

pounds per 48 hours is not exceeded. Adherence to a 2 gram per day sodium diet will greatly ease excessive thirst.

Strict adherence to the prescribed schedule for the administration of blood pressure control medications (antihypertensives) is an equally important adjunct to the control of hypertension. A helpful strategy to assess the adequacy of blood pressure control between the dialysis session is to monitor it at home. Typically, blood pressures obtained in the dialysis unit are higher than the values measured at home. The role of contributory factors, such as anxiety in the dialysis unit or withholding antihypertensive medications before dialysis, can be eliminated by checking the blood pressure at home. These values obtained at home provide your physician with more accurate blood pressure determinations in a realistic setting that is representative of most of your time.

In the hypertensive patient with a well functioning kidney transplant, salt and water restriction, with or without the use of antihypertensives, may be used. Hypertension in transplant patients which is secondary to cyclosporin toxicity or to steroid side-effects may be treated by reducing the doses of these medications.

blood pressure control include weight loss in patients who are overweight and the institution of an exercise regimen for sedentary patients.

For patients with more severe hypertension which is unresponsive to these initial maneuvers, or for patients with kidney disease not yet on dialysis, medications which reduce the blood level of renin (such as captopril, enalapril, and lisinopril), relax the blood vessels (such as hydralazine, clonidine, minoxidil, methyldopa, and nifedipine), or decrease the force with which blood is pumped from the heart (such as propranolol, atenolol, and labetalol) may be used alone or in combination. Once renal failure requiring dialysis is necessary, approximately 75% of the previously hypertensive patients can have their blood pressure controlled by the aggressive removal of fluid with dialysis. Thus, for the patient on dialysis, the amount of fluid in the body is a critical determinant of blood pressure.

A frequent complaint of dialysis patients is that “too much fluid is [being] removed.” This perception relates to the imprecision of the patient’s sense of well-being as an indicator of the appropriate fluid status. Most patients feel less well when fluid is removed at dialysis, especially when large amounts are removed in a short interval of time. Further, many dialysis patients feel improved when their blood pressure is moderately elevated. However, the chronic consequences of inadequate fluid removal at hemodialysis are grave. They are the same severe and often irreversible injuries to the heart (congestive heart failure, heart attacks), brain (strokes), blood vessels (swollen legs, leg cramps, poor circulation), and eyes (loss of vision) that occur in untreated essential hypertension.

The determination of the appropriate amount of fluid to be removed at dialysis is imprecise. This is because the estimated dry weight (EDW), which is the optimal weight for a normal blood pressure with no fluid excesses, is not static. For example, if the patient has been ill and eating poorly, the amount of solid weight (muscle, fat, and bone) will decrease, and the EDW must fall as well. If the EDW is not appropriately decreased, the additional weight is composed of fluid, which has deleterious consequences. You can facilitate your sense of well being at dialysis, and your blood pressure control between dialysis session, by limiting the intake of fluids such that a weight gain of 2 – 4

A second factor which contributes to the elevation of blood pressure is that diseased kidneys release a hormone which indirectly causes the kidneys to retain salt and water, and causes the blood vessels to narrow. This hormone, which is called renin, may also contribute to the progression of kidney failure. Therefore, reducing the effects of renin are the target of many

Newer medications used to treat high blood pressure in kidney disease. For the patient with a kidney transplant, an additional factor which contributes to the development of hypertension is the use of steroids, such as prednisone, to prevent transplant rejection. This group of medications causes the inappropriate retention of salt and water. Less commonly, hypertension may develop in a transplant patient because of too great a dose of cyclosporine A, which constrict the blood vessels, or because the blood flow to the transplant is blocked. In any form of hypertension, environmental stresses and anxiety augment the increase in blood pressure.

The clinical presentation of hypertension is highly varied. Essential hypertension is typically a disease of middle age, but the presentation in blacks is often at an earlier age than in whites. Most patients with essential hypertension have no symptoms until the heart, kidneys, eyes, blood vessels, or brain have been damaged. In its most extreme presentation, hypertension is associated with heart failure, kidney failure, visual impairment, and (or) confusion, strokes, and seizures. Because of its fatal course if the patient is not treated immediately, this presentation for high blood pressure is described as malignant hypertension. Most patients with malignant hypertension have a background medical history of underlying kidney disease or hypertension which is inadequately treated. It is also more common in blacks than whites.

How is hypertension treated? Therapy for hypertension is directed at the cause. For example, in those patients who have a adrenal tumor or inadequate blood flow to the kidneys as the cause of their hypertension, the treatment is to remove the tumor or to restore normal kidney blood flow, respectively. For the majority of patients with essential hypertension and normal kidney function, blood pressure control is initially directed at limiting the dietary intake of salt, with or without the use of diuretics (“fluid pills”) to accelerate the excretion of salt and fluids in the urine. Additional strategies for

HYPERTENSION

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What is hypertension? Hypertension, or high blood pressure, is defined as an elevation in either the systolic or (and) diastolic blood pressure. The systolic blood pressure, which is the higher number reported for your blood pressure, and the diastolic blood pressure, which is the lower number, are normally a function of the force with which blood is pumped from the heart and the resistance in the blood vessels to its forward flow. The numerical definition of hypertension is influenced by the individual's weight, sex and age. However, for adults it is generally accepted that a blood pressure of greater than 150/90 is excessive and fulfills the definition of hypertension. Interestingly, elevation of the diastolic blood pressure is the value which is most often associated with the long term complications of heart failure, heart attacks, poor circulation, strokes, and eye disease.

What are the causes of hypertension? In adults, hypertension is usually without a well-defined, and therefore reversible etiology. Uncommon diseases, such as hormone producing tumors in the adrenal gland or constriction of blood flow to one or both arteries of the kidney, are treatable causes of hypertension. However, in most cases of hypertension, no such abnormalities are found. These individuals are described as having "essential" hypertension. Obviously, this description is a misnomer. Although there is a genetic predisposition to hypertension, hypertension is not a constitutive or essential disorder.

Vigorous research to define the causal factors in essential hypertension have suggested two general abnormalities which are particularly relevant to the patient with hypertension and kidney disease. The first of these factors is the amount of fluid contained within the body. In the patient with kidney insufficiency, the capacity of the kidneys to excrete the daily dietary load of salt and water is compromised. These fluids accumulate in the body, including the blood vessels. Like a garden hose which is turned on, but is knotted and therefore the water entering it cannot escape, the pressure inside increases.