

## FACT SHEET

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### **Blocked Kidney Artery Causes High Blood Pressure and Kidney Failure** ***Interventional Radiologists Diagnose and Treat This Silent Cause of End-stage Renal Disease***

Hypertension, or high blood pressure, affects an estimated 10-25 percent of the population of the United States. Most people can be treated with medication, but a subset of this group—3 to 8 percent—have hypertension that is caused by vascular disease, i.e., arterial blockage or narrowing in the renal artery.<sup>1,2</sup> This renovascular disease causes decreased blood flow to the kidney, which results in systemic (body-wide) constriction of the blood vessels, causing a rise in blood pressure. This hypertension in the renal blood vessels may occur while the systemic blood pressure remains normal, making it difficult to detect.

#### **Renal Hypertension—A Major Cause of End-stage Renal Disease**

Renal hypertension puts stress and increased pressure on the kidney, and is a major cause of end-stage renal disease, also known as chronic renal disease, in the elderly. Vascular disease, also known as atherosclerosis, is prevalent in the United States, and as the population ages, the number of people with vascular disease will increase. So too will the number with renovascular hypertension and end-stage renal disease. People with end-stage renal disease require dialysis or kidney transplantation.<sup>4</sup>

Renovascular hypertension should be suspected when the onset of hypertension occurs before age 30 or after age 50, or when stable hypertension becomes more difficult to control with medication. White males and blacks of both sexes are at higher risk and people over 50 are at higher risk.

#### **Diagnosis and Treatment**

With imaging studies and biochemical work-up, interventional radiologists can accurately diagnose renovascular disease. If medical management—medications and lifestyle changes—are insufficient, interventional radiologists can perform angioplasty and, if needed, stenting, to improve blood flow to the kidney. The goal of the treatment in renovascular disease is normalization of the blood pressure or improvement of its control with medications, and improvement or preservation of kidney function. Angioplasty of the renal artery is relatively low risk and can greatly improve blood pressure control and thus prevent further damage to the kidney. Balloon angioplasty and stenting has generally replaced surgery as the first-line treatment for renal arterial occlusions.<sup>9</sup>

## **Complications of Renovascular Hypertension**

- Early death
- Hypertensive heart disease
- Myocardial infarction
- Congestive heart failure
- Renal insufficiency or failure
- Stroke
- Retinopathy, i.e., damage to the eyes from high blood pressure

## **Treatment of Renal Failure**

Interventional radiologists also play a role in treating patients with renal failure. In these patients, revascularization with angioplasty has gained acceptance as a treatment to improve or stabilize renal function, with improvement seen in approximately 40 percent of patients. Use of this treatment will probably increase as awareness of the benefits and relatively low risk of angioplasty become more widely understood in the medical community.<sup>3</sup>

## **Preserving Hemodialysis Access for Patients Requiring Dialysis**

Patients with chronic renal failure need regular hemodialysis that performs the kidney's job of ridding the body of toxic waste products, and to maintain fluid, electrolyte and acid-base balance.<sup>4</sup> One of the greatest challenges facing patients and their doctors is keeping the vascular access graft open for dialysis. Most patients with chronic renal failure receive dialysis using synthetic bridge grafts made of polytetrafluoroethylene (PTFE). These tend to clot or malfunction, decreasing reliable access for life-sustaining dialysis and causing considerable morbidity, discomfort and inconvenience for dialysis patients.<sup>7</sup>

Currently, there are about 250,000 Medicare patients undergoing hemodialysis in the United States, and half or more will have at least one episode of clotting (thrombosis) of the graft.<sup>7,8</sup> Until recently, most thrombosed grafts had been managed by surgically removing the clot, but interventional radiologists are increasingly providing nonsurgical dialysis declotting. These interventions are safer, less costly, and equally effective and they improve the quality of life for dialysis patients.<sup>8</sup>

Interventional techniques to break up the clot include:

- Angioplasty
- Stenting
- Combination of drugs and mechanical devices to break up the clot, i.e., a pulse spray with a clot-dissolving drug (lytic agent)
- Lyse and wait thrombolysis (drug therapy alone)
- Balloon thrombectomy (clot removal) techniques
- Use of mechanical thrombectomy devices

The success of the interventional technique is dependent on removing the lesion that caused the blood clot/arterial plug.<sup>8</sup>

Because of the clotting issues with dialysis grafts, a growing number of patients are having an arteriovenous fistula, which is a connection created surgically by joining a vein and an artery in the forearm that allows blood from the artery to flow into the vein, thus providing access for dialysis. Fistulas are considered the “gold standard” for maintaining access to a patient’s circulatory system, to provide life-sustaining dialysis. They last longer, need less rework, and are associated with lower rates of infections, hospitalization and death than other types of access.<sup>7</sup>

## **About Interventional Radiologists**

Interventional radiologists are doctors who specialize in minimally invasive, targeted treatments that have less risk, less pain and less recovery time compared to open surgery. They use their expertise in interpreting X-rays, ultrasound, MRI and other diagnostic imaging studies to understand, visualize and diagnose the full scope of the disease’s pathology and to map out the procedure tailored to the individual patient. Then during the procedure, they image as they go to guide tiny instruments, such as catheters, through blood vessels or skin, to treat diseases at the site of the illness nonsurgically.

Interventional radiology is a recognized medical specialty by the American Board of Medical Specialties. Interventional radiologists complete preliminary training in Diagnostic Radiology and advanced training in Vascular and Interventional Radiology. The American Board of Radiology certifies their specialized training.

## **For Further Information**

For more information on hypertension or interventional radiology, visit the SIR Web site at [www.SIRweb.org](http://www.SIRweb.org).

## **References**

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