO TO PREPARE FOR THE PROCEDURE?
The night before the procedure, you should eat your normal diet. After midnight you should not eat any solid foods. Unless otherwise instructed the morning of the procedure, drink at least two 8-ounce glasses of water. You may have black coffee, tea without milk, colas, ginger ale, or other similar "clear" liquids. Unless otherwise directed, you should take your usual morning medicines. You should bring all your medicines with you to the hospital.
WHERE DO I COME TO FOR THE PROCEDURE?
You and your family should report to Radiology Registration on the 1st Floor of the hospital just off the East Wing elevators.

WHEN CAN I EXPECT TO KNOW THE RESULTS OF THE PROCEDURE?
The results of the procedure are usually back in approximately 2 weeks. However in some cases, the results may take longer. The doctor who ordered the test will call you and discuss the results with you.

If you have any questions regarding this procedure, please call 434-924-9401 and ask to speak with one of the nurse practitioners.