

This arresting article is largely based on interviews with three distinguished physicians: Dr. Irvine H. Page of the Cleveland Clinic; Dr. Donald Tapley of Columbia University's College of Physicians and Surgeons; and Dr. Irving S. Wright of Cornell University Medical College

I Am Joe's Heart

BY J. D. RATCLIFF

I'M CERTAINLY no beauty. I weigh 12 ounces, am red-brown in color, and have an unimpressive shape. I am the dedicated slave of—well, let's call him Joe. Joe is 45, ruggedly good-looking, has a pretty wife, three children and an excellent job. Joe has it made.

Me? I am Joe's heart.

I hang by ligaments in the center of his chest. I am about six inches long and, at my widest point, four inches across—more pear-shaped than Valentine. Whatever you may have heard about me from poets, I am really not a very romantic character. I am just a hardworking four-chambered pump—actually *two* pumps, one to move blood to the lungs, the other to push it out into the body. Every day, I would say, I pump blood through 60,000 miles of blood vessels. That's enough pumping to fill a 4000-gallon tank car.

When Joe thinks of me at all, he thinks of me as fragile and delicate. Delicate! When so far in his life I have pumped more than 300,000 *tons* of blood? I work twice as hard as the leg muscles of a dash runner, or the arm muscles of a heavyweight boxing champ. Let them try to go at my pace and they would turn to jelly in minutes. No muscles in the body are as strong as I am—except those of a woman's uterus as she expels a baby. But uterine muscles don't keep at it day and night for 70 years, as I am expected to do.

That, of course, is a slight exaggeration. I do rest—between beats. It takes about three tenths of a second for my big left ventricle to contract and push blood out into the body. Then I have a rest period of half a second. Also, while Joe sleeps, a large percentage of his capillaries are inactive; this means that I don't

have to push blood through them, and my beat slows from a normal 72 down to 55.

Joe almost never thinks of me—which is good. I don't want him to become one of those heart neurotics and worry us *both* into real trouble. When he does worry about me it is almost always about the wrong things. One night, as he was drifting off to sleep, Joe was listening to my quiet thumping—that's the opening and closing of my valves—and he thought he heard me "skip" a beat. He was quite worried. Was I giving out on him? He needn't have been concerned.

From time to time, my ignition system gets momentarily out of whack—just like the ignition system on Joe's car. I generate my own electricity, and send out impulses to trigger contraction. But occasionally I will misfire, piling one beat on top of another. It sounds as if I have "skipped"—but I haven't. Joe would be surprised how often this happens when he isn't listening.

After a nightmare he sometimes wakes up and worries because I am racing. That's because when he runs for his life in his dreams, I run, too. Joe's worries actually aggravate things—make me go still faster. If he would calm down, so would I. But if he can't, there is a way to slow me down. The vagus nerves act as a brake. They pass up through the neck—behind the ears, at the hinge of the jaw. Gentle massage here will slow my beat.

Joe blames almost everything on

me—fatigue, dizzy spells and such. But I have little to do with his fatigue, and his occasional dizzy spells usually trace to his ears. From time to time he will be doing desk work, and will get a sharp pain in the chest. He fears that he is about to have a heart attack. He needn't worry. That pain comes from his digestive tract—payment for the heavy meal eaten a couple of hours earlier. When I am in trouble, I usually send out a pain signal only after undue exertion or emotion. That's the way I tell him I am not getting enough nourishment to carry the work he is loading on me.

How do I get my nourishment? From the blood, of course. But, although I represent only $1/200$ of the body weight, I require about $1/20$ of the blood supply. That means I consume about ten times the nourishment required by the body's other organs and tissues.

But I don't extract nourishment from the blood passing through my four chambers. I am fed by my own two coronary arteries—little branching "trees" with trunks not much larger than soda straws. This is my weak spot. Trouble here is the greatest single cause of death.

No one knows how it happens, but early in life—sometimes even at birth in the hearts of some Joes—fatty deposits begin to build up in the coronary arteries. Gradually, they can close an artery. Or, a clot may form to close it suddenly.

When an artery shuts down, the portion of the heart muscle it feeds

dies. This leaves scar tissue—perhaps it is no larger than a small marble, but it can be half the size of a tennis ball. How serious the trouble is depends on the size and position of the plugged artery.

Joe had a heart attack five years ago and didn't even know it. He was too busy to notice that tiny twinge of pain in his chest. The artery that clogged was a small one on my rear wall. It took me two weeks to sweep away the dead tissue and repave the area with a scar not much larger than a pea.

Joe comes from a family where heart disease has occurred often, so statistics say that I am going to give him trouble, too. Of course, he can't do anything about his heredity. But he can do a lot to minimize risk.

Let's start with overweight. Joe is getting extra padding around the middle and jokes about his middle-age spread. It's no laughing matter. Every pound of his excess fat contains something like 200 *miles* of capillaries which I have to push blood through. And that is in addition to the work of carrying around each extra pound.

And that brings me to Joe's blood pressure. It's 140/90—the upper limit of normal for his age. The 140 measures the pressure I work against while contracting, and the 90 is the pressure while I am resting between beats. The lower figure is the more important. The higher that figure rises, the less rest I get. And without adequate rest a heart simply works itself to death.

There are a lot of things Joe could do to get his blood pressure down to safer levels. The first is to get rid of excess poundage. He would be surprised at the drop in blood pressure that would follow.

Smoking is another thing. Joe smokes two packs a day—which means he may be absorbing 80 to 120 milligrams of nicotine every 24 hours. This is pretty violent stuff. It constricts arteries, particularly in the hands and feet, which raises the pressure against which I must work. It also stimulates *me* so that I beat more rapidly; a cigarette pushes my beat up from a normal 72 into the 80's. Joe tells himself that it is too late to give up smoking—that the damage is done. But, if he could get rid of that constant nicotine stimulation, things would be easier for me.

Joe could give me a break in other ways. He is a competitive, driving, worrying sort of fellow—you know, the successful-businessman type. He doesn't realize that his constant fretting continually stimulates his adrenal glands to produce more adrenaline and noradrenaline. It's the same old story as with nicotine: tightened arteries, higher blood pressure, a faster pace for me.

The point is this: If Joe relaxes, *I* relax. After all, he doesn't have to be going to a fire all the time. An occasional nap would help. And he might try some light reading instead of that stuff he brings home from the office in his briefcase.

Exercise is another thing. Joe is one of those weekend athletes—who

takes it in big doses. He still likes that rushing-up-to-the-net bit in tennis, as if he were a college boy. When he does this, my work load goes up as high as five times normal.

What Joe *should* be doing is taking regular, mild exercise. A walk of a mile or two a day would help. Climbing a couple of flights of stairs to his office wouldn't hurt either. His office is on the tenth floor, but he could walk up the first two flights, and then catch the elevator. Little things like that would do a lot. As I said, fatty deposits are already beginning to block some of my arteries. This *regular* exercise causes new blood pathways to develop. Then if one artery closes down there are others to nourish me.

Finally, there is diet. I am not asking Joe to become a diet nut. Just the same, fats *seem* to play some role

in building up that plaque forming in my arteries. Joe gets 45 percent of his calories from fats and, like others in industrialized countries who eat this way, he has a 50-50 chance of dying from clogged arteries.

I wish he could see what happens after a heavy fat meal. Tiny fat globules in the blood seem to glue red blood cells together into a sludgy mess. This is the stuff I must push through capillaries. It's quite a job.

I'm not the demanding type. I'll do the best I can for Joe under *any* circumstances. Just the same there are those breaks he could give me: slim down a bit, take regular exercise, relax a little more, cut down on fats and smoking. If he would only do those things, I could keep on working for Joe for a long time.

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Touching Messages

THE Santa Fe *New Mexican* published this open letter: "To the Person Who Stole My Car—You have my deepest sympathy." —AP

NOTE on a Greenwich Village bulletin board: "Dear John, Come home, forgive and forget. I have destroyed that cherry-pie recipe. Helen." —*The Wall Street Journal*

FROM Japan came this compliment to musical-comedy star Barbra Streisand: "Your records are selling like raw fish." —Florabel Muir in *New York Daily News*

THE FIERCE competition between London newspapers is illustrated by the cable sent from the *Daily Express* to its Congo correspondent during the uprising: "Today's *Daily Mail* reports their correspondent shot at yesterday stop Why you not shot at?" —Richard West, *The White Tribes of Africa* (Macmillan)