

## Hypertension

Hypertension (high blood pressure) is one of the most common medical conditions in the U.S. In those people with chronic kidney disease, it is even more common and a special relationship exists in which hypertension causes kidney damage and, conversely, kidney disease can cause hypertension.

Hypertension usually does not cause symptoms and can be present for many years before leading to the common complications of kidney disease, heart attacks, congestive heart failure, and stroke. That is why it is important to monitor blood pressure regularly.

Diseased kidneys can lead to hypertension for several reasons. It is clear that, for example, excess body salt and water, often seen in kidney disease, can expand blood vessel volume and lead to hypertension. In addition, the kidneys secrete a hormone, renin, which ultimately leads to the formation of another hormone, angiotensinII, which constricts blood vessels and also leads to hypertension. Anti-hypertension medications have been specifically designed to address these mechanisms as well as others. The major classes are briefly outlined below.

Diuretics—cause salt and water loss, which can improve symptoms of fluid retention while also controlling blood pressure. The side effects can be dehydration and low body potassium

ACE inhibitors—angiotensin converting enzyme inhibitors; these medications interfere with the body's ability to make the blood pressure raising hormone angiotensin II

ARBs—angiotensin receptor blockers; block the body's blood vessel receptors for this hormone

CCBs—calcium channel blockers; block the entry of calcium into blood vessel smooth muscle cells, thereby causing blood vessel relaxation and lowering of blood pressure

Beta blockers—block the heart's response to excitatory signals, thereby lowering heart rate and blood pressure

In the general population, several life style changes have been shown to lower blood pressure. These include:

- Weight loss in those who are overweight or obese
- Dietary salt restriction
- Lowering of alcohol consumption in those who average more than 2 drinks/day
- Exercise

Our group has a strong interest in managing hypertension in our patient population. With each set of new guidelines proposed by the Joint National Committee on the Prevention, Detection, Evaluation and Treatment of High Blood Pressure the target blood pressures have been lowered in accordance with the observation that cardiovascular complications are strongly impacted by the degree of blood pressure control. This is particularly true with kidney disease. It has been known for many years that uncontrolled hypertension can hasten deterioration of kidney function and the target blood pressure for our patients is now generally  $< 130/80$ . Unfortunately, this often requires several medications (3 or more) in addition to the lifestyle modifications mentioned above. Fortunately, these medications are generally available, safe and well tolerated when used carefully and appropriately. Home blood pressure monitoring and 24 hour ambulatory blood pressure monitoring are often helpful tools in blood pressure management. We routinely use such techniques in our efforts to achieve and maintain good blood pressure control.

With our electronic database we will also have the ability to track blood pressure information in our entire patient population. This will enable us to better understand how effective our efforts have been, to specifically look at those who are not optimally controlled, and to get a better understanding of which medications and at what doses are most useful in controlling this difficult problem.