



Movements in Deep Brain Stimulation

Q&A WITH THREE LEADERS OF THE SWEDISH DBS PROGRAM

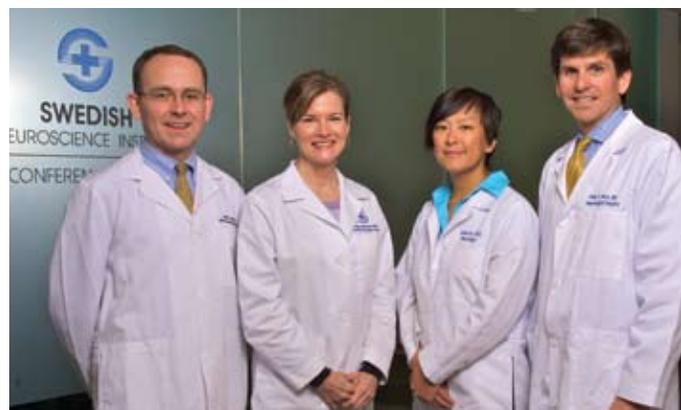
Deep brain stimulation can be considered a “brain pacemaker,” which restores neurological function by interfering with abnormal electrical impulses in patients with conditions such as Parkinson’s disease. DBS has already helped thousands of patients with movement disorders, and now there are some promising new indications.

The DBS program at Swedish Neuroscience Institute provides this treatment option to dozens of patients with Parkinson’s disease each year. *Brain Waves* asked three leaders of the DBS program to describe this remarkable technology. **Susie Ro**, M.D., SNI Neurology, is a movement disorders specialist who determines patient eligibility for DBS. SNI neurosurgeon **Pete Nora**, M.D., performs the exacting neurosurgical procedure in which electrodes are introduced into a targeted region deep within the brain. **Peggy Shortt**, M.N., ARNP, and her nurse practitioner colleagues, perform microelectrode recording and intra-operative testing during the DBS electrode implantation, and postoperatively direct the programming of the fully implanted neurostimulation system.

BW: How would you describe the ideal DBS candidate with Parkinson’s disease?

Ro: Some causes of parkinsonism, such as progressive supranuclear palsy (PSP) and Lewy body disease, do not do well with DBS. Therefore, a clear diagnosis is the foremost criterion for the ideal DBS candidate with Parkinson’s disease.

Ideal candidates should also have a robust response to levodopa, because symptoms that improve with levodopa (e.g., tremors, stiffness and slowness) also improve with DBS. Patients who have a lot of dyskinesias (i.e., abnormal movements caused by levodopa) or wearing-off phenomenon (i.e., needing doses more often than every three to four hours) can have less severe ups and downs, and more “on” time with DBS. Some



Deep brain stimulation is a highly specialized treatment that can improve the symptoms of Parkinson’s disease, and also shows great promise with many other disorders. The leaders of the Swedish DBS team include, from left to right, Ryder Gwinn, M.D., Peggy Shortt, M.N., ARNP, Susie Ro, M.D., and Peter Nora, M.D.

patients who have severe stiffness or slowness, as well as those who cannot tolerate the side effects of high doses of medication, are also potential candidates.

Additionally, the best candidates will be in the middle stage of their disease and functioning well when their medications are working, and have realistic expectations, a good support system and easy access to programming.

BW: What symptoms do not improve with DBS?

Ro: Symptoms that do not improve with levodopa, including some types of balance, speech and memory problems, do not improve with DBS. If a patient cannot walk on their best on-medicine day, DBS will not fix that problem.

We are cautious about patients approaching 80 years of age. Although there is no set age cutoff, younger patients do better in general.

DBS is not a last-resort treatment for end-stage PD. Patients with uncontrolled depression, anxiety, memory loss or severe medical problems are at high risk of complications following surgery.

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Deep Brain Stimulation

(Continued from page 1)

BW: What percentage of your patient referrals for DBS have you determined to be good candidates? Are some patients reasonable candidates even though they don't meet criteria?

Ro: Even though only 10-15 percent of PD patients eventually become good DBS candidates, it is a markedly underutilized treatment. Many good candidates are never referred for DBS at all. As a surgical referral center, we get a fairly high percentage of DBS referrals who turn out to be good candidates for surgery. Our selection guidelines are fairly strict, but they are only guidelines. We consider each patient individually. Because we are very selective, the patients who have surgery in our program have excellent outcomes.

BW: Are there conditions other than PD for which DBS is emerging as an accepted therapy? Do you treat, or plan to treat, patients with these conditions at SNI?

Ro: DBS is a well-established treatment for essential tremor and primary generalized dystonia. We also treat other forms of cerebellar outflow tremor following stroke, trauma and multiple sclerosis, as well as certain types of dystonia. We are expanding into other movement disorders, including severe Tourette's syndrome, and neuropsychiatric disorders, such as obsessive-compulsive disorder and depression.

BW: The target area for the electrode tip is very deep in the brain. How do you place the electrode with such a high degree of accuracy?

Nora: Several days before surgery we obtain a high resolution MRI

scan of the brain, which we use for targeting and to confirm the absence of structural abnormalities. We use these MRI images and a stereotactic CT scan just prior to surgery to select the appropriate target. During the procedure we perform microelectrode recordings of the selected target nuclei. The electrode is temporarily activated to ensure the patient obtains expected benefits without unwanted side effects.

BW: What is the structure of the electrically active tip of the electrode?

Nora: There are four electrical contacts along the axis of each electrode. This allows for the safest and simplest surgical placement while providing the maximum programming options for our patients.

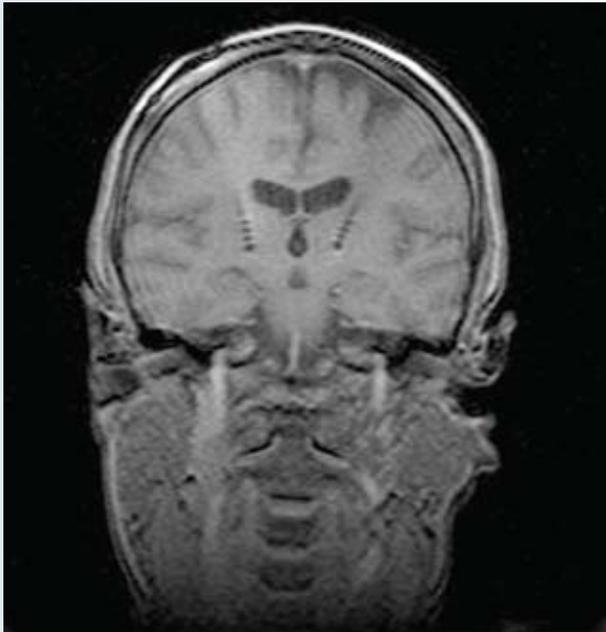
BW: Nationally is there a significant complication rate?

Nora: The complication rate for DBS is approximately 5 percent and includes hemorrhage, infection and neurological injury. The most concerning of these are hemorrhage and neurological injury, which makes up only about 1 percent of all complications. Thus, the rate of significant complications is very low.

BW: What is the microlesion effect?

Nora: The microlesion effect refers to transient clinical improvement seen in patients after their electrodes have been placed but not yet activated. It is a sign the electrode is in excellent position, although it is not seen in every patient that does well.

BW: Following electrode implantation, the patients undergo



A coronal T1-weighted image demonstrates the presence of bilateral DBS electrodes in a patient with Parkinson's disease.

programming. Could you describe this process?

Shortt: The patient is programmed in the “medication off state” without the influence of medications usually taken to suppress the same symptoms we are planning to treat with stimulation. We can change many parameters using a radio-frequency device we hold over the patient’s implant, including electrical polarity, voltage, frequency, pulse width and rate. We choose the best symptom improvement for the patient’s needs to select the field of stimulation.

BW: What is the waiting time between electrode implantation and programming?

Shortt: In general, the patient has an appointment with the DBS clinic about two weeks after surgery. We perform initial programming with stimulation mapping to determine the best benefit for the patient with the least side effects.

BW: Do you see immediate changes in neurological function during the programming process?

Shortt: Immediate improvement is often noted. It may take weeks or months of follow-up programming, however, to maximize motor benefits through reduced tremor, rigidity, bradykinesia, dyskinesia or dystonia. This is due in part to the specific area of the brain that was treated, which is different for each disease process. Patients with essential tremor may have the most immediate improvement with fewer programming sessions.

Seattle Brain Cancer Walk

Bring your family, friends and co-workers to the Seattle Brain Cancer Walk and take a step toward finding a cure for brain cancer! The event starts at 8:30 a.m., Saturday, May 30, at the Mercer Island High School Track.

All funds raised through the Seattle Brain Cancer Walk benefit the Center for Advanced Brain Tumor Treatment (CABTT) at the Swedish Neuroscience Institute.

Each year 22,000 Americans are diagnosed with a malignant brain tumor. With limited treatment options and a life expectancy of only one to two years, brain cancer is a frightening disease to face. Through ground-breaking research and personalized treatment plans, the Center for Advanced Brain Tumor Treatment is improving outcomes for patients today and working toward a cure for brain cancer.

Registration for the Seattle Brain Cancer Walk includes a T-shirt and costs \$25 per person through May 26. Registration is \$30 on the day of the event. Participants will enjoy refreshments, live music and entertainment. After the walk, participants are invited to stay for an awards ceremony and tribute to brain cancer survivors and their families. For more information or to register for the event, please call 206-320-3900 or visit www.braincancerwalk.org. ❖



PHOTO COURTESY OF THOR RADFORD

In patients with Parkinson’s disease, the brain stimulation titration is gradual because of the importance of balancing the dosing of medicines and stimulation. The patient will notice optimal improvement in three to six months. In dystonia patients, programming visits are monthly and the full benefit of stimulation may take up to a year following DBS implantation. ❖

John W. Henson, M.D., FAAN

Deep Brain Stimulation at SNI

For more information about deep brain stimulation at Swedish Neuroscience Institute, go to www.swedish.org/neuroscience. To consult or refer a patient, please call 206-320-2847.



Swedish Neuroscience Institute Staff

The Swedish Neuroscience Institute has gathered outstanding neurologists, neurosurgeons, neuroradiologists and neuropathologists to serve the Pacific Northwest and beyond. These dedicated individuals provide a full range of services in virtually every neurological field – from sophisticated diagnostics and advanced medical and surgical treatments to progressive neurological rehabilitation.



James D. Bowen, M.D.
Multiple Sclerosis and Neurology

Title: Medical Director, Multiple Sclerosis Program

Medical Degree: The Johns Hopkins University, Baltimore, Md.

Residency: Neurology and Internal Medicine – University of Washington

Medical Center, Seattle, Wash.

Board certification: Neurology

Dr. Bowen provides comprehensive services to patients with multiple sclerosis at the Swedish Neuroscience Institute. Prior to coming to Swedish, Dr. Bowen was medical director of the Multiple Sclerosis Center at Evergreen Medical Center in Kirkland, Wash. He is also a former director of neurology services at the Multiple Sclerosis Center at the University of Washington. His research interests include rehabilitation issues in multiple sclerosis, investigational medications for the treatment of MS and risk factors for dementia. He has published widely on neurologic disease, including multiple sclerosis, Alzheimer's, dementia, stroke and myasthenia gravis.



Glen J. David, M.D.
Physical Medicine and Rehabilitation, Pain Management

Medical Degree: St. George's University School of Medicine, Bayshore, N.Y.

Residency: Physical Medicine and Rehabilitation – Cleveland Clinic Hospitals and Case Western Reserve

University, Cleveland, Ohio

Fellowship: Pain Management – University of Washington, Seattle, Wash.

Board Certification: Physical Medicine and Rehabilitation, and Pain Management

Dr. David is a board-certified physical medicine and rehabilitation, and pain management physician who specializes in nonsurgical spine care and interventional spine procedures. He treats disorders of the spine, back, neck and general musculoskeletal conditions. Dr. David is member of the American Academy of Physical Medicine and Rehabilitation, the American Society of Interventional Pain Physicians, the American Academy of Pain Management and the International Spine Intervention Society. His research interests include interventional spine and pain management. He is a frequent presenter on the topics of nonsurgical spine care, pain management and rehabilitation.



David A. Hanscom, M.D.
Orthopedic Surgery and Spine

Medical Degree: Loma Linda University School of Medicine, Loma Linda, Calif.

Residency: Orthopedics – University of Hawaii Medical School, Honolulu

Fellowship: John H. Moe Spine Deformity Fellowship – University

of Minneapolis, Minn., Orthopedic Trauma – University of California Davis, Davis, Calif.

Board Certification: Orthopedic Surgery

Dr. Hanscom has spent many years performing surgery for complex spinal deformity and has developed a strong interest in pain associated with spinal problems. Dr. Hanscom has developed a structured approach called Defined Organized Conservative Care (DOCC). Although surgery is performed if required, Dr. Hanscom implements the DOCC protocol to avoid surgery whenever possible. DOCC concentrates on sleep, stress management, rehabilitation, medications, goal setting and education. Dr. Hanscom also has developed a classification system to better determine which patients require surgery.



John W. Henson, M.D., FAAN
Neuro-oncology and Neurology

Title: Director of Neurology, Swedish Neuroscience Institute; Medical Director, SNI Center for Advanced Brain Tumor Treatment

Medical Degree: Loma Linda University School of Medicine, Loma Linda, Calif.

Residency: Neurology - Vanderbilt University Medical Center, Nashville, Tenn.

Fellowship: Neuro-oncology - Memorial Sloan Kettering Cancer Center, New York City; Diagnostic Neuroradiology - Massachusetts General Hospital, Boston, Mass.

Board Certification: Neurology

Dr. Henson specializes in the diagnosis and treatment of patients with tumors of the central nervous system. He was formerly an associate professor of neurology at Harvard Medical School and an associate neurologist at Massachusetts General Hospital in Boston. While at MGH, he served as executive director of the Brain Tumor Center and maintained both radiology and neuro-oncology practices. Dr. Henson's research focuses on brain tumor imaging and clinical-genetic correlations in primary brain tumors. Dr. Henson sits on the Science Committee of the American Academy of Neurology and serves as science editor for AAN.com.



Angeli S. Mayadev, M.D.
Physical Medicine and Rehabilitation,
Multiple Sclerosis

Medical Degree: Northeastern Ohio Universities College of Medicine, Rootstown, Ohio

Residency: Physical Medicine and Rehabilitation - University of Washington

Medical Center, Seattle, Wash.

Fellowship: Multiple Sclerosis - University of Washington Medical Center, Seattle, Wash.

Board Certification: Physical Medicine and Rehabilitation

Dr. Mayadev provides physical medicine and rehabilitation services to patients in the Multiple Sclerosis Program at Swedish Neuroscience Institute. Prior to coming to Swedish, Dr. Mayadev was an instructor in the Department of Physical Medicine and Rehabilitation at the University of Washington. Her clinical interests include musculoskeletal rehabilitation in the setting of neurologic disease, electrodiagnosis, neuropathy, and neuromuscular disorders. Her research interests include spinal stenosis in the setting of multiple sclerosis, and factors that influence perceived stress in patients with multiple sclerosis.

Answer to Test Your Knowledge Question (For the question, see page 7): The open ring sign is most consistent with a tumefactive demyelinating lesion. The enhancing ring is in white matter and the opening abuts cortex or basal ganglia. See *Neurology* 54:1427-1433.



Swedish Neuroscience Specialists

www.swedish.org/neuroscience

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Anastacia Wall, PA-C

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PHYSICIAN
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Seattle, WA 98122

SEE REVERSE FOR SNI
CONFERENCE SCHEDULE.

Swedish Neuroscience Institute Conference Schedule

SNI Grand Rounds

Swedish Education & Conference Center Swedish,
Cherry Hill Campus

7:30-8:30 a.m.

Thursday, May 21

Amyotrophic Lateral Sclerosis Focality:
Motor Neuron Degeneration
in a House of Mirrors
(*John Ravits, M.D.*)

Thursday, June 4

Developing Mouse Brain Atlas and
the Human Brain Atlas (*Allan Jones, M.D.*)

July-August

No scheduled Grand Rounds

Neurology for the Non-Neurologist

7:30-8:30 a.m.

Tuesday, May 26 (Swedish Issaquah Campus/ Medical Imaging Waiting Area)

Cerebrovascular Surgery Intracranial Hemorrhage:
Causes and Treatments (*David Newell, M.D.*)

Tuesday, June 23 (Swedish Ballard Campus/ 5 North Classroom)

Advances in Brain Tumor Care
(*John Henson, M.D.*)

Tuesday, July 28 (Swedish First Hill Campus/ 1 South Conference Room)

Back Pain (*Glen David, M.D.*)

Tuesday, Aug. 25 (Swedish Issaquah Campus/ Medical Imaging Waiting Area)

Trigeminal Neuralgia: Surgical Treatment Options
(*Ryder Gwinn, M.D.*)

Tuesday, Sept. 22 (Swedish Ballard Campus/ 5 North Classroom)

Smoking Cessation in the Hospitalized Patient:
Guidelines for Practice (*Michael Fruin, M.N.,
ARNP, FAHA*)

Tuesday, Oct. 27 (Swedish First Hill Campus/ 1 South Conference Room)

Neuropsychological Evaluation: What Is It,
Who Does It, and What Is It Good for?
(*Alan Haltiner, M.D.*)

Tuesday, Nov. 17 (Swedish Issaquah Campus/ Medical Imaging Waiting Area)

Spinal Cord Stimulation: Indications and
Outcomes (*Ryder Gwinn, M.D.*)

Tuesday, Dec. 15 (Swedish Ballard Campus/ 5 North Classroom)

Diagnosis and Treatment of Primary Headache
Disorders (*Sheena Aurora, M.D.*)

Innovation and Technology in Cerebrovascular Disease

Swedish Education & Conference Center,
Cherry Hill Campus

June 18-19

This two-day symposium will provide an update on technological advances for diagnosing, imaging and treating this multifaceted patient population. Workshops on neurovascular ultrasound will focus on established diagnostic techniques, including transcranial Doppler (TCD) imaging and monitoring. Other topics include surgical and endovascular applications, right-to-left cardiac shunts, and neurosurgical applications and interpretations. A conference brochure and registration information is available online at www.swedish.org/CerebrovascularDisease. For more information, call 206-386-2755.

Case Conferences

Swedish Neuroscience Institute Case

Conference: 2nd and 4th Thursdays of each month (except holidays), from 7:30 to 8:30 a.m., Swedish Education and Conference Center, Cherry Hill Campus

Stroke Case Conference: 1st Wednesday of each month (except holidays), from 12 noon to 1 p.m., Locke Conference Room, First Hill Campus

Spine Case Conference: 1st and 3rd Tuesdays of each month (except holidays), from 7 to 8 a.m., Swedish Neuroscience Institute Conference Room (James Tower, 5th Floor), Cherry Hill Campus

Multiple Sclerosis Case Conference: 2nd and 4th Thursdays of each month, from 7:30 to 8:30 a.m., Swedish Neuroscience Institute Conference Room (James Tower 5th Floor), Cherry Hill Campus

Epilepsy Case Conference: Friday of each week (except holidays), from 12 noon to 1 p.m., James Tower Suite 5427, Cherry Hill Campus

For more information or to confirm dates, times, topics or locations, please call 206-386-3170. ❖

SEE REVERSE SIDE FOR SWEDISH NEUROSCIENCE SPECIALISTS LISTING.

Optical Coherence Tomography Provides Insight into MS Disease Progression

EACH YEAR 10,000 AMERICANS ARE NEWLY DIAGNOSED WITH MULTIPLE SCLEROSIS. Acute optic neuritis is a presenting manifestation in 20-40 percent of these patients and eventually occurs in nearly 60 percent of all MS patients, leaving many with optic nerve damage. Optic nerve dysfunction often is evident in MS patients even without a clinical history of optic neuritis.

Neuro-ophthalmologists have historically relied on multiple tests to assess optic nerve function, including visual acuity, contrast sensitivity, color vision, visual fields and visual evoked potential testing. On funduscopic exam, optic discs become pale in up to 76 percent of optic neuritis patients, as well as in visually asymptomatic MS patients. In the last several years, neuro-ophthalmologists have increasingly used optical coherence tomography (OCT) to quantify optic atrophy correlating with optic nerve pallor observed on fundus examination.

OCT uses near-infrared light to produce micron-scale, three-dimensional, high resolution, cross-sectional images of the retina. Since its early development in the late 1990s, ophthalmologists have used OCT as a tool for visualization of macular and other retinal pathologies. Subsequently, neuro-ophthalmologists began using OCT to measure the thickness of the retinal nerve fiber layer (RNFL) of the inner retina around the optic disk as a reflection of the health of the optic nerve. Baseline measurements of RNFL thickness and repeat measurements at various intervals can determine whether progressive optic atrophy is occurring.

The optic nerve (or retinal nerve fiber layer) in the retina is unique in the central nervous system in that axons exist there without myelin. Because the RNFL has no myelin, OCT can be used in MS studies to measure degeneration of optic nerve axons alone. In time, OCT findings may become a purer marker of neuronal degeneration in MS than MRI and clinical measures of disease activity. Researchers seeking new therapeutic strategies in MS may also use OCT technology to monitor neuroprotection and neuroregeneration.

Increasingly, studies are showing that OCT measurements of the RNFL in groups of MS patients correlate with visual function¹, neurologic impairment and disease duration¹, MRI parameters², and type of MS³. OCT is being used in ongoing MS treatment trials to further substantiate the data from these early studies.

As part of a comprehensive program that includes clinical evaluation and MRI, neurologists can use OCT



Neuro-ophthalmologist Steven Hamilton, M.D., discusses real-time OCT results with a patient in the MS Eye Clinic.

MS Eye Clinic

Neuro-ophthalmic Consultants Northwest
1229 Madison St., Suite 615
Seattle, WA 98104
206-386-2700

The neuro-ophthalmology clinic affiliated with the Swedish Neuroscience Institute has a dedicated Multiple Sclerosis Eye Clinic. The clinic provides comprehensive evaluation of the visual health of people with multiple sclerosis, including the use of the state-of-the-art Cirrus™ HD-OCT scanner.

The MS Eye Clinic was established with the support of the Greater Washington Chapter of the National Multiple Sclerosis Society, and Janet Levy Pauli and Bill Pauli.

The clinic's neuro-ophthalmologists are specially trained to assess the visual problems of people with MS, and are involved in numerous clinical studies in the treatment of multiple sclerosis.

Please call 206-386-2700 to consult or refer a patient, or to learn about clinical trials involving OCT.

findings to identify the clinical activity of a patient's MS and determine whether an alteration in disease modifying therapy might be indicated. OCT appears to be a promising tool in studying and following patients with multiple sclerosis because it measures only axonal loss, takes only a few minutes per eye, and costs one tenth as much as an MRI. ❖

Steven R. Hamilton, M.D.

Eugene F. May, M.D.

¹ Fisher JB et al., *Ophthalmology*, 2006, 113:324-332.

² Gordon-Lipkin E et al., *Neurology* 2007, 69:1603-1609.

³ Pulicken M et al., *Neurology* 2007, 69:2085-2092.

Swedish Admissions Call Center Streamlines and Simplifies Patient Transfers

The preliminary diagnosis from the emergency department staff: cerebral aneurysm. The next step the staff takes could make a difference in the patient's outcome. The question: Immediately transport to a medical center emergency department or first make a call?

The Swedish Admissions Call Center – a program designed to quickly get the right patient in the right bed receiving the right care.

Swedish Medical Center's new clinical admissions and placement program has streamlined and simplified the admission process for physicians throughout Washington. A new toll-free telephone number is now available for securing an appropriate bed and for ensuring the receiving staff has the information and orders they need to assume responsibility for the patient's care.

The Swedish Admissions Call Center, staffed by registered nurses, operates seven days a week and 24 hours a day with one goal: quickly connect a referring physician with the appropriate admitting physician and secure an appropriate bed for the patient. The benefit of the new system, however, is not speed alone. Nurses who receive calls also collect important patient information that helps fast track the hand off and ensure the appropriate level of care is in place when the patient arrives at Swedish.

In August 2007 Swedish began a limited implementation of this centralized admission process only for patients requiring heart and vascular or neuroscience services at its Cherry Hill Campus. The call center is

now available to take calls for admissions to all Swedish campuses (Ballard, Cherry Hill and First Hill) and all acute-care specialties.

Whether the patient is in another hospital, emergency department or medical office, the process is quite simple.

- 1) A referring physician calls 866-470-4BED (4233)
- 2) The physician's call connects to a registered nurse who collects basic information:
 - Names and phone numbers of the referring hospital and/or physician
 - Patient's name, age, diagnosis, clinical status, and type of specialty care or service requested
- 3) The nurse pages the appropriate admitting physician at Swedish and facilitates a physician-to-physician phone consult while remaining on the phone to complete the transfer after the patient has been accepted.
- 4) The nurse then assigns an appropriate bed, assists with transfer details and collects additional information needed prior to transfer.
- 5) After the call, the nurse communicates clinical information to the receiving unit staff. If connected to the Swedish EPIC system, the receiving physician can enter admission orders in the electronic medical record to expedite care on admission.

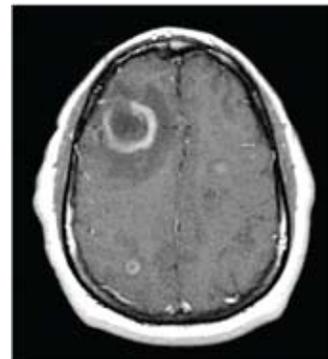
The call center also can facilitate urgent consults to determine the best disposition for a particular patient that may not result in a transfer. ❖

**Swedish Admissions Call Center
866-470-4BED (4233)**

Test Your Knowledge

A 24 year-old Caucasian woman without prior medical illness had subacute onset of headache, confusion and unsteady gait. She complained of mild upper respiratory tract symptoms one week before onset of symptoms, and restorative dental work had been performed two weeks pre-onset. Her temperature was 98.9 degrees F. Neurological examination revealed slowed responses to answers, poor orientation, an upgoing toe on the left and a mildly unsteady gait. CSF showed 60 lymphocytes/mm³ and a total protein of 78 mg/dl. Oligoclonal bands were not present.

Question: What key finding on this gadolinium-enhanced T1-weighted MRI is most consistent with the patient's diagnosis? (For the answer, see page 5.) ❖



Novel Oral Agents for MS Studied at SNI

“Oral medications will be the next leap forward for multiple sclerosis treatments, matching clinical effectiveness with fewer side effects and better patient acceptance.” *James Bowen, M.D., Medical Director, MS Center, Swedish Neuroscience Institute*

Prior to 1993 there were no treatments to slow the progression of multiple sclerosis. Now there are six FDA-approved medications. While this represents tremendous progress, these therapies are limited by

their partial effectiveness, side effects and the need for frequent injections. Fortunately, a new generation of oral medications is being developed, promising better patient acceptance, greater convenience and fewer side effects. Physician researchers at Swedish Neuroscience Institute are studying four oral agents for relapsing/remitting MS, including cladribine (a mild immunosuppressant), fingolimod and BAF-312 (sequester lymphocytes in lymphoid tissues) and CDP323 (blocks lymphocyte

adhesion and migration). These oral agents are expected to dominate the future treatment of MS, gaining wide acceptance with patients and the medical community.

There are currently 22 studies at the MS Center at Swedish, seven of which are now enrolling patients. These studies are among a total of 65 trials available at the institute for a wide range of neurological disorders. For more information, go to www.swedish.org/neuroscience. ❖

AROUND SNI

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World-renown neurosurgeon visits Swedish Neuroscience Institute
Charles B. Wilson, M.D., professor emeritus of neurology and past chairman of the department of neurosurgery at the University of California San Francisco, was the featured speaker at the Jan. 15 Grand Rounds at Swedish Neuroscience Institute. Wilson is pictured here second from the right, with the co-executive directors of SNI Marc Mayberg, M.D., and David Newell, M.D., on the left, and John Henson, M.D., director of neurology and medical director of the Center for Advanced Brain Tumor Treatment on the right. Wilson spoke about the role of neuroscience institutes in advancing research and clinical care. ❖