

West Michigan Edition

M.D. NEWS

Special Feature

Dr. Jürgen Lüders performs surgery in the operating room at Saint Mary's.

New Epilepsy Program at Saint Mary's Health Care Includes Surgery

New Epilepsy Program at Saint Mary's Health Care Includes Surgery

By Patti L. Mindock

Once considered a last resort, surgical management of epilepsy is now an integral part of treatment for patients whose seizures do not respond to medication. Led by neurosurgeon Jürgen Lüders, the Saint Mary's Health Care Epilepsy Program in Grand Rapids features full diagnostic testing, neuropsychological evaluations, patient education, medication management, epilepsy monitoring unit evaluations and surgical consultation, if warranted. Monitoring is currently conducted at the Cleveland Clinic, but will eventually be in-house as part of a dedicated Epilepsy Monitoring Unit (EMU) at Saint Mary's Health Care in Grand Rapids, scheduled for completion in early 2006. Saint Mary's is a member organization of Trinity Health, the fourth largest Catholic health care system in the country.

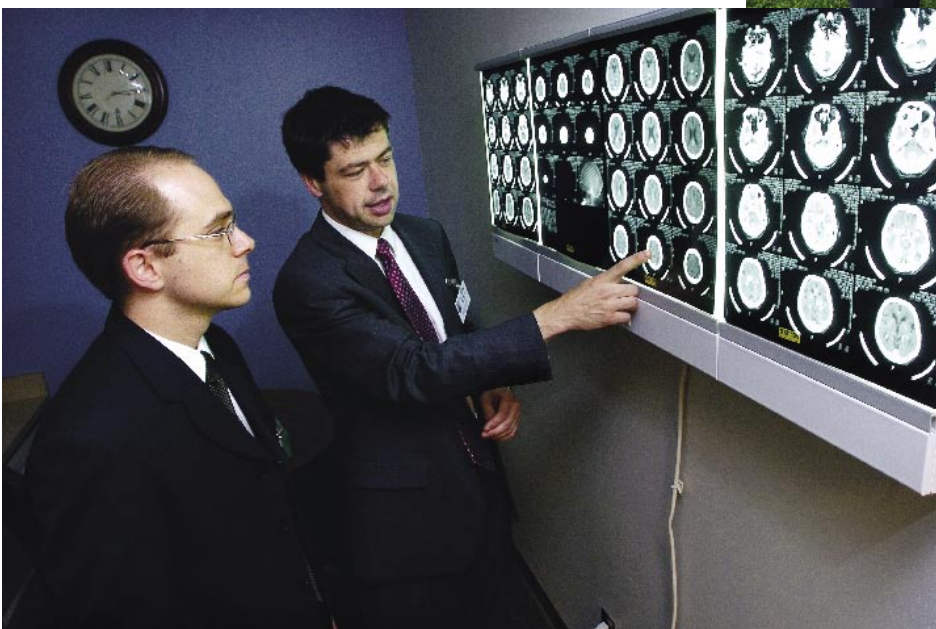
The new program is being implemented in three phases. Currently, the Cleveland Clinic is providing an epileptologist and the monitoring required prior to surgery two days each week in Grand Rapids. Following the initial visit, patients return to Saint Mary's for their surgery and follow-up care. The majority of surgeries will be temporal lobectomies and extra-temporal (extra-limbic) lesional resections, plus vagal nerve stimulators and callosotomies. The second phase of the program involves

Right: Saint Mary's Health Care Epilepsy Program team members Jürgen Lüders, MD, Becky Clanton, RN, and Christopher Skidmore, MD.

Below: Drs. Skidmore and Lüders review diagnostic images.



PHOTOS COURTESY OF SAINT MARY'S HEALTH CARE



the completion of the basic epilepsy surgery center/EMU at Saint Mary's, which includes the recruitment of a full-time epileptologist. The EMU will debut as a four-bed unit, with plans for future expansion.

The third phase is expected to be an advanced epilepsy surgery center. The major focus will remain on treating adults and adolescents with the possible inclusion of young children. Expanded staffing could include a second full-time epileptologist

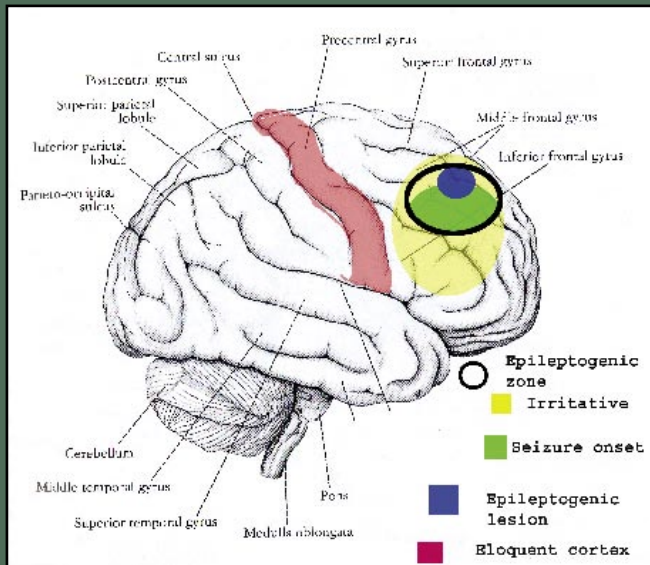
Epilepsy Stats/West Michigan

Epilepsy and seizures affect 2.5 million Americans. Prevalence of active epilepsy tends to increase with age, with an estimated 600,000 people over the age of 65 with epilepsy in the U.S. today. (Source — The Epilepsy Foundation)

Most epidemiological studies state the prevalence of epilepsy in the general population to be about .85 percent. Using an area population of 3.5 million people in West Michigan, the prevalence of epilepsy locally is about 30,000 people. Of all patients with epilepsy, 60 percent could be well controlled with medication. In the remaining 40 percent, at least half have focal epilepsy and are potential surgical candidates. Approximately half of the patients with intractable focal epilepsy are good surgical candidates (about 3,000 patients).

The incidence of new patients per year is 10 percent that of the prevalence, which is approximately 3,000 surgical patients existing today in West Michigan, with 300 new surgical patients possible per year. (Source: Jürgen Lüders, MD — Saint Mary's Epilepsy Program).

Theoretical Epileptogenic Zone



This diagram illustrates the spatial relationship of selected zones that are used to define the location and extent of the theoretical epileptogenic zone. It also shows the adjacent “eloquent cortex” — a region that the neurosurgeon cannot remove if he wants to avoid neurological deficits. The irritative zone and seizure onset zone are both measured by EEG and the epileptogenic lesion is visualized by MRI. Complete excision of the epileptogenic zone results in seizure freedom.



Patient undergoes EEG testing.

ANTHONY DUGAL PHOTOGRAPHY

and additional multidisciplinary support teams. Surgical offerings may then include nonlesional resections, invasive evaluations and hemispherectomies.

THE CLEVELAND CLINIC CONNECTION

Epileptologists on rotation to Grand Rapids from the Cleveland Clinic include Dr. Christopher Skidmore. “Cleveland is one of the largest epilepsy centers in the country and a leader in epilepsy surgery and research,” he notes. “We know from a medication study conducted in Scotland (“Early Identification of Refractory Epilepsy,” Patrick Kwan, MD, and Martin J. Brodie, MD, 2/3/00 NEJM) that once a patient has failed to respond to two medications, the chances of other subsequent meds working is only between five to 10 percent. If a patient has focal epilepsy and we do surgical intervention, there may be an 80 percent chance of cure,” Dr. Skidmore stresses. In the early phase of the Saint Mary's program, Dr. Skidmore and other epileptologists who opt to join the consulting team, will spend two to three days per week at the Grand Rapids facility.

Although the local EEG/video monitoring unit will eventually eliminate the need for patients to travel to Cleveland, some of the more invasive monitoring — using subdural or depth electrodes — may keep the collaboration ongoing. One of the other major connections between the two medical entities is a familial one. Dr. Jürgen Lüders completed his neurosurgery residency under the expert tutelage of the chairman of the Department of Neurology at the Cleveland Clinic, who also happens to be his father, Dr. Hans Lüders, a renowned epilepsy specialist.

PRESURGICAL EVALUATION HONES IN ON 'ZONES'

Any type of damage to the brain can produce seizures. The most frequent causes include congenital malformations, previous head injury, previous brain surgery, tumors, brain infections (meningitis or abscess), stroke and arteriovenous malformations (AVMs). Medication management is the first course of treatment, with the ultimate goal being a patient who is seizure free. There are more than a dozen anti-epileptic medications available on the market today.

Table I: Definitions

Symptomatogenic Zone	Region of cortex which generates the initial seizure symptomatology
Functional Deficit Zone	Region of cortex which in the interictal period is functioning abnormally
Epileptogenic Zone	Region of cortex which can generate epileptic seizures
Irritative Zone	Region of cortex which generates interictal epileptiform discharges in the EEG
Ictal Onset Zone	Region of cortex from which the clinical seizures originate
Epileptogenic Lesion	Structural lesion which is causally related to the epilepsy

Table II: Methodologies Used in Presurgical Evaluation

Symptomatogenic Zone	Patient report Video recording
Functional Deficit Zone	Neurological exam Neuropsychology Nonepileptiform EEG abnormalities PET SPECT
Epileptogenic Zone	Theoretical concept
Irritative Zone	EEG
Ictal Onset Zone	EEG
Epileptogenic Lesion	Structural imaging Tissue pathology

(Zones Diagram, Tables I and II — Source Credit to Jürgen Lüders, MD)

“The ideal candidate for surgery is a patient with focal epilepsy who does not become seizure-free after optimal medical treatment,” Dr. Lüders points out. An extensive patient history, EEG/video evaluation and neuroimaging (including MRI and PET) helps to pinpoint the theoretical epileptogenic zone — the region of cerebral cortex that generates the seizure. Lobectomy and cortical resection will then be the primary surgical options at Saint Mary’s. According to the National Institutes of Health, the success rate of the procedures ranges between 30 and 70 percent, depending on the area of the brain removed. Dr. Lüders and Dr. Skidmore cite the cure rate of 75 – 80 percent for temporal lobectomy, based on their work at the Cleveland Clinic.

Dr. Skidmore notes the necessity of building the type of multidisciplinary team now in place at Saint Mary’s. “Our patient management conference prior to surgery will include medical doctors, surgeons, nurses, a neuropsychologist, psychiatrist and the radiologist,” he says. “The epileptologist will brief the group about the patient and the seizure history, followed by a review of the patient’s EEG, MRI or PET scan. The neuropsychologist will provide a report, and the

psychiatrist will help the team understand the psychosocial aspects of how this patient is emotionally handling their epilepsy. The surgeon will then advise the team whether the patient is a good candidate for surgery.” The Cleveland consulting epileptologist calls the team approach “effective and efficient.”

“There are a lot of people with epilepsy in West Michigan being treated by their primary care doctors who have seen their seizures decrease, but are not seizure free,” Dr. Lüders adds. “The seizures are still disabling them to a point where they can’t work or drive a vehicle. I’m seeing some patients who have been on certain medications for over 10 years and are now suffering chronic side effects. Surgery or more specialized treatment can cure them so they can have normal lives.” In epilepsy patients being treated with medication only, Dr. Skidmore says there still is a risk of SUDEP — Sudden Unexplained Death of Epilepsy Patients. “In refractory patients, there’s a one percent mortality risk per year, even in those with simple staring spells,” he states. “As an epileptologist, I focus on preventing the mortality and morbidity associated with epilepsy, whether it’s a medical or surgical cure for those patients.”

As the program at Saint Mary’s develops, research components may be added to ensure all members of the multidisciplinary team have access to advances in the field of epilepsy. “We can have a dramatic impact on

our patients’ lives,” says Dr. Lüders. “Our ideal scenario is to position this West Michigan program at Saint Mary’s as a nationally recognized epilepsy treatment center. We are well on our way to that goal.”

Jürgen Lüders, MD, medical director for the Saint Mary’s Epilepsy Program, received his medical degree from the University of Chicago, Pritzker School of Medicine in Illinois. He completed his neurosurgery residency at the Cleveland Clinic Foundation in Ohio. Dr. Lüders also studied at the Royal College of Surgeons in Dublin, Ireland.

Christopher Skidmore, MD, completed medical school at Saint Louis University in Missouri, followed by his residency, internship and fellowship in neurology — all at The Cleveland Clinic Foundation in Ohio. ■

For More Information

The Epilepsy Program, Saint Mary’s Health Care, 260 Jefferson, SE, Suite 203, Grand Rapids, MI 49503; phone: 616-752-5900. Further information on Saint Mary’s is available at: www.smhealthcare.org.