

# Chapter 1

## Introducing High Blood Pressure

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### *In This Chapter*

- ▶ Moving the blood through the cardiovascular system
  - ▶ Defining what determines high blood pressure and its consequences
  - ▶ Preventing high blood pressure and examining treatment options
  - ▶ Treating hypertension in special populations
  - ▶ Investigating up-to-date information
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**I**f you have high blood pressure, you're in good (though not terribly healthy) company. Sixty-five million Americans (one in three adults) have high blood pressure. A list of the people in this country with high blood pressure would read like a *Who's Who*. The problem is that, without proper treatment, many of those people will be on a list of *Who Was Who* sooner than they expect. The reason is that high blood pressure is the largest risk factor for heart attacks, brain attacks (strokes), and disease of the arteries. Don't let yourself or a loved one get on that second list without a fight!

You can do so much about high blood pressure — you can prevent it, and if it's already high, you can control it. But before you act, you need to know what high blood pressure is and how you measure it. You also need up-to-date information about its causes and its treatments. This book is your blood pressure companion, providing you with a solid understanding of your blood pressure: how it affects your body organ by organ, who is at risk, how you can prevent it, and how you can treat it after it's properly diagnosed.

As you'll discover, a few simple alterations to your lifestyle can prevent high blood pressure. My hope is that as you read this book, you're spurred on to make these changes, not just now but in the future. High blood pressure is a chronic disease. You may lower your blood pressure in the short term, but the goal is long-term control to prevent other medical consequences (see Part II).

Take charge of your blood pressure now so you don't suffer the fate of a health-food storeowner who posted a sign saying, "Closed due to illness."

## Understanding Your Cardiovascular System

To understand how elevated blood pressure affects your overall health, you need to understand the contribution of your heart and blood vessels. Your cardiovascular system — your heart, arteries, veins, capillaries, and the blood that fills them — nourishes your body and connects each part to every other part. The cardiovascular system carries

- ✓ **Food** (carbohydrates, protein, fat, vitamins, and minerals) from the gastrointestinal tract to every organ in the body
- ✓ **Oxygen** from the lungs and in the blood to distant organs
- ✓ **Waste**, a normal product of your body's metabolism

For example, the cardiovascular system carries carbon dioxide to the lungs and the other waste products to the liver and kidneys.



Pressure must exist to push the blood through the cardiovascular system. (Otherwise your blood would pool in your legs due to gravity when you stood up!) Just as your household water supply reaches a faucet because of pressure pushing it through the pipes, blood reaches your brain because pressure is allowing it to defy gravity and rise from the heart.

The heart muscle (the source of this pressure) squeezes out the blood forcefully so the blood not only defies gravity but also travels through the smallest passageways (the capillaries).

When essential body organs like the kidneys don't receive enough pressure to function properly, they signal the heart to pump harder. But what's good for the kidneys may not be good for the brain or the blood vessels themselves. And that's when the consequences of high blood pressure occur (see Part II).

## Measuring Your Pressure and Understanding the Measurement

When the nurse in your doctor's office measures your blood pressure, she puts the contraption with a cuff, a gauge, and some Velcro around your arm. She pumps the cuff up with air, listens with the stethoscope, turns a screw to release the air pressure, and then writes down a couple of numbers in your chart. Then your doctor enters and says those numbers are "good" or "not so good."

What's that contraption? What's the meaning of those numbers? Why do they seem to have such a profound effect on your life? Good questions. The contraption is a *sphygmomanometer*. When your doctor reads the numbers, say *135 over 85*, the first number is the *systolic blood pressure*, and the second number is the *diastolic blood pressure*. In Chapter 2, I discuss what these two pressures measure, what their numbers mean, and why the results have such a serious effect on your life.



One of the most effective steps you can take in understanding your health is to measure your own blood pressure with a home monitoring device. I cover this topic extensively in Chapter 2 as well.

## Looking at the Risk Factors for High Blood Pressure

Researchers have made tremendous efforts to understand the cause of high blood pressure and which populations are at risk of developing the disease. They know that numerous unalterable factors affect blood pressure (age, sex, ethnic background, and family history) and, to some extent, *how* these factors contribute to high blood pressure. But they still don't know which of these factors is the most important. I discuss risk factors in detail in Chapter 3.

Certain changeable factors (such as diet, exercise routine, and stress) can also place you at risk of developing high blood pressure. Ask yourself the following questions:

- ✓ Am I less active than I could be in my day-to-day routine?
- ✓ Am I overweight?
- ✓ Do I eat many salty foods?
- ✓ Do I have a stressful lifestyle?
- ✓ Do I smoke? Drink?



If you answer “Yes” to any one of these questions, then you're at risk of developing high blood pressure. The more questions that you answer in the affirmative, the greater your odds are for developing high blood pressure. But if you decrease the stress in your life and keep a rein on these changeable factors, you can decrease the possibility of developing high blood pressure. I discuss high blood pressure prevention further in Chapter 3.

Research indicates that high blood pressure arises in two stages:

- ✓ **A primary cause** such as the increased blood volume or constriction of the blood vessels: At this stage, high blood pressure is reversible.

- ✓ **A secondary result** such as the blood vessels permanently thickening: At this stage, high blood pressure becomes irreversible without the use of potent drugs.

Ninety-five percent of high blood pressure is categorized *essential high blood pressure* (but *primary high blood pressure* would be a better term); the cause is unknown. The remaining cases are *secondary high blood pressure*; a specific disease is identified as the cause. When that disease is treated, the blood pressure usually returns to normal. I discuss some causes of secondary high blood pressure in Chapter 4.

## *Focusing on the Consequences of High Blood Pressure*

If untreated, your high blood pressure can wreak havoc on your heart, kidneys, and brain.

- ✓ Heart attacks or heart failure may be the major consequence for your heart (see Chapter 5).
- ✓ Kidney failure may eliminate the filtering function of your kidneys (see Chapter 6).
- ✓ A brain attack (stroke) may destroy important brain tissue and the movements it controls in the body (see Chapter 7).



Deaths due to these conditions do occur, but the great majority of people who have serious conditions from high blood pressure suffer debilitating illness. Of those who survive a massive heart attack, kidney failure, or brain attack, many require the care of other people for the rest of their lives.

Most of this sickness and death due to high blood pressure is preventable, and Part III gives you all the tools you need to minimize those risks. The process may cost you time and resources, but the freedom from illness and the prospect of a longer life are well worth the effort.

## *Lowering High Blood Pressure with Different Treatments*

Treating high blood pressure (or preventing it entirely) involves all the tools I discuss in Part III. Get started with the following guidelines and check out Chapter 8 for an outline of a successful plan:

## Connecting cardiac output and peripheral resistance

An increase in blood *volume* (the amount of blood in the blood vessels) creates an increase in *cardiac output* (the amount of blood that the heart squeezes out with each heartbeat). For example, an increase in blood volume may result from salt intake, which then causes water retention. Because the body doesn't permit the cardiac output to remain elevated, it lowers the output by increasing the *peripheral resistance* (the blood vessels constrict, reducing the amount of blood flowing through the tissues). This rise in peripheral resistance leads to increased blood pressure.

A minor alteration in body chemistry may be enough to cause persistent high blood pressure. For example, a slight increase in *angiotensin II*

(a hormone produced when the kidney detects a low blood pressure) may cause thickening and narrowing of the blood vessels that leads to sustained high blood pressure. Other hormones, called *growth factors*, can lead to narrow arteries and increased peripheral resistance as well.

On the other hand, *nitric oxide* (a chemical made in the endothelial cells that line the inside of the blood vessels) is the most potent cause of *widening* blood vessels. If anything blocks the production of nitric oxide, the blood pressure rises. And because nitric oxide is reduced in *essential* (unknown causes) high blood pressure, this reduction may be an additional cause of increased peripheral resistance.

1. **Switch from a diet that promotes high blood pressure to a diet that lowers blood pressure** (see Chapters 9 and 10).
2. **Eliminate the poisons like tobacco, excessive alcohol, and some caffeine** (see Chapter 11).
3. **Add regular exercise** (see Chapter 12).



Just these three steps may be enough to lower your pressure to normal. If not, you have the option of adding one or more drugs (see Chapter 13). **Note:** Drugs aren't *substitutes*; they're *additions* to lifestyle changes.

## Protecting Children, Pregnant Women, and the Elderly

Special factors must be considered when evaluating and treating high blood pressure in children, pregnant women, and the elderly:

- ✓ The elderly (see Chapter 14) usually have other complicating diseases, are taking many other medications, and may have special dietary requirements.

- ✔ Children (see Chapter 15) are growing, maturing, and subject to the problems of relating to their peers; kids certainly don't want to be sick or even labeled as *sick*. Diagnosis and treatment of high blood pressure in children is challenging to say the least.
- ✔ Throughout pregnancy, a woman is making new hormones while her body undergoes major changes. The high blood pressure that occasionally develops as a direct complication of pregnancy can harm both a mother and her unborn baby (see Chapter 16).

## Staying Informed

The Part of Tens chapters in this book give you helpful tips on reducing your blood pressure and debunking blood pressure myths.

- ✔ In Chapter 17, you can find ten simple ways to prevent or reduce blood pressure. Individually, they each help to lower the pressure by a few millimeters of mercury. But taken together, they help you avoid the medical complications of high blood pressure. You can add them to your lifestyle one at a time or several at once — if you're up to it.
- ✔ In Chapter 18 I take on ten or so myths about high blood pressure and its treatment that are the most popular *and* the most detrimental to your health. (If you know of a myth that you think is damaging to many people with high blood pressure, by all means e-mail me at [highbloodpressure@drrubin.com](mailto:highbloodpressure@drrubin.com) and let me know.)
- ✔ As in all fields of medicine that affect large numbers of people, the research on high blood pressure is enormous and ongoing. Chapter 19 introduces some of the latest information that may save your life.

Finally, the book has a publication deadline date. Discoveries made after that date can't be in this edition (but will be in a future one). To keep up with future developments, the appendix provides the best places to look for new information. Some of that info is also on my Web site ([www.drrubin.com](http://www.drrubin.com)) or linked to it (click on the Web addresses in the *high blood pressure* section).

All this material comes to you at a bargain price. As the sign on the farmer's gate reads: "The farmer allows walkers to cross the field for free but the bull charges."