

NEUROtransmitter

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About Santa Barbara Cottage Hospital and Cottage Health System

The not-for-profit Cottage Health System is the parent organization of Santa Barbara Cottage Hospital (and its associated Cottage Children's Hospital and Cottage Rehabilitation Hospital), Santa Ynez Valley Cottage Hospital and Goleta Valley Cottage Hospital.

The Santa Barbara Neuroscience Institute at Cottage Health System is a physician-led initiative established to focus on medical conditions over the full cycle of care. The Institute aims to deliver the highest value to the patient by incorporating best practices, applying resources judiciously, and measuring and reporting outcomes relentlessly.

On the Cover: The illustration by Josh Emerson depicts the coronal view of a middle cerebral artery infarct.



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Dear Colleagues,

One of the core initiatives of Santa Barbara Neuroscience Institute at Cottage Health System, as previously mentioned in this column, is that of improving measured quality of healthcare delivery, and at a lower total “cycle of care” cost.

Controlling cost is a particularly formidable goal when one is familiar with our healthcare economics; they reveal 20 percent of a given population of patients account for 80 percent of the expenditures and 5 percent for almost half of total expenditures. The U.S. healthcare system seems to be a perfect incubator for unfettered healthcare consumption by these patients, especially those with chronic illnesses. The ingredients for this excessive consumption include the perfect storm of dominance of small group practices, fee-for-service medicine and an unlimited availability of high-technology diagnostic and treatment options. The almost-Brownian motion of patients through our system is the epitome of chaos, and this chaos leads to inefficient and needlessly expensive health care. For example, in one study published in *The New England Journal of Medicine* in 2007, Pham et al. found that the average Medicare patient saw seven different doctors in a year: two different primary care doctors and five different specialists who collectively worked in four different practices. Sicker patients saw far more physicians per year. Most of these physician offices still used paper charts that are relatively inaccessible to other physicians.

In their book *Chaos and Organization in Health Care*, Thomas Lee, MD, and James Mongan, MD, document the current malaise of U.S. health care, examine the reasons and propose changes. They refer to numerous examples of certain provider groups joining together to implement changes in care using a “chronic care model and disease management.” They have both encouraged such changes in their Harvard-affiliated Partners HealthCare System. In the closing pages of their book, they make the statement that “if providers are not part of an organization that can implement systems to improve quality and efficiency, they should join one. If none exists around them, they should form one.” They end the book by stating, “Physicians are not just providers of services to individual patients, but they also should be stewards of the healthcare system itself. As such, physicians have obligations to use resources efficiently, participate in efforts to make health care financially viable, and play their role on teams that coordinate and improve care.”

The SBNI hopes to foster such a system.

Sincerely,

Thomas H. Jones, MD

Neurosurgeon and Medical Director
Santa Barbara Neuroscience Institute

“ The almost-Brownian motion of patients through our [national healthcare] system is the epitome of chaos, and this chaos leads to inefficient and needlessly expensive health care.”



Jodi House—Providing Support for Brain Injury Survivors

Patients with brain injuries have a far better chance of survival than ever before—and must learn to cope with their new reality.

A NONPROFIT, COMMUNITY-BASED organization, Jodi House provides support, solutions and an abundance of resources to survivors of brain injuries and their families, caregivers and friends.

“After a severe brain injury, a person’s No. 1 complaint is loneliness, often ranking above overcoming physical obstacles and pain,” says Kenneth Freeland, executive director of Jodi House. “At Jodi House, survivors rebuild their social networks and participate in activities specifically designed for individuals who are battling the emotional and behavioral changes that come with surviving a brain injury.”

TWO UNIQUE PROGRAMS

A team of occupational therapists, social workers and psychologists medically supervises the **Clubhouse Day Program**, which allows members to pick and choose activities from options such as support groups, adaptive yoga, nonimpact aerobics, musical therapy, games, communication strategies, community outings, and ceramics and other arts and crafts.

“We want Jodi House to be a fun, social interest center where survivors can participate and make new friends,” Mr. Freeland says. “The feedback we’ve received is that participants get that and more—after spending time here, they feel more in control of their lives.”

Jodi Wustman suffered a devastating brain injury in an automobile accident and became increasingly withdrawn due to a lack of support programs. In 1982, her parents and others founded Jodi House to provide patients like Jodi with peer contact and stimulating mental activities.

The **Family and Caregiver Support Program** is a relatively new aspect of Jodi House, explains Mr. Freeland.

“Families are dramatically affected when one of their members suffers a brain injury,” Mr. Freeland says. “We act as a resource to answer questions, give referrals or advice, and also offer the assistance and break time caregivers desperately need.”

To learn more about Jodi House, visit www.JodiHouse.org or call (805) 563-2882.

Cal-Neuro NETWORK

What is the Cal-Neuro Network? The Cal-Neuro Network is a multi-hospital collaborative established by Santa Barbara Cottage Hospital (SBCH) for the care and advanced treatment of neurologic emergencies. As a Certified Stroke Center, SBCH has formed this network to offer its resources to patients and physicians in the surrounding communities and beyond.

Why have a network at all? While the significant investments in neuroscience technology and human resources are not feasible for all hospitals, every patient should have access to the highest levels of care possible.

When do I access the network? It is important to note that the network does not take the place of neuroscience resources in your local hospitals. The network is to be contacted only after consultation with your local on-call neurologist and/or local neurosurgeon.

How do I learn more? Please contact Gary Milgram, Service Line Director at gmilgram@sbch.org or call (805) 682-7111 x82008.

Cal-Neuro NETWORK

Cal-Neuro Network, a multi-hospital collaborative established by Santa Barbara Cottage Hospital

24-HOUR CONSULTATION

Ischemic Stroke,

ICH, SAH, AVM,

brain aneurysm and

other neurovascular

emergencies

Transfer Center:
1-888-MY-CAL-NEURO
(1-888-692-2563)

Novalis Tx™ Enhances Response to AVM

Arteriovenous malformations (AVMs) occur when blood vessels develop incorrectly during fetal growth. Although many symptomatic patients with AVMs can be managed with brain surgery and/or endovascular techniques, state-of-the-art, noninvasive, radiation-based technology now enables physicians to treat some patients with especially challenging conditions.

BRAIN AVM IS TYPICALLY diagnosed after intracranial hemorrhage or seizure. Cerebral arteriograms are the procedure of choice to define the important anatomic relationships of the AVM in order to determine the appropriate treatment. In some cases, endovascular techniques can be utilized to obliterate the AVM. Follow-up arteriograms are then used to confirm whether or not the AVM has been eradicated.

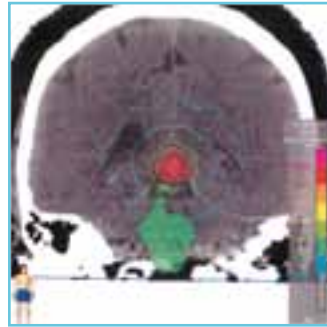
When neither brain microsurgery and/or endovascular obliteration is feasible due to the location, size or complexity of the AVM, stereotactic radiosurgery may offer the best treatment option. In these situations, the Novalis Tx™ radiosurgery system can provide optimal results.

SUCCESSFUL AVM TREATMENT

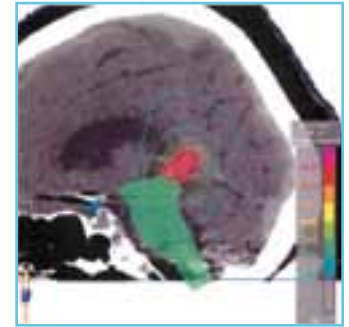
The state-of-the-art Novalis Tx™ at Cancer Center of Santa Barbara—the only system of its kind in the Tri-County area—combines accuracy, power and speed for better patient outcomes. The system captures angiogram images to define the AVM in 3-D perspective.

“Stereotactic techniques enable us to target and deliver a dose of radiation that in most cases is sufficient to destroy the AVM,” says Thomas Weisenburger, MD, FACR, radiation oncologist and medical director of Cancer Center of Santa Barbara. “If left untreated or not completely removed during an initial intervention, an AVM can grow and become more difficult to correct. Novalis Tx™ provides one of the best options to treat vascular lesions located in sites previously considered inaccessible, thus lowering risk for potential future bleeding and subsequent neurological damage.”

For more information about services at Cancer Center of Santa Barbara, visit www.ccsb.org. To refer a patient, call (805) 682-7300.



Coronal view of dose distribution with brainstem pictured in green



Sagittal view of dose distribution with brainstem pictured in green and optic chiasm in blue

FEATURES AND BENEFITS

The noninvasive Novalis Tx™ radiosurgery system can treat many malignancies previously considered inoperable by delivering precise radiation supported by a 2.5 mm HD120® high-definition beam shaper capable of sub-millimeter accuracy.

The precision of the Novalis Tx™ is matched by its power and speed—with up to 1,000 MU per minute dose rate, 6MV and HighX (10-20MV) power, and RapidArc SRS/SBRS speed—resulting in more powerful and effective treatment in a shorter amount of time. This creates a better patient experience.

Imaging capabilities include:

- adaptive gating and robotic couch that move with patient's breathing and correct pitch, roll and yaw positioning
- cone-beam computed tomography including an On-Board Imager® 3-D
- fluoroscopy
- MV Portal Vision™
- stereo X-ray targeting with ExacTrac X-Ray 6D

CASE STUDY: Stereotactic Radiosurgery Resolves AVM

A 71-YEAR-OLD MALE reported to his internist with a chief complaint of intermittent headaches starting in the back of his head and extending to the top. He also reported experiencing some dizziness. Magnetic resonance imaging of the neck showed no remarkable findings. Following magnetic resonance angiography of the brain, a 4mm to 5mm aneurysm in the right anterior communicating artery was discovered.

The patient was then seen by Alois Zauner, MD, neurosurgeon and

neurointerventionalist at Santa Barbara Neuroscience Institute at Cottage Health System. Dr. Zauner confirmed the presence of the aneurysm using cerebral arteriography, which also revealed a small arteriovenous malformation (AVM) involving the vein of Galen.

The aneurysm was repaired, and an attempt was made to treat the AVM angiographically. The tortuosity of the vessels in the region of the AVM restricted catheter access to the feeding vessels, resulting in unsuccessful

angiographic treatment. The patient was subsequently referred for treatment with stereotactic radiosurgery (SRS) and received one treatment session using the Novalis TX™.

Because it takes up to two years for the full effect of SRS to take place, the success of the treatment is usually confirmed by follow-up angiogram at the two-year mark. Fourteen months following treatment, the patient is experiencing reduced incidence of headaches and no bleeding from the AVM.

Treatment Evolution for Emergent Stroke Patients

by Mark Richmond, MD, FACEP, medical director of the department of emergency medicine at Santa Barbara Cottage Hospital

Emergency department stroke management along the Central Coast and Inland regions has been truly revolutionized by the development of the comprehensive Stroke Center at Santa Barbara Cottage Hospital.

IN THE NOT-SO-DISTANT past, the approach to a patient with onset of stroke symptoms less than three hours from the time of presentation was complicated, arduous and anxiety-provoking.

Concerns included medical issues, such as “Will this patient develop an ICH?” and “Is this therapy truly efficacious?” Process issues raised questions, including: “How can I get lab results and a CT scan of the brain completed and read within 45 minutes?” or “Who will assume medical care once the decision has been made to administer t-PA?” and “Will the patient receive proper nursing and ancillary care throughout his/her stay in the hospital and rehab facility?”

Medicolegal questions abounded as well, including concerns of being sued if a patient developed a complication from thrombolytic administration. Even conspiracy theorists held sway that the drug companies had fabricated data to increase the use of an expensive medication.

During the last decade, our system has evolved in such a way that acute stroke patients are treated rapidly and efficiently by practitioners with experience in state-of-the-art modalities. The cornerstone of the comprehensive stroke center is the use of the stroke team.

INDIVIDUALIZED RESPONSE

When a possible stroke patient enters our system, either as a walk-in or via EMS, a stroke team—consisting of an emergency physician, stroke neurologist, internal medicine resident, specially trained nurses and ancillary staff—is immediately mobilized. Each member of the team knows exactly what he or she needs to do to accomplish the team’s immediate goal of administering thrombolytics to patients who may benefit from them.

A neurologist or neurosurgeon specializing in stroke care provides input crucial for individualizing care during the

CASE STUDY: Timely Stroke Response

by Phil Delio, MD, stroke neurologist and Medical Director of the Stroke Service at Santa Barbara Cottage Hospital



Phil Delio, MD

The use of t-PA has gained widespread acceptance as the only FDA-approved therapy for acute ischemic stroke.

UTILIZATION OF t-PA is felt to be one of the prime reasons why stroke has now fallen to the fourth (previously the third) leading cause of death in this country. The following case illustrates the benefits of t-PA when administered in a timely fashion within an organized stroke system of care.

t-PA INTERVENTION

A 78-year-old male with multiple medical problems—including diabetes, hyperlipidemia and strokes in the past thought secondary to a patent foramen ovale status post repair—was admitted after he was evaluated in the emergency department and thought to have an acute stroke.

The patient reported that he had been in his usual state of health and then while at home noticed right arm weakness and speech problems at 9:30 a.m. The patient drove himself right away to the emergency department, asked for help and came in.

The patient was immediately seen by a stroke neurologist, at which time his National Institutes of Health Stroke Scale (NIHSS) score was a 6 with fairly pronounced weakness of the right arm and leg. CT/CTA imaging done urgently within 30 minutes as part of a “stroke protocol activation” did not reveal any large artery occlusion. However, based on the patient’s deficits, t-PA was administered at approximately 11:30 a.m., two hours into his symptom onset. The patient was transferred to the Intensive Care Unit post t-PA administration for close monitoring.

Within the first 24 hours, the patient made a notable recovery in his right-sided motor function. By his second hospital day, his NIHSS score had decreased to 2, with only some mild clumsiness of his right arm and some mild expressive aphasia. His MRI scan showed some small areas of ischemia in the frontal/parietal areas in the left middle cerebral artery territory, likely consistent with an embolic shower. (He was later found to be in atrial fibrillation during his hospitalization.) It was surmised that he likely had an initial MCA branch artery occlusion due to a cardioembolism that likely fragmented after t-PA administration, resulting in smaller, less significant strokes.

He was discharged to home with his wife four days after his initial presentation to the emergency room.

This particular case underscores the importance of the following: firstly, recognition of stroke symptoms by the patient, who sought immediate medical attention when his symptoms first began; and secondly, the rapid triage and assessment of patients within an organized stroke system of care. These elements, when successfully combined, can result in significantly improved outcomes and recovery for stroke patients.

patient’s stay. Specially trained staff members, including representatives of all ancillary services, work to maintain the Cottage commitment to comprehensive care through and beyond discharge.

t-PA POWER

From a medico-legal perspective, data on the administration of t-PA show emergency physicians are more likely to be sued for *not* administering thrombolytics than for giving them. Even the Canadian health system has determined that the administration of thrombolytics to appropriate patients results in improved outcomes and reduced overall cost to their medical system.

No one can deny that outcomes for stroke patients are improved by a comprehensive team approach adhering to national guidelines. Cottage has invested heavily in infrastructure to maintain the high function of our team. We have ongoing educational programs and host an annual, nationally attended conference. We have dedicated physician and nursing leadership and state-of-the-art technology. In addition, as a comprehensive stroke center, we have access to the latest invasive endovascular techniques.

Santa Barbara Cottage Hospital is the only hospital on the Central Coast to be certified by The Joint Commission as a Primary Stroke Center. To learn more, visit www.sbni.org.

ISCHEMIC STROKE TREATMENT—WHEN TIME IS BRAIN

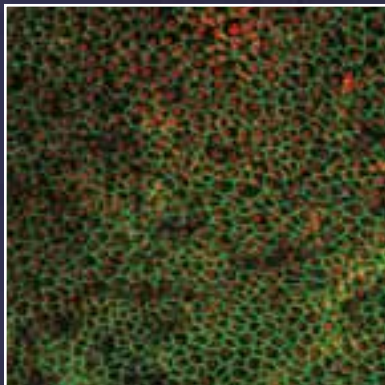
Serious consideration should be given to the transfer of patients who present inside the stroke treatment window. Patients who may benefit from intra-arterial t-PA and/or clot retrieval should be sent to an endovascular neurosurgical program like that at Santa Barbara Cottage Hospital—the only one of its kind on the Central Coast.

Guidelines for ischemic stroke care specify the following timeline:

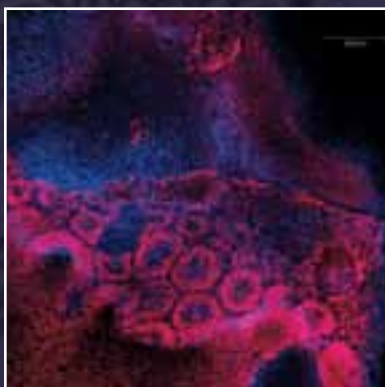
- From onset of symptoms to four and a half hours, consider intravenous t-PA.
- Up to six hours after onset, consider intra-arterial t-PA.
- Up to eight hours after onset, consider clot retrieval.

Ground or helicopter transportation may be used to deliver patients for these time-sensitive treatments.

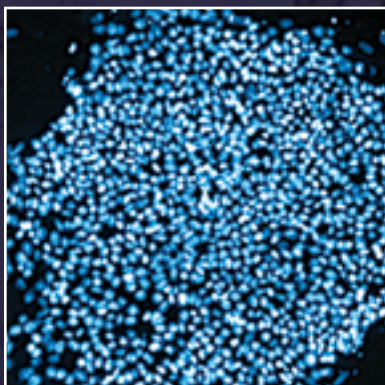
For 24/7 access to the Transfer Center, call 1-888-MY-CALNEURO. Protocols and support materials are available for review at www.sbni.org.



Retinal pigment epithelial cells derived from human embryonic stem cells stained with an antibody to the tight junction protein Zo-1 (in green) and for nuclei (in red). *Photograph by Sherry Hikita*



Early stage retinal cells derived from human embryonic stem cells stained for Pax6 (red) and nuclei (blue). *Photo by David Buchholz*



Human embryonic stem cells grow in "colonies" like the one pictured above. *Photo by David Buchholz*

Stemming Vision Loss With STEM CELL THERAPY: The California Project to Cure Blindness



Dennis Clegg, PhD

Age-related macular degeneration (AMD)—a leading cause of blindness in the elderly—takes a devastating toll on quality of life by robbing those affected of their fine visual acuity in the central visual field.

by Dennis Clegg, PhD, Professor, Department of Molecular, Cellular and Developmental Biology and Co-Director of the University of California Santa Barbara Center for Stem Cell Biology and Engineering

WHILE THE DEVELOPMENT of vascular endothelial growth factor (VEGF) inhibitors has provided an effective therapy for many with the exudative or "wet" form of the disease, this patient population only accounts for approximately 10 percent of those affected. For the majority of patients with the non-exudative or "dry" form, no efficacious treatment exists. Ongoing efforts at the University of California Santa Barbara in collaboration with other institutions are aimed at developing a stem cell-based therapy for dry AMD.

Recent advances in AMD research have shown that loss of vision in most cases is due to the death of the retinal pigmented epithelium (RPE), which in turn gives rise to loss of photoreceptors. The RPE is a pigmented monolayer behind the retina that performs crucial functions that support photoreceptors.

RPE deficits are linked to chronic inflammation and complement attack; accumulation of toxic compounds within RPE; or loss of RPE attachment.

Studies in both rodents and humans have shown that if the diseased RPE can be replaced by healthy tissue, photoreceptors can be preserved. Recent studies have demonstrated that human embryonic stem cells and induced pluripotent stem cells can differentiate into RPE that is functional in animal models.

DEVELOPING CLINICAL APPLICATIONS

The California Project to Cure Blindness is an interdisciplinary research effort involving researchers at UCSB in the Center for the Study of Macular Degeneration and the Center for Stem Cell Biology and Engineering, along with retinal surgeons in the Keck School of Medicine at the University of Southern California (Mark Humayun, principal investigator), materials chemists at Caltech, and experts in cellular therapy from the City of Hope and University College London. The goal is to differentiate a monolayer of RPE on a synthetic substrate that can be implanted in the macula to replace damaged RPE and therefore preserve photoreceptors.

The eye is an excellent candidate for developing such a therapy. It is accessible via well-developed surgical methods, and excellent methods can be utilized for noninvasive imaging and assessment of endpoint parameters to measure visual acuity. Furthermore, relatively few cells are necessary to cover the macular region.

To successfully move stem cell research from the laboratory to the clinic will require standardized production of a reliable RPE graft with proven efficacy in animal models. Despite the many challenges associated with developing such a novel therapy, the interdisciplinary team, with funding from the California Institute for Regenerative Medicine, has a goal of filing an investigational new drug application with the FDA within four years. The hope is to perfect this new technology to alleviate suffering for the millions of people affected by dry AMD.

To learn more about the work of The California Project to Cure Blindness to prevent vision loss and improve the quality of life for those suffering from age-related macular degeneration, visit www.thecaliforniaproject.org.

Hope and Possibility Through Rehabilitation

Trisha Meili first made headlines after she was brutally attacked while jogging in April 1989. Initially identified only as the Central Park Jogger, Ms. Meili is today a motivational speaker who delivers a message of hope and insight about traumatic brain injury (TBI) and empowerment through rehabilitation.

THE AUTHOR OF a book about her experience titled *I Am the Central Park Jogger: A Story of Hope and Possibility*, Ms. Meili now describes her rehabilitation as a beginning of the process to recovery and reclaiming her life. On May 16, 2011, she will be the featured speaker in a public lecture sponsored by the Rehabilitation Hospital Foundation.

Following her attack, Ms. Meili experienced 75 percent blood loss and TBI that left her in a coma. While she was able to return to work on a limited basis eight months after the event, her recovery process still continues today, more than 20 years later.

“The kind of rehabilitation Ms. Meili underwent includes a thorough evaluation of cognitive and speech processes and concentrates treatment on affected abilities,” says Tom Reeg, administrator of the Cottage Rehabilitation Hospital Foundation. “We can think of few better people to provide the patient’s perspective about the topic of TBI and rehabilitation. This lecture is the third in the Foundation’s Empowerment Through Medical Rehabilitation educational series, which features presentations by exceptional people about the empowering effects of medical rehabilitation.”

Past presenters have included Jill Bolte Taylor, PhD, author of *My Stroke of Insight*, and Hans S. Keirstead, PhD, professor and stem cell research pioneer.

“ We can think of few better people [than speaker Trish Meili, the Central Park Jogger] to provide the patient’s perspective about the topic of traumatic brain injury and rehabilitation. ”

— Tom Reeg, administrator,
Rehabilitation Hospital Foundation

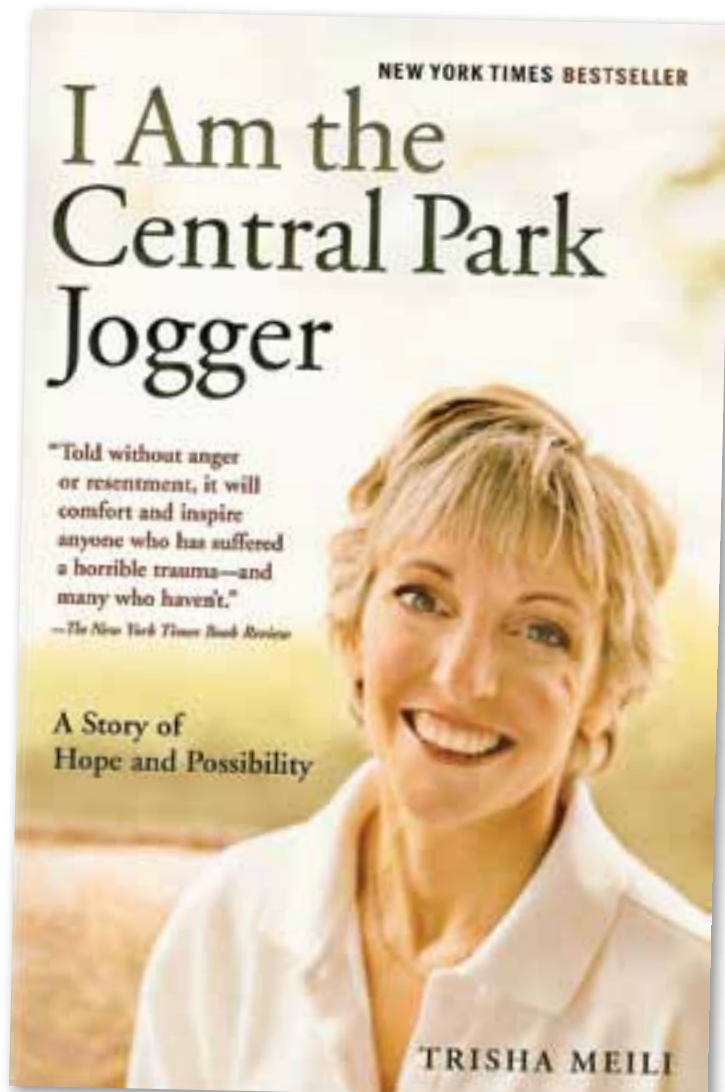
EXPERTS SPEAK OUT

A panel discussion involving a neuropsychologist, a psychiatrist, a family member of a person with TBI, and an expert on violent crime and sexual assault will follow Ms. Meili’s presentation. In addition to presenting the psycho-social aspects of rehabilitation from TBI, the event will highlight advanced medical therapies for TBI at the Santa Barbara Cottage Hospital level II trauma center and at Cottage Rehabilitation Hospital.

“All medical care providers can greatly benefit from hearing directly about patient experiences like Ms. Meili’s,” says Mr. Reeg. “Knowing this perspective helps providers continue to improve the quality of treatment and care they deliver.”

Trisha Meili, author of *I Am the Central Park Jogger: A Story of Hope and Possibility*, will be the featured presenter at the next Rehabilitation Hospital Foundation Empowerment Through Rehabilitation Lecture Series, to be held on Monday, May 16, at Fess Parker’s DoubleTree Resort, 633 East Cabrillo Blvd. in Santa Barbara. A panel discussion will follow. The presentation will be followed by an optional dinner and panel discussion.

Register online at www.rehabilitationhospitalfoundation.eventbrite.com.



Peripheral Neuropathy: A Diagnostic Case Study



Hsien Young, MD

by Hsien Young, MD, neurologist, neurophysiologist and sleep medicine specialist at Santa Barbara Neuroscience Institute at Cottage Health System

DIAGNOSING PERIPHERAL NEUROPATHIES can be an intimidating, confusing and costly process. Focused history-taking and a thorough neurological exam—with attention to the pattern of involvement and time course of symptoms—narrows the differential diagnosis, helps focus evaluation and expedites treatment. A systemic

approach using an algorithm can be very helpful. A peripheral nerve algorithm based on key elements of history and physical examination helps focus workup and evaluation of any patient with neuropathy complaints and suggests the timing of neurological consultation.

Peripheral neuropathies are disease processes that affect any region of the peripheral nervous system, including the cranial nerves, the spinal nerve roots, the dorsal root ganglia, and the peripheral nerve trunks and their terminal branches. Nerve cells are composed of cell bodies and axons. The axons can be large myelinated, small myelinated or small unmyelinated. The most common neuropathies are those involving small myelinated and unmyelinated fiber types and are called small-fiber neuropathies.

FACTORS IN DIAGNOSIS

The workup of peripheral neuropathy should focus on three key points: 1) sensory and/or motor involvement; 2) symmetry; and 3) temporal progression. Motor weakness and cranial nerve involvement often indicate malignant disease. When present, early neurological consultation is always recommended.

CASE STUDY: Peripheral Neuropathy

A 58-YEAR-OLD OVERWEIGHT male with a history of borderline diabetes and mild carpal tunnel syndrome presented to his family doctor with increasing numbness and tingling of his hands. He was noted to have had flu-like symptoms with diarrhea two weeks earlier, which had since been resolved. The patient was suspected of having carpal tunnel syndrome exacerbation and was sent home with new wrist splints.

Two days later, the patient complained to his wife that his feet were tingling and slightly numb. The following day, while walking on the beach with his wife, the patient fell multiple

times. He was unable to finish this exercise, which had to that point been part of the couple's daily routine. His wife called their family doctor, who advised them to go to the emergency room immediately.

In the ER, the patient was found to have weakness in all extremities, absent of reflexes, with patchy distal sensory deficits. Neurology consultation confirmed the ER physician's findings with high suspicion of Guillain-Barré syndrome (GBS). Lumbar puncture, cerebrospinal fluid (CSF) examination, was ordered after computed tomography scan confirmed it was safe to proceed.

CSF protein was 157, supporting the diagnosis of GBS.

The patient was admitted to the hospital and started on intravenous immunoglobulin (IVIG) treatment. The following day, nerve conduction studies confirmed asymmetrical sensory motor neuropathy consistent with a diagnosis of GBS.

Over the next week, the patient received four more IVIG treatments. He had steady recovery with improved nerve conduction study results. He required intensive rehabilitation, with physical and occupational therapy, over three months, resulting in full recovery of neurological function.

“ The workup of peripheral neuropathy should focus on three key points: 1) sensory and/or motor involvement; 2) symmetry; and 3) temporal progression.”

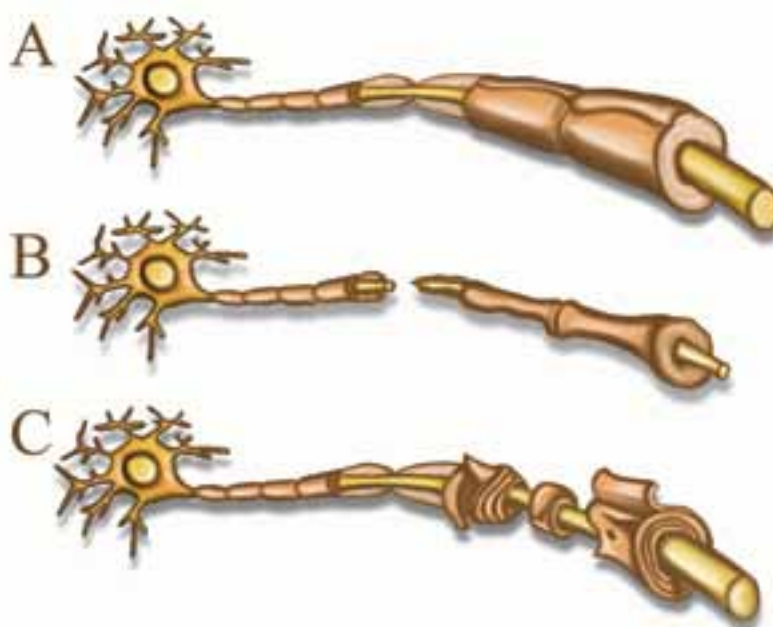
—Hsien Young, MD, neurologist, neurophysiologist and sleep medicine specialist at Santa Barbara Neuroscience Institute at Cottage Health System

The most common neuropathies, such as diabetic neuropathy, are often symmetrical. Asymmetric neuropathies include common compressive neuropathies such as carpal tunnel syndrome. When the neuropathy is symmetrical, a proximal versus distal pattern becomes important. Toxic and metabolic neuropathies usually present with symmetrical and distal symptoms. Proximal sensory neuropathies are very rare, with porphyria as the main differential. Predominantly motor neuropathies, including Guillain-Barré syndrome, are often proximal.

PROGNOSIS

The temporal course of a neuropathy varies widely based on the etiology. With trauma or ischemia, the onset is acute, with maximum symptoms at onset. Inflammatory and some metabolic neuropathies have a subacute course extending over days to weeks. A more chronic course over weeks to months is the hallmark of most toxic and metabolic neuropathies. The very slowly progressive neuropathy over many years is the usual pattern of hereditary neuropathies or of chronic inflammatory demyelinating polyneuropathy.

The clinical assessment should include a detailed medical history. Many systemic diseases, such as diabetes or hypothyroidism, can be associated with neuropathy. Many medications can cause a peripheral neuropathy. Social history regarding illegal drugs, alcohol, exposures to heavy metals, chemicals, solvents, HIV risk, travel involving potential exposure to leprosy or Lyme disease, dietary nutritional deficit, and vitamin use (such as megadoses of vitamin B) should be documented. A detailed family history should include inquiries as to the presence of hammertoes, high arches, weak ankles and gait abnormalities in immediate and extended family members.



[A] Normal. [B] Axonal neuropathy. [C] Demyelinating neuropathy.

POSSIBLE CAUSES

Peripheral neuropathy has a dizzying array of causes, including hereditary, toxic, metabolic, infection, inflammatory, ischemic, trauma and paraneoplastic disorders. The use of an algorithm can help the busy practitioner navigate the diagnostic process by identifying a pattern in the patient's history and examination results and then including or excluding diagnostic possibilities based on clinical knowledge and training.

To learn more about diagnostic services at Santa Barbara Neuroscience Institute at Cottage Health System and/or to download a copy of the clinical algorithms that support this article, visit www.sbni.org.



Santa Barbara Cottage Hospital
Pueblo at Bath Street
P.O. Box 689
Santa Barbara, CA 93102-0689

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On behalf of
Cottage Health
System, you are
cordially invited
to attend



saving the brain

The 4th Annual Neuroscience Symposium of the Central Coast
featuring nationally recognized guest speakers, along with experts
in the Neurosciences from Santa Barbara Cottage Hospital

Saturday, September 24, 2011

7:15 AM to 4:15 PM

Fess Parker's DoubleTree Resort

633 East Cabrillo Boulevard

Santa Barbara, CA 93103

save the date

For content review of previous conferences go to
www.sbni.org or email sbni@sbch.org