PART ONE

The Blood Pressure Problem

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Hypertension: The Silent Killer

Blood pressure is sort of like the weather. Everyone talks about it, but not enough people do anything about it. It's often called the silent killer because, for the most part, it has no symptoms. Headaches associated with blood pressure are relatively rare. We see hypertension mentioned over and over again as one of the main risk factors for heart attack and stroke. Every time we visit a doctor's office, we get our blood pressure tested. But the sad fact is that while literally millions of men and women have blood pressure levels that put them at risk, most of them don't get their numbers under control.

I think there are two reasons for this. First, most of us don't understand blood pressure well enough to appreciate its importance. Second, many people aren't willing to take drugs that carry a heavy load of side effects or they don't want to make what they think will be major lifestyle sacrifices to eliminate a risk factor that doesn't appear to really bother them. In this book, you'll learn everything you need to know about blood pressure and you'll be delighted to find out that most people who have mild to moderate blood pressure elevations don't have to take prescription drugs or make major changes in their lives.

You already know more about blood pressure than you realize. That's because you're very familiar with the plumbing in your own

house. One of life's great pleasures is taking a shower with water gushing powerfully over your body. That comes from having sufficient water pressure in your bathroom pipes. You also need good water pressure to wash the dishes, water the lawn, and wash the car. Conversely, we all know the frustration of having low water pressure. We might even have to call the plumber if the pressure falls too low. He'll use a little device to measure the pressure at different points in the house and the yard and make suggestions as to how you can improve the situation. Maybe mineral deposits have clogged the plumbing. Once the problem or problems are fixed, you can have water pressure on demand.

That's pretty easy to understand, right? We can all relate to that scenario. Well, it's really not so different from the way blood pressure works. When we're young, our arteries—our internal pipes—are flexible and elastic and allow blood flow to be controlled without any problem. But as we age, and owing to other causes, our arteries stiffen and are unable to dilate and constrict adequately to provide our bodies with enough blood and oxygen. This explains 90 percent of cases of hypertension, medically referred to as primary hypertension. In African Americans, an increase in blood output when the heart's ventricle pumps also plays an important role, as does their greater sensitivity to salt and sodium. Going back to the water pipe analogy, the development of hypertension is a gradual process that we scarcely notice. Tragically, the first "symptom" might be a heart attack or a stroke. I've written this book to help to prevent such a tragic occurrence in your life.

So, enough about those water pipes. What about blood pressure? We'll start with the heart, which is essentially a marvelously designed chunk of muscle and chambers that pumps blood through an extensive network of arteries to every tissue in the body. Blood then returns to the heart through a parallel system of veins, where it collects in two chambers called the atria. Valves permit that blood to enter the other two chambers, the ventricles. Blood leaving the heart has been oxygenated by the lungs and brings that oxygen to our muscles and other tissues. When blood returns, it is reoxygenated and gathers in the atria. Then the heart's left

ventricle forcefully pumps oxygenated blood out through the aorta and on to the rest of the body's arteries.

Blood pressure is the force of our blood pushing against the walls of our arteries. As our hearts beat, typically 60 to 70 times a minute when we're sitting or lying down, blood is forced into and through the arteries. Blood pressure is highest when the heart beats, pumping that blood. That's the systolic pressure. Between beats, when the heart is at rest, blood pressure falls. That's the diastolic pressure. Blood pressure is expressed as the systolic pressure over the diastolic pressure, as in 120 over 80, written as 120/80. In the next chapter we'll go into detail about how blood pressure is tested and how those numbers are determined.

There are three known methods by which the body controls blood pressure. First are the pressure receptors in various organs that can detect changes in blood pressure and then adjust the pressure by altering both the force and the speed of the heart's contractions, as well as the total resistance to pressure. Second, the kidneys are responsible for the long-term adjustment of blood pressure through a system involving various chemical substances in the so-called renin-angiotensin system. Third, in response to high levels of either potassium or angiotensin, the steroid aldosterone is released from the adrenal glands, one of which is located on top of each kidney. This hormone then increases the excretion of potassium by the kidneys, while also increasing sodium retention in the body. For most of my readers, this information is far more than they need, but I provide it here for people with some medical background.

What happens, though, when the arteries, an essential part of our cardiovascular systems, fail to perform optimally? Let's say that a woman finds herself under heavy emotional stress. A man goes out in the winter to shovel snow that fell during the night. A fairly young guy decides to play in a pick-up game of basketball after too many years of a sedentary lifestyle. In all three cases, the heart beats faster to pump out more blood than usual, but the arteries aren't up to the task. They are unable to convey the necessary blood to the heart and the brain because they can't dilate enough to accommodate the larger-than-usual blood volume. Pressure increases on the

walls of the arteries, but the arteries just can't open up enough. In addition, plaque may rupture, spilling its contents into the bloodstream, which precipitates the formation of a large blood clot. The result is a heart attack or a stroke. The aftermath of a stroke can be devastating for people who survive. While heart attacks and strokes most typically involve a number of factors, extreme hypertension, medically termed *malignant*, can alone be responsible.

Okay, enough of the potentially tragic devastation of life. The good news is that most such heart attacks and strokes can be prevented by controlling, by "curing," the risk factors that cause them. The more we learn, the better the news gets. Based on data from the National Health and Nutrition Examination Survey in the United States, an ongoing decades-long evaluation, as many as three out of four cardiovascular events could be prevented by optimal control of blood pressure and cholesterol. That conclusion came from studying the data from 1,921 people ages thirty to seventy-four. Interestingly, this dramatic saving of lives could be accomplished from bringing blood pressure down to levels that most doctors still believe to be too high, no more than 140/90. This book will show you how to get those numbers down much lower, improving your odds even more.

As early as 1957, the Metropolitan Life Insurance Company published a chart showing that as blood pressure levels rose, life expectancy fell. Conversely, the lower the levels, the longer the life. And who doesn't want a long, healthy life?

For decades hypertension, or high blood pressure, has been recognized as one of the Big Three risk factors for cardiovascular disease, along with elevated cholesterol levels and cigarette smoking. With what we know today, though, diabetes should be added to the list of major risk factors—one of the Big Four. Of course, genes and family medical history play a huge role, but those genetic traits simply predispose you to problems down the road. Eliminate the risk factors that convert the potential to the real, and the question of family history becomes virtually moot. When I began preaching that mantra twenty years ago, many doctors said I was exaggerating, oversimplifying. Back in 1978, actuarial tables that predicted life

span indicated death within ten years for a man of thirty-five who had a family history of cardiovascular disease, had a long list of risk factors, and had suffered a heart attack and undergone bypass surgery. This means that I should have been dead by age forty-three, sooner rather than later. But I guess I fooled them! Today the vast majority of doctors and medical authorities agree that cardiovascular diseases, and deaths from heart attacks and strokes, are largely preventable. You simply have to make the decision, as I did, to eliminate the risk factors. As virtually any doctor will tell you, the risk posed by hypertension can be completely eliminated.

Here's a happy thought, something to inspire your commitment to good health in general and to blood pressure control in particular. Several—not just one or two—trials have demonstrated without doubt that reductions of systolic blood pressure by as little as one to three points will decrease your relative risk of stroke by as much as 20 to 30 percent. That's one heck of a return on your investment!

The following numbers speak for themselves, and I present them without commentary or fearmongering. Statistics from the American Heart Association in 2006 show that 65 million men and women in the United States have high blood pressure, defined as systolic pressure of 140 or greater and/or diastolic pressure of 90 or more. In the white population, 20.5 percent have hypertension, while that percentage jumps to 31.6 for African Americans. Nineteen percent of Hispanics and 16.1 percent of Asians have hypertension.

These rates of high blood pressure contribute significantly to the annual occurrences of 7.2 million heart attacks and 5.5 million strokes—pretty scary numbers. But there's a lot we can do to make sure we're not counted in those statistics.

Hypertension Risk Factors and What We Can Do about Them

Family history certainly plays a large role in determining whether you will develop hypertension, but I prefer to think of it merely as a warning. If the gate goes down and the lights go on at a railway

crossing, you've got a pretty good idea that a train is on its way. A wise person would never put himself or herself in harm's way by trying to race a car across the tracks. We don't tempt fate by indulging in reckless behavior. Just because your grandfather had hypertension and died from a stroke doesn't mean that you can't take steps to avoid repeating that history.

Race definitely comes into play. High blood pressure is far more common in blacks than in any other racial group, and it hits at an earlier age. But we know that African Americans are far more sodium sensitive than whites are and at the same time they have diets that are high in sodium, doubling the problem. The solution seems pretty obvious. Similarly, obesity and diabetes are more prevalent among blacks. Rather than wringing his or her hands in despair, the wise black individual will take appropriate action.

High blood pressure is more common in young and middle-aged men than in women of similar ages. In those age sixty and older, however, it is more common in women. Blood pressure testing, a simple and painless way to know if you're at risk, is available to everyone, regardless of sex.

You can certainly take control of the other risk factors involved in the gradual progression of elevated blood pressure and subsequent hypertension. Obesity plays a big part. The greater your body mass, the more blood is needed to supply oxygen and nutrients to your muscles and other tissues. Obesity increases the number and length of blood vessels, thereby increasing the resistance of blood that has to travel longer distances through those vessels. Increased resistance results in higher blood pressure. Fat cells themselves manufacture substances that adversely affect both the heart and the blood vessels.

Sedentary behavior boosts your risk by deconditioning the heart muscle just as much as it does other muscles in the body. Couch potatoes tend to have higher heart rates because their heart muscles aren't as efficient and have to work harder to pump blood. Moreover, physical activity is a vasodilator; that is to say, exercise of any sort dilates blood vessels. Combining inactivity with being overweight multiplies the problem.

Sodium and salt intake remain controversial as risk factors for hypertension. While it's true that some individuals are particularly sensitive to sodium, whether from the salt shaker or from sodium-based ingredients in processed and fast foods, not everyone responds to sodium equally. As we'll see, sodium is but one of many minerals, or electrolytes, that affect blood pressure. Increasing your intake of the others may be as important as, or more important than, decreasing your intake of sodium, other than for people who are proven to be sodium sensitive.

Alcohol definitely affects blood pressure, but this is a gray zone. Excessive alcohol consumption can raise blood pressure, whereas moderate drinking may actually help to keep it under control.

Stress is another highly controversial subject in the medical research community, although doctors in clinical practice regularly see the effects of stress in their patients. Stress boosts the production of harmful substances, increases the heart rate and blood requirements, and can over time raise blood pressure and precipitate a heart attack or a stroke. Again, there are many effective, proven methods to help you cope with stress.

Symptoms of High Blood Pressure

For the most part, hypertension is indeed a silent killer with no symptoms to tip you off that something might be wrong. An exception would be someone who experiences a dull headache, typically in the back of the head and usually in the morning. Bear in mind that such headaches are the rare exception rather than the rule.

Ordinary headaches, dizziness, and nosebleeds are not symptoms, at least in the early stages of blood pressure elevation. Those symptoms can occur, however, with severe hypertension. That said, even people with very high blood pressure normally don't have any symptoms.

Because blood pressure is influenced by a waterfall sequence of chemical substances in the kidneys, and because severely high blood pressure can damage the kidneys, certain symptoms may occur in advanced disease states that are not directly caused by

blood pressure but rather are due to the damaged kidneys. These include excessive perspiration, muscle cramps, weakness, frequent urination, and a rapid or irregular heartbeat.

Blood Pressure Classification

There has been considerable worldwide discussion, if not controversy, over the classification of increasing levels of blood pressure. That was precipitated in 2003 by the Joint National Committee (JNC) on Blood Pressure and Hypertension, a branch of the National Institutes of Health in the United States. Its seventh set of guidelines for classification and treatment (JNC7) created what future medical historians might ultimately view as a revolutionary landmark in addressing the vital importance of blood pressure control at virtually all levels. Critics, however, both within and outside of the United States, consider JNC7 to be inflammatory and unnecessary. I'll discuss the nuances and I'll let you judge for yourself, viewed from your vantage point as patient, physician, or both.

Following is the categorization of blood pressure and hypertension as defined by the JNC7 report and guidelines.

Category	*Systolic*	*Diastolic*
Optimal	115 or less	75 or less
Normal	Less than 120	Less than 80
Prehypertension	120 to 139	80 to 89
Stage 1 hypertension	140 to 159	90 to 99
Stage 2 hypertension	More than 160	More than 100

If either the systolic (upper) or the diastolic (lower) number is in one of the three categories above normal, overall the patient is considered to be in that category.

"Why the big deal? What's the difference?" you might well ask. As I'll detail shortly, the risk of cardiovascular disease, heart attack, stroke, and death rises linearly with blood pressure. Anything more than 120/80 begins to increase the risk, especially when other risk factors are concurrently present, such as elevated cholesterol, cig-

arette smoking, and especially diabetes. The data are compelling. As you read through them, you'll no doubt prefer to be at the low end of the risk spectrum. Doctors have sometimes been accused of not being aggressive enough in confronting and battling disease, especially degenerative disease that takes a long time to develop. Not anymore!

The biggest point of dissension was the introduction of the term *prehypertension*. With some justification, critics feared that labeling patients as having "prehypertension" rather than "high normal" blood pressure would make them fearful. Some people were concerned that such a label on a medical record might influence medical insurance rates. Others worried that antihypertensive drugs might be prescribed excessively, even though the JNC7 guidelines call for lifestyle modifications before prescribing drugs.

When I first read the JNC7 guidelines, I sided with the critics. But the more I thought about it, the more I agreed that stricter guidelines were better. Interestingly, I had adamantly criticized U.S. cholesterol guidelines for years, complaining to my readers that it was ridiculous to have two sets of guidelines, one for people without cardiovascular disease and another for those who had had a confirmed diagnosis or who had suffered a cardiovascular event of one sort or another. Wouldn't it be better to recommend that everyone get his or her low-density lipoprotein (LDL) as low as possible and high-density lipoprotein (HDL) as high as possible to *prevent* development of the disease or suffering an event rather than waiting for that to happen?

So it is with blood pressure. The lower we can get our numbers, the better off we are now and will be in the future. It really doesn't matter whose chart you're looking at, in Australia, the United States, or elsewhere in the world. All cardiologists and medical authorities agree that your goal should be 120/80 or, even better, down as low as 115/75 or lower.

For many years, doctors believed that diastolic blood pressure, the lower number, was the more important evaluation. Today we know that the opposite is true. Elevations of systolic blood pressure, the top number, are far more predictive of cardiovascular disease

that can lead to a heart attack or a stroke. Japanese research published in the journal *Hypertension* in November 2006 documented that elevations in systolic blood pressure are the most predictive of a stroke. According to current hypertension management guidelines, a 5-point reduction in systolic blood pressure can reduce mortality substantially and cut the risk of having a stroke by 14 percent and of getting heart disease by 9 percent. Perversely, systolic blood pressure is far more difficult to lower effectively than diastolic blood pressure. The program components of *The Blood Pressure Cure* have been clinically documented to significantly reduce systolic pressure and therefore your risk of having a heart attack or a stroke.

Pulse pressure is another important consideration for you and your physician. Pulse pressure is essentially the difference between the systolic and diastolic pressure readings. Dr. John Cockcroft, an international authority on blood pressure and hypertension at the University of Wales College of Medicine in the United Kingdom, provided a dramatic example of this in an interview featured on *Medscape Cardiology*, an Internet service for cardiologists and others specializing in heart health. He explained that if you look at the risk of a cardiovascular event such as a heart attack or a stroke in people with a rise of about 20 mm Hg in systolic blood pressure, the risk is not as great as that from a 20 mm Hg rise in pulse pressure. Dr. Cockcroft said that pulse pressure is often a far better predictor of risk than either systolic or diastolic blood pressure alone.

But that doesn't mean you or I should turn into neurotics about our blood pressure levels, which the critics fear might happen. Life is to be lived and enjoyed. Happily, a lot of the things we can do to benefit our blood pressure will make our lives even longer and more enjoyable!

The Rationale for Lower Blood Pressure

The data indicating that the higher the blood pressure, even within limits previously considered completely normal or high-normal, the greater the risk of cardiovascular disease, stroke, heart attack,

and death have been building up for several years. These data have reached critical mass, and now virtually all physicians and medical authorities agree that the lower a person can bring his or her blood pressure into an optimal zone of about 115/75 or even less, the better. It now appears that, especially for people over fifty, the systolic (top) number is most important. Even if the diastolic (bottom) number is quite normal, attention should be paid to getting the systolic pressure down. There is a condition termed *isolated systolic hypertension*, in which diastolic pressure is relatively normal but systolic pressure is elevated. Doctors treat that condition aggressively.

In a study at the University of North Carolina involving about nine thousand men and women over a period of 11.6 years, the rate of cardiovascular disease increased significantly as blood pressure levels increased. Compared with patients who had optimal blood pressure levels, those with high-normal measurements had two and a half times the risk of developing cardiovascular disease. That statistic took into consideration other factors involved in the disease. Most of the risk was in the form of a stroke. The risk was greatest for African Americans, diabetics, overweight and obese individuals, and people with high levels of LDL cholesterol.

Researchers concluded that the "prehypertension population is large," and that efforts to lower blood pressure to optimal levels "have the potential to make a significant impact."

Subsequent investigations have proved that to be absolutely true. In a recently published study, nearly nine thousand middle-aged adults with blood pressure levels previously considered to be normal or high normal were broken into three groups and tracked for an average of twelve years. Blood pressure levels in the three groups were: (1) lower than 120/80, (2) 120–129/80–84, and (3) 130–139/85–89. Compared with the group that had the lowest blood pressure, the second and third groups had 70 percent and 144 percent greater risk, respectively, for coronary heart disease.

Moreover, high-normal blood pressure often quickly progresses to frank hypertension within a period of four years or less. The older one is, the greater that risk. In a study at Boston University, nearly half of all adults sixty-five or older who had high-normal

blood pressure went on to develop hypertension during that time. And the likelihood of developing hypertension was increased an additional 20 to 30 percent for those who gained an additional 5 percent of body weight. Results were similar in both men and women. Researchers concluded that high-normal blood pressure is more similar to hypertension than it is to normal blood pressure. In other words, there is a continuum.

Here's another sobering statistic from the U.S. JNC7 report. The higher the blood pressure, the greater the risk. For individuals forty to seventy years of age, each increment of 20 mm Hg in systolic blood pressure or 10 mm Hg in diastolic blood pressure *doubles* the risk of cardiovascular disease across the entire blood pressure range from 115/75 to 185/115 mm Hg. Let's put that into some specifics. Let's say your systolic blood pressure increases from 115 to 135 over a period of time. Your risk has been doubled. Over the coming years, if the systolic pressure goes up by another 20 mm Hg to 155, your risk is doubled again. It's a very slippery slope! But the good news is that the opposite also applies. There is a continuous benefit as blood pressure goes down closer and gets closer to that optimal level of 115/75. That should be everyone's target, the holy grail of heart health.

We already know the benefits that can be derived from lowering levels of what is now called prehypertension to more optimal counts. Results of the study known as TROPHY (TRial Of Preventing Hypertension) were presented at the March 2006 meeting of the American College of Cardiology (ACC). The mean age of patients with prehypertension was 48.5 years; half were treated and the other half were not. At the end of the two-year trial, treatment was shown to reduce the risk of progression to hypertension by 66 percent.

In the TROPHY study, treated patients received the antihypertensive drug candesartan. But success can be achieved by lifestyle changes alone, as proved by a project funded by the National Heart, Lung, and Blood Institute of Health. Lifestyle changes that protected the subjects in that study from progressing from prehypertension to hypertension included weight loss, physical activity,

moderation of alcohol consumption, and a diet rich in fruits, vegetables, and whole-grain cereals. In fact, an editorial accompanying the report published in the *New England Journal of Medicine* questioned the use of potent pharmacological agents and suggested aggressive lifestyle modification as the superior approach. And that doesn't even take into consideration the use of newly developed, natural supplements clinically documented to lower blood pressure. I discuss those secret weapons later in this book.

International readers might well comment, "Okay, that's the American point of view. But it doesn't necessarily apply to us in other countries." Sorry, but that's just not true. It would get boring, but I could cite study after study from countries around the world, including the United Kingdom, Sweden, Italy, Germany, Finland, and Australia, coming to the same inevitable conclusion: if you want to protect yourself from cardiovascular disease, stroke, heart attack, heart failure, and kidney disease, get your blood pressure down to that optimal 115/75 level or at least as close as possible. That's especially true for people with other risk factors, including elevated cholesterol levels, a family history of cardiovascular disease and premature death, cigarette smoking, diabetes, overweight, a sedentary lifestyle, and unmanaged stress and emotional distress.