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ultraviolet rays, destroying them while leaving healthy cells alone.

#### JAGGED SIDE OF THE JOLT

Despite its benefits, however, caffeine punishes those who take it too far: In larger doses, it brings headaches, dizziness, gastrointestinal problems, reduced fine motor control and anxiety. Caffeine also can be fatal, but in such high quantities that death by drinking is highly unlikely. Scientists calculate that a deadly dose is around 10 grams, which is roughly equivalent to downing, in one sitting, 185 cans of Mountain Dew, or 132 cans of Red Bull energy drink, or 125 8-ounce cups of regular coffee, or 30 grande coffees from Starbucks.

#### MAGIC IN THE BEANS

Those statistics are revealing. Despite the growing popularity of energy drinks – and concern over their caffeine content – the gourmet coffee brewed up by shops such as Starbucks provides the biggest buzz in the American diet. And coffee in general is still the main source of caffeine for most Americans. According to one industry statistic, 75 percent of the average U.S. caffeine intake comes from coffee. But after years of negative reports that left coffee lovers feeling guilty about their java, the tide seems to have turned, with a host of studies showing surprising benefits in the beans.

“Historically, coffee was considered to be harmful to health, but early studies were not sufficiently sophisticated

to take into consideration lifestyle issues that occurred with coffee drinking,” explains Peter Martin, M.D., director of Vanderbilt University’s Institute for Coffee Studies. That is, people who drink a lot of coffee are more likely to consume higher-than-normal amounts of alcohol, or to smoke cigarettes, so heavy coffee consumption seemed to be related to poor health. However, “in more recent studies that take lifestyle variables into consideration,” Dr. Martin continues, “it has emerged pretty clearly that coffee consumption has some definite beneficial associations with health.”

More than a dozen studies have shown an association between coffee drinking and reduced severity of type 2 diabetes, Dr. Martin says. It seems that coffee helps regulate blood glucose in some way that is still not clearly understood.

Other studies have linked coffee with protection from Alzheimer’s and Parkinson’s disease, reduced rates of depression, reduced rates of various kinds of cancer – particularly colon and liver cancer – and lower suicide rates.

Some of coffee’s effects are caffeine-related, says Dr. Martin, particularly the Parkinson’s link, which seems to come



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from caffeine’s protective effect on dopamine-producing cells in the brain. In other cases, caffeine is clearly not the major factor: Decaffeinated coffee seems to help with type 2 diabetes just as well as regular coffee. Few of the connections between coffee and disease are very clearly understood at the moment. “Coffee is a very complex conglomeration of biological compounds,” Dr. Martin says.

Researchers at Vanderbilt are particularly interested in compounds in coffee called chlorogenic acids. These include well-known beneficial substances such as antioxidants, which could partially explain some of the healthful benefits seen from coffee drinking. Chlorogenic acids also seem to help balance the stimulating effects of caffeine, Dr. Martin says, offering a calm to go with caffeine’s buzz. “So drinking caffeine in soft drinks is not the same as taking in caffeine through coffee.”

The chlorogenic acids in coffee could potentially be used in the treatment of addiction to drugs such as alcohol, heroin and cocaine, Dr. Martin adds. “We’ve

published some work demonstrating that they interact with the mu opioid receptor, which is very similar to some of the medications that people use for the treatment of alcoholism.” Dr. Martin and other researchers at Vanderbilt studied members of Alcoholics Anonymous and found that they drink a great deal of coffee. “Our hypothesis is that there are these compounds in coffee that tickle the brain in certain ways that might help recovering addicts recover,” Dr. Martin says.

#### TAKING IT TO THE LIMIT

Several of the studies showing health-related benefits to coffee drinking reported the most positive relations among people drinking large amounts – six cups a day, in a recent investigation of the coffee-Parkinson’s link.

Nevertheless, it’s important to remember that caffeine is a “psychoactive stimulant,” points out William Christensen, M.D., an internal medicine specialist on the medical staff at Baylor University Medical Center at Dallas. “Like a lot of things, in moderation it’s fine. I tell my patients that one to three cups of coffee is OK. When you start getting above three cups – that is about 250 milligrams – you start seeing the side effects, including restlessness and sleep issues.”

Just as with alcoholic drinks, “there’s a cutoff,” Dr. Christensen says. “Caffeine in general has a half-life of about six hours, which means that half of it is cleared after six hours, but there’s still some in your system,” says

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