

erocurrent

Monthly newsletter from the **epilepsy** RESOURCE CONNECTION

Diet of Whipping Cream, Butter, Oil Can Help Control Pediatric Seizures

A new study by researchers at The Medical College of Wisconsin and Children's Hospital of Wisconsin has shown that the highly regimented ketogenic diet, a high-fat nutritional therapy used to limit seizures, requires long-term medical management and strong parental commitment to achieve both sufficient nutrition and improved seizure control in children.

The study, by Mary L. Zupanc, M.D., professor of pediatrics and medical director of the pediatric epilepsy program, and Beth Zupanc-Kania, R.D., C.D., appeared in the Nov. 4, 2008, issue of *Epilepsia*. Their approach to the diet includes a thorough diet history and metabolic assessment of the child, long-term seizure, nutrition, and medical monitoring, and vitamin/mineral supplementation.

"This diet cannot be tried by parents without close medical management and follow-up," cautions Dr. Zupanc. "It requires careful metabolic monitoring and precise supplementation of missing nutrients."

Their approach has been effective, as seen in an as yet unpublished study of 43 patients at Children's Hospital, between the ages of twelve months and 15 years. Of these children who started on the ketogenic diet between 2002 and 2006, half had a greater than 90% reduction in seizure frequency. The majority of the children who responded to the diet had either a severe form of childhood epilepsy called Lennox-Gastaut syndrome or symptomatic generalized epilepsy. Their brain activity, as measured by electroencephalograms (EEGs) also improved significantly, paralleling the dramatic changes in seizure control.

"Lack of compliance or of consistent medical monitoring can lead to poor growth, impaired nutrition and seizure recurrence," says Dr. Zupanc. "There has to be careful monitoring and consistent communication between the dietitian and the physician managing the diet. Metabolic screening should be performed after the first month and every three months afterward. The family should keep a detailed seizure diary. Growth and weight parameters require ongoing monitoring, as do side effects such as lethargy or nausea, which may indicate a hidden metabolic defect."

The carbohydrate-restricted ketogenic diet also requires strong parental support, according to Zupanc-Kania. "Fat comprises between 80 and 90% of the diet's calories and is provided by foods such as whipping cream, butter and vegetable oils. The remaining calories are allocated to essential protein requirements from meat and fish, and secondarily to low-carbohydrate vegetables and fruit," she says. "The elimination of carbohydrate-rich foods such as simple sugars, bread, pasta, cereals grains and milk makes this diet difficult for many patients to follow."

While the mechanism of seizure control by the ketogenic diet is not fully understood, the diet forces the body to accumulate large amounts of compounds such as acetone and acetoacetic acid, produced by the oxidation of fatty acids. The diet also restricts the intake of micronutrients such as vitamin D, calcium and phosphorus, which may already be low in those on long-term anti-epileptic drug therapy.

✉MEDICAL COLLEGE OF WISCONSIN



Unique Nerve-Stimulation Device Proves Effective Against Epilepsy

Epilepsy is a common medical condition characterized by convulsions and short periods of confusion. It affects more than 50 million people worldwide. But intractable epilepsy, which affects more than 1 million Americans and is often resistant to drug treatment and surgery, is arguably worse.

But in a just completed clinical trial, a unique nerve-stimulation treatment for intractable epilepsy reduced the number of seizures by more than 50%. In the March edition of the journal *Neurology*, UCLA neurology professor Christopher M. DeGiorgio and colleagues report the results of the long-term pilot trial, which demonstrated the effectiveness of the new treatment, called trigeminal nerve stimulation (TNS).

The results, though preliminary, are very encouraging, DeGiorgio said. Those participating in the trial for three months saw a 66 percent reduction in the number of seizures, those participating for six months saw a 56% reduction and those who completed one year saw a 59% reduction in seizures. One of the subjects who participated for a full year had a 90% reduction in seizures.

The trigeminal nerve extends into the brain from the face and forehead and is known to play a role in seizure inhibition. The stimulator, about the size of a large cell phone, attaches to a belt or can slip into a pocket. Two wires from the stimulator are passed under the clothing and connected to electrodes attached to the forehead by adhesive. The electrodes, which can be covered by a cap or scarf, transmit an electrical current to the nerve.

"People with intractable epilepsy who have continuing seizures are often drug-resistant," DeGiorgio said. "In addition, anti-seizure drugs can have significant side effects on thinking and alertness."

Epilepsy brain surgery can be very effective, he said, but some patients are not ideal candidates because there is no single focal point in the brain for their seizures.

A larger clinical trial to further test for safety and effectiveness is now underway. The investigators hope that eventually a device can be permanently implanted above the eyebrow that would stimulate the trigeminal nerve and replace the external device.

"TNS is a promising alternative mode of neurostimulation because the trigeminal nerve can be stimulated in minimally invasive fashion," DeGiorgio said. "The major branches of the trigeminal nerve in the face are located close to the surface of the skull; that allows physicians to assess response prior to permanent implantation of a future device."

"For all of these reasons, we need to find non-drug and non-surgical alternatives," he said. "The results of our study are very encouraging and support further investigation into the safety and efficacy of TNS." ✉MEDICAL NEWS TODAY

Adult Epilepsy Support Group

A Group for Adults with Epilepsy to Share Common Experience Meets on Second Tuesday of the month @ 5:00 PM.

LOCATION: 2919 W. Second Street* in Wichita
*2nd and St. Paul St. between West Street and Meridian Ave.
Wichita MTA Bus Service is available to and from meeting —
For information on MTA Service, call: 265-7221



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Surgery Found To Be Safe for Babies and Toddlers with Seizures

A new study published in *Epilepsia* reveals surgery for babies and toddlers suffering from epilepsy is relatively safe and is effective in controlling seizures. The findings also show that early surgery may have a positive impact on babies' brain development.

The study reviews epilepsy surgeries in children under three years of age across all pediatric neurosurgical centers in Canada between 1987 and 2005. 116 children had epilepsy surgeries in 8 centers across Canada. 82% of these children started to suffer seizures in their first year of life.



The children generally underwent major brain operations, including removal of or disconnection of half of the brain. Despite such large operations, there were few complications and only one death. At the time of surgery, children were having an average of 21 seizures per day, with one child having as many as 600 seizures per day. One year after surgery, 67.3% were seizure free, 14% had a greater than 90% improvement in seizures. Only 7.5% did not benefit from surgery. Development improved in 55.3% of the children after surgery.

"The results of this study lead us to conclude that epilepsy surgery in children under three years is relatively safe and is effective in controlling seizures," says Dr. Paul Steinbok of British Columbia's Children's Hospital and the University of British Columbia, lead author of the study. "Thus, very young age is not a contraindication to surgery in children with epilepsy that is difficult to control with medications."

A large percentage of infants and young children who might benefit from epilepsy surgery are not undergoing the procedure. Currently, such children are often treated ineffectively with various anti-seizure medications on the assumption that surgery should be considered a treatment of last resort. The results of this study argue that surgery may be a better option than continuing drug management and should be considered earlier in the treatment process than is typically done. ↔MEDICAL NEWS TODAY

Southeast Kansas

Epilepsy Support Group

Group Meets on Third Monday of the month @ 6:00 PM.

First Church of the Nazarene

816 East Quincy Street in Pittsburg, Kansas

For more info, please call David: (620) 308-6519

• Discounted Transportation Available thru Sammy's Cab & Taxi •

Common AEDs May Increase Risk of Cardiovascular Problems

An important clinical repercussion in the treatment of epilepsy has been discovered by a research team led by Scott Mintzer, M.D., assistant professor in the Department of Neurology and the Jefferson Comprehensive Epilepsy Center at Thomas Jefferson University. The team has determined that two of the most commonly prescribed anti-seizure medications may lead to significantly increased levels of cholesterol, C-reactive protein and other markers of cardiovascular disease risk. The finding - set to be published in the March 18th online edition of *Annals of Neurology* - may help doctors manage the care of patients with seizures more effectively by prescribing different anti-seizure medications that will not adversely affect cardiovascular health.



The study involved two of the most widely-prescribed anticonvulsants - phenytoin (Dilantin®) and carbamazepine (Tegretol®, Carbatrol®) - which have potent effects on many enzymes in the body involved in different areas of metabolism. The researchers recruited 34 epilepsy patients taking either one of those two drugs who were being switched over to one of two newer anti-seizure drugs which do not widely affect enzymes - lamotrigine (Lamictal®) or levetiracetam (Keppra®). The goal was to determine if the change affected the patients' cholesterol levels and other key markers of cardiovascular disease.

Just 6 weeks after the patients' drugs were switched, there were significant declines in total cholesterol, non-high-density lipoprotein (commonly referred to as 'bad') cholesterol, triglycerides and C-reactive protein, suggesting the older, commonly-used drugs might substantially increase the risk of cardiovascular disease.

"The epilepsy patients in this study saw a rapid and clinically significant improvement in several markers related to cardiovascular disease, including a decrease in total cholesterol that averaged 26 points. This is almost certainly not due to some positive effect from the new drugs. It's a consequence of being taken off the older ones, which were causing the cholesterol and other markers to be elevated in the first place," said Dr. Mintzer. "While more investigation is needed, these results may help physicians better understand the risks of these drugs and choose the most appropriate treatment for their epilepsy patients, especially those who are already at risk for cardiovascular disease or have a family history of it."

The results of this study could have far-reaching effects on how current, and future patients are, or will be, treated.

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