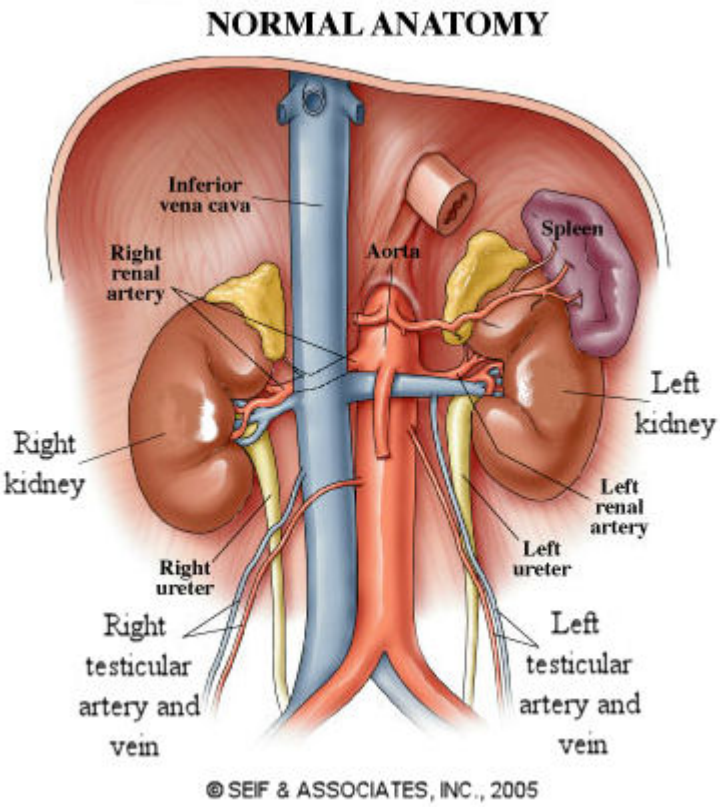
Renovascular Hypertension

Reno-vascular hypertension (RVHT) is the name for high blood pressure that is caused by a narrowing of the *arteries* (vessels) which carry blood to the kidneys. Renal is the name that applies to the kidneys. This is called secondary hypertension because it is caused by a known reason. Most high blood pressure is called essential because the cause is unknown. The onset of RVHT tends to occur in patients younger than 30 years or older than 50 years. It is most common in younger women and older men. Younger women develop RVHT most often from fibro-muscular dysplasia affecting the renal arteries where they are closest to the kidneys. High blood pressure along with atherosclerotic renal artery disease and poorly working kidneys is a very strong predictor of increased death rates. RVHT is less common among the black population than the white population. Older men develop RVHT most often from atherosclerotic disease. This means there is a hardening of the arteries which decreases blood flow to the kidneys.



CAUSES

In high blood pressure caused by the kidneys, one or both of the renal arteries become narrow. This reduces blood flow to the kidneys. When this happens the kidneys think the blood pressure is low. They kidneys play a large part in regulating blood pressure. So when the kidneys think the BP is low, they secrete hormones (a protein called renin) that tell the body to keep in salt and water rather than passing it out in the urine. This causes an increase in blood pressure.

There are numerous conditions that block the renal artery. Some of these are:

- Atherosclerosis is a hardening of the renal arteries and plaque buildups cause the blockage.
- Fibromuscular dysplasia is a condition in which cells of the artery wall overgrow causing narrowing.
- Narrowing can also be caused by blockage due to injury, tumors, or blood clots.

SYMPTOMS

The main problem caused is high blood pressure. Your blood pressure is recorded in two values. The top number is the systolic which is taken when the heart contracts. Normal is generally under 130. The bottom number is the diastolic blood pressure. This is the pressure in blood vessels when the heart is at rest. It should be below 90. In people with renovascular hypertension, it may be much higher. Because high blood pressure early in the course causes no symptoms, the problem is often discovered on a routine exam or check of the blood pressure. Infrequently, you may have mild headaches. Once the problems become severe if it is discovered in late stages there may be signs of malignant hypertension. This requires immediate treatment. Signs of severe blood pressure elevations may include:

- Fatigue.
- Anxiety.
- Perspiration.
- Abdominal pain.
- Irregular heartbeat.
- Nausea and vomiting.
- Visual problems.
- Redness of the skin.
- Blood in urine.
- Noise in the ears.
- Confusion.
- Chest pain.
- Heart failure.
- Nosebleed.

Reno-vascular hypertension is often very high and difficult to treat but many people will have no symptoms. If it is caused by a blood clot in a renal artery, the patient will usually have a sudden pain in the side and bloody urine. Many serious complications, including heart disease, heart attack, heart failure, stroke, blindness, and kidney failure may happen.

DIAGNOSIS

Your caregiver may be able suspect this on exam. They may hear a sound called a bruit. This is the noise blood makes when it is going through a narrowed place in the renal artery. Some of the tests that are useful include:

- Blood work to look at different hormone levels.
- Ultrasound, which uses sound waves to produce an image of the kidneys.
- Renal angiography, in which a dye is injected into the renal artery to show narrowing of the artery on x-ray.
- Intravenous urography, in which a dye is injected into a vein then filtered by the kidneys. Then x-rays are taken of the kidneys.
- Tests can also be done to measure renin levels.
- A "whooshing" noise, or bruit, which may be heard by your caregiver when listening with a stethoscope over the *abdominal* (belly) or flank area.
- Heart failure may develop and found by your caregiver.
- Kidney failure which progresses rapidly is a sign your caregiver may find.
- Acute renal failure which occurs when starting ACE-I or ARB type medicines.
- Sudden high blood pressure worsening in an elderly person with previously well controlled BP.

TESTS WHICH HELP CONFIRM THE DIAGNOSIS

Elevated blood pressure measurements, repeated over time, confirm hypertension.
Signs of rapidly developing complications may occur. Some of these are:

- Enlargement of the left *ventricle* (the large chamber of the heart)
- Hypertensive retinopathy (vessel damage in the eyes)
- Presence of a bruit (like a murmur heard in the belly)

Visualization methods to see artery narrowing (atherosclerosis or renal stenosis) include:

- Renal arteriography (injection of dye into the renal artery so that a narrowing of the artery can be seen on an x-ray).
- Doppler ultrasound of the renal arteries.
- Magnetic Resonance Angiography (MRA).
- Angiotensin converting enzyme (ACE) inhibition renography.
- Blood tests may also be performed to check renin and aldosterone levels.

TREATMENT

- Your caregiver will provide you with medicines that will help. **Good blood pressure control is necessary**. Blood pressure control is sometimes associated with decreased blood flow to the kidneys. When this happens, the kidney function may get worse in spite of the good control.
- Treatment of any condition causing the high blood pressure is necessary. This means lowering your cholesterol, eating a heart healthy diet, exercising, and maintaining an ideal body weight. Control your *sodium* (salt) intake. This can have a may have a good effect in lowering your blood pressure. Salt, MSG, and baking soda all contain sodium. All processed meats are very high in sodium.
- **Stopping smoking is absolutely necessary.** Alcohol should also be used very little or in moderation. Your caregiver can instruct you on this.
- Surgery to relieve the blockage may be necessary when a renal artery is blocked badly.

- Another procedure called percutaneous transluminal angioplasty (PTRA) can open narrow renal arteries if they are not completely blocked. Return of the problem after this procedure is usually less than 25 percent. Stents placed during angioplasty may be helpful in the prevention of a repeat blockage. Patients with artery disease in both kidneys present treatment challenges. Treatment for a patient with this finding should be discussed with your surgeon or other caregivers.

COMPLICATIONS

- Early death
- Congestive heart failure
- Kidney failure
- Hypertensive heart disease
- Blood vessel damage
- Stroke
- Heart attack
- Kidney damage
- Blindness

SEEK IMMEDIATE MEDICAL CARE IF YOU:

- Develop shortness of breath.
- Develop visual changes (the way you are seeing things).
- Develop numbness on one side.
- Develop an inability to speak.
- Develop areas of muscle weakness.
- Develop chest pain, feel light headed or pass out.
- Have sudden elevations of blood pressure. You should have a blood pressure cuff and monitor this on a daily basis. Let your caregiver know about sudden elevations in blood pressure.

Summary: High blood pressure caused by a blockage of blood to your kidneys is a serious problem and requires immediate treatment. Your caregiver will discuss your options with you and discuss any information in this handout that you do not understand.

Document Released: 12/01/2006 Document Re-Released: 03/16/2010
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