



# Another Atkins Diet Goal: Reducing Seizures

By **Norra MacReady**

**E**va Brantley isn't surprised that a diet originally used to control seizures in children is helping her as well.

"After all," she says, "I'm a child at heart."

At the ripe old age of 37, Brantley is among a handful of adults participating in a study of a modified version of the popular Atkins diet for managing epilepsy that is unresponsive to medications. Since April, when she entered the clinical trial at Johns Hopkins University Hospital, Brantley says her seizures have decreased from as many as six per day to about three per week.

Doctors have known since the 1920s that a high-fat, low-carbohydrate diet similar to Atkins can control seizures in children with epilepsy. The regimen is called a ketogenic diet because when the body relies mainly on fat for energy, it produces byproducts called ketones, which can be measured in the urine. The reasons why this diet decreases the risk of seizures remain unclear.

Like Atkins, the study diet emphasizes fat and protein while limiting sugar, starch and vegetables. However, the ketogenic diet used for epilepsy is much stricter, and it's not easy to follow. Everything the child consumes, including beverages, must be carefully weighed and measured. Because the diet is so limited in sugar and starch, it's especially hard to stay on during social events like birthday parties. And there may be side effects like constipation, weight loss, kidney stones and increased cholesterol.

It's even harder for adults to follow the diet. Not only are they already juggling work, family and social obligations, but they often find the diet unpalatable.

Eric Kossoff, M.D., associate professor of pediatrics and neurology at Johns Hop-

kins University School of Medicine in Baltimore, became interested in the Atkins diet because it also is ketogenic, but much less restrictive than the classic ketogenic diet used in epilepsy treatment. In 2003 he and his colleagues published a preliminary report of their experience with six patients, ranging in age from 7 to 52, whose epilepsy



had not responded to drugs. Three of those patients experienced a marked improvement on the modified Atkins diet and were able to reduce the medications they were taking. Encouraged by these findings, the researchers began seeking volunteers for a larger study.

Enter Eva Brantley, a hairdresser from Rocky Mount, N.C.

Her "spells," as she calls them, began nine years ago, after the birth of her son, Tyler. The earliest episodes were relatively mild: "a sensation of moving when I wasn't really moving." They lasted three to four seconds and occurred three to four times a year. Her seizures continued over the following years, but were never prop-

erly diagnosed or treated. They became more frequent and intense after her daughter, Ashley, was born in December 2003. At one point she was having as many as 24 episodes a day, which she attributes to the stress of caring for her grandfather (who was dying of cancer at the time) as well as for a newborn.

Brantley's gynecologist finally referred her to a neurologist, who ordered a magnetic resonance imaging scan. The MRI revealed an Arnold-Chiari malformation, in which a portion of the cerebellum, the part of the brain that coordinates movement, protrudes down into the spinal canal. But this condition does not cause seizures, and sure enough, even after surgery to correct the malformation in August 2004, her seizures continued.

It was during a visit to the emergency room shortly after the surgery that she was finally diagnosed with epilepsy. She went because her stitches were leaking, and she had a seizure during her examination by the emergency physician. He immediately ordered an electroencephalogram (EEG), during which she had two more seizures. "In all those years, none of the doctors had ever seen me have a seizure," she says. "It was such a relief to have someone see it." After that, the diagnosis was clear.

Once she knew she had epilepsy, Brantley made it her business to learn all she could about her illness. She found out about the clinical trial at Johns Hopkins while surfing the Internet for information.

To participate, volunteers must go to the Johns Hopkins General Clinical Research Center, where they undergo an examination and tests to make sure they're eligible (people with heart or kidney disease or high blood cholesterol are not).

Those who make the cut start the diet under the supervision of Dr. Kossoff, the principal investigator; his partner Saurabh Sinha, M.D.; and dietitian Hannah Rowley, R.D. Some homework is required: Study participants keep a daily seizure log, measure their ketones twice a week through a urine test, and weigh themselves once a week. After one month on the diet, they return to the center for a follow-up visit. For the study, they make additional follow-up visits three and six months out. And if they choose to stay on the diet after that, Dr. Kossoff asks them to return regularly for checkups.

Compared to the actual Atkins diet, which allows up to 20 grams of carbohydrate per day to start and increases gradually from there, the diet used in the study permits participants to eat only 15 grams of carbohydrate per day. That can be a challenge, because it means limiting most starches like bread and potatoes as well as sources of sugar like fruit, fruit juices and sweets. Protein is permitted in a ratio of one to two grams per kilogram of body weight (a kilogram is a little over two pounds). The remaining calories come from fatty foods like cream, butter, mayonnaise, bacon and peanut butter, although vegetables are permitted in limited amounts. "We encourage fat intake

because it promotes ketone formation, which is why we think the diet works," Dr. Kossoff says.

According to Brantley, the diet is easy to follow, even in restaurants. "The first few days, I went through sugar withdrawal," she says, "but since then it's gone smoothly." A typical meal might consist of roast chicken or meat, vegetables and a salad with dressing. Bacon and eggs is a favorite breakfast. She does occasionally succumb

### The popular Atkins diet offers adults in the study a high-fat, low-carb alternative to treat epilepsy.

to a sugar craving, but finds that her seizures become more frequent for a day or two afterward.

Besides, the diet has some unanticipated benefits: Since she started it, her cholesterol has dropped from 131 mg/dL to 114 mg/dL — and she's lost 29 pounds!

Her husband, Al, who started the diet with her to be supportive, experienced even more dramatic results: His chole-

sterol went from 228 mg/dL to 148 mg/dL after only six weeks, and he's lost a whopping 42 pounds.

Although she's officially completed the study, she will continue to see Dr. Sinha for checkups at six-month intervals. "Everyone has been very helpful whenever I've needed to reach them," she says.

Dr. Kossoff says the investigators would like to enroll 15 more people into the ongoing trial. Patients must be at least 18 years old, have seizures at least once a week, and have tried at least two drugs with unsatisfactory results. The study will cover the cost of all clinic visits, examinations, laboratory tests and consultations with doctors and dietitians, but volunteers must make all four official trips to the research center in Baltimore at their own expense.

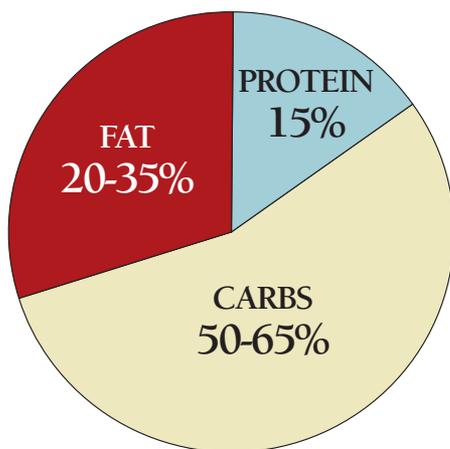
"It was," says Eva Brantley, "definitely worth it." NN

*Norra MacReady is a book author whose health and medical articles have appeared in The Economist and Condé Nast Traveler.*

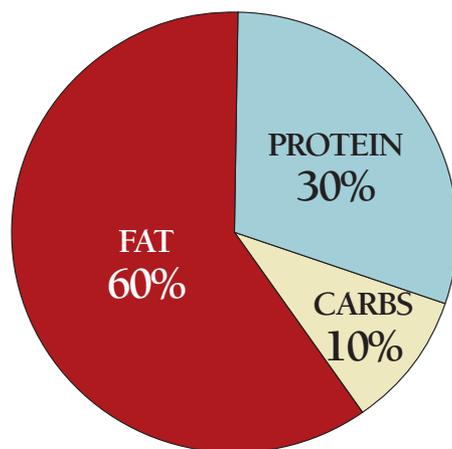
**For more information on this trial, contact Dr. Kossoff at 410-614-5806.**

**For clinical trials listed in the AAN's journal *Neurology*, visit [www.neurology.org/clinicaltrials](http://www.neurology.org/clinicaltrials).**

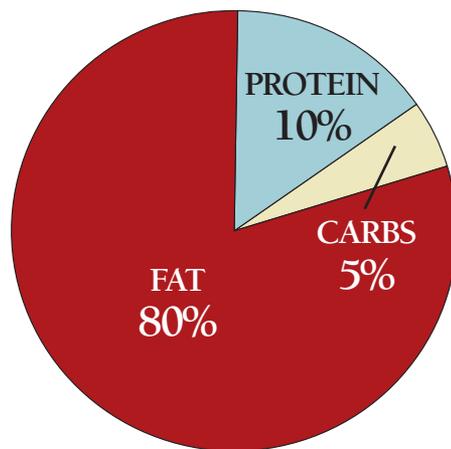
## FAT COMPROMISE: Atkins as a modified ketogenic diet



**USDA Recommended Diet**



**Atkins Diet**



**Ketogenic Diet**