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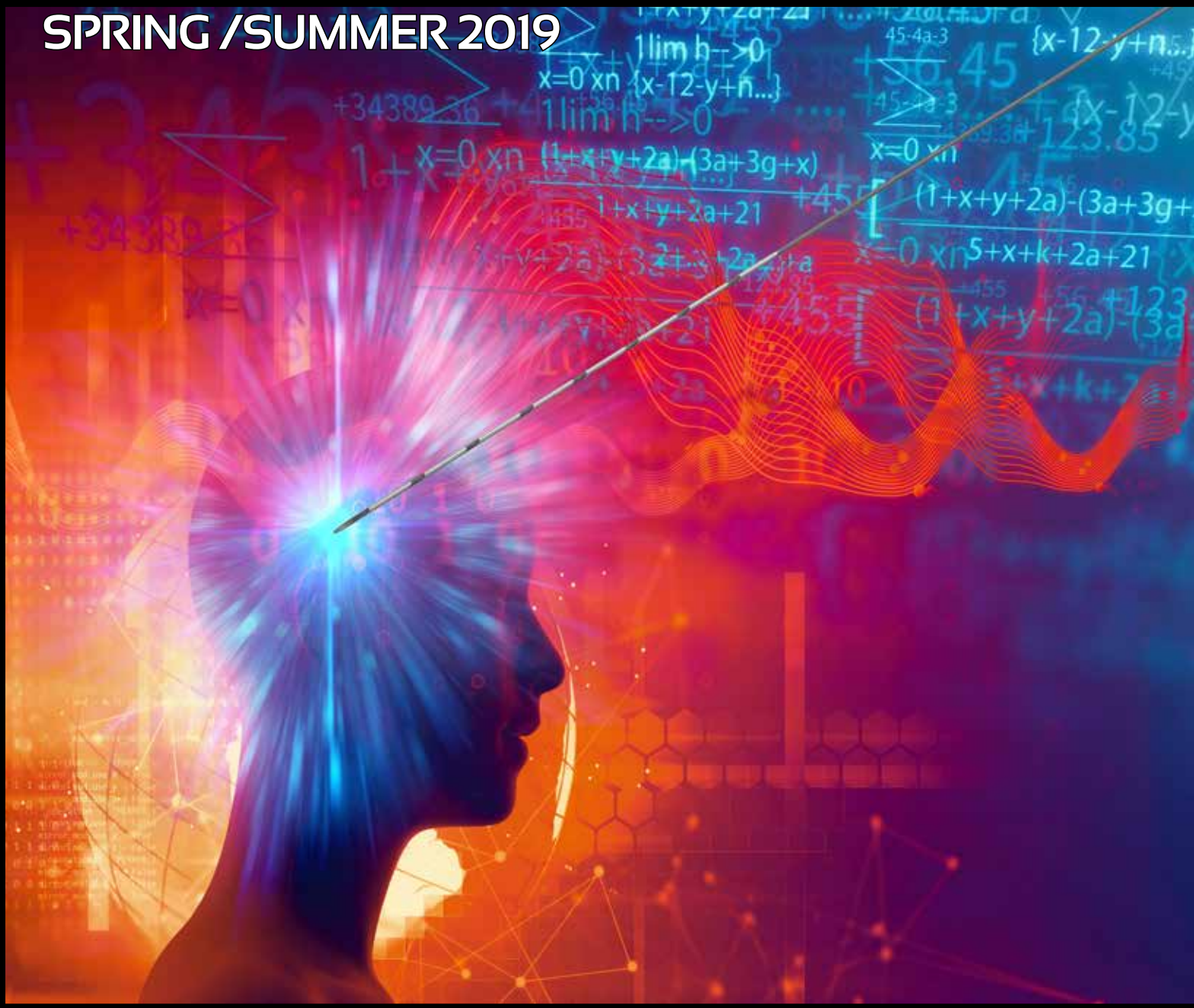
ALACHUA COUNTY MEDICAL SOCIETY

HouseCalls

SPRING /SUMMER 2019



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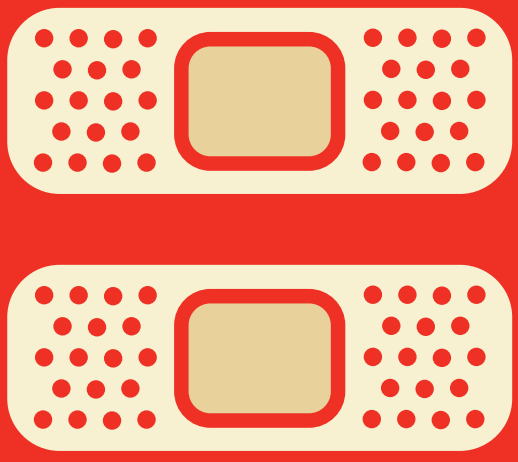

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Contribute to the Robb House Endowment Fund

ROBB HOUSE MEDICAL MUSEUM

This Victorian cottage built in 1878 became the home and medical office of doctors Sarah Lucretia and Robert Robb. Sarah Lucretia was the first woman physician in Alachua County. She practiced medicine from 1884 to 1917.

A special thank you to Drs. Scott Medley, Orvin Jenkins, and John Andrews for contributing a total of $2,000 in the first quarter of 2019! This year, we are seeking funds to replace the roof. The front porch steps and handrails have recently been replaced and are about to be painted. All contributions are tax deductible. Please donate today!

Robb House Endowment Improvements To Date:

- Roof Patching
- Carpet Replacement
- Paint Interior/Exterior
- Electrical Work
- Foundation Insulation Replacement and Repair
- Porch Steps/Deck Repair and Carpentry Work
- A/C Repairs
- Tree Removal

Robb House Endowment Donors

A Special Thank You to our Generous Donors below!

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CONTENTS

Featured Articles

Medical Community

CONTRIBUTING AUTHORS

Duane Mitchell, MD

UF Health Neurosurgery

Dr. Mitchell holds patents related to brain tumor immunotherapy that have been licensed by Celldex Therapeutics, Inc., Annias Immunotherapeutics, Inc., and Immunomic Therapeutics, Inc. He is the co-founder of iOncologi, Inc., a biotechnology company focused on cancer immunotherapy treatment. . He serves as an advisor for Bristol-Myers Squibb, Inc., Tocagen, Inc., and Oncorus, Inc. He receives funding from the National Cancer Institute, Department of Defense, and several private foundations focused on brain tumor research and treatment.

Anthony Ackerman, MD, PHD

SimedHealth Neurology

Dr. Ackerman, earned a Ph.D. in Zoology and his medical degree at Michigan State University. He completed his Neurology residency at the University of Iowa where he also completed a Fellowship in Sleep Medicine. Dr. Ackerman is Board Certified in Neurology and Board Certified in Sleep Medicine. He currently practices at SIMEDHealth Neurology in Gainesville, Florida.

Kelly Foote, MD

UF Health Neurosurgery

Dr. Foote graduated from the University of Utah College of Medicine in 1995, where he was honored with the Florence M. Strong award in recognition of his outstanding qualities as a physician dedicated to patients. Dr. Foote joined the University of Florida neurosurgery faculty in July 2002, where he has performed over 850 deep brain stimulator implantations. Dr. Foote has received numerous honors and awards, including Phi Beta Kappa, Alpha Omega Alpha, the Congress of Neurological Surgeons' Resident Award, and the Chuck Shank Award (for excellence in neurosurgery). He has been recognized consistently among the "Best Doctors in America" and "America's Top Surgeons" and he has served on the Board of Directors of the American Society for Stereotactic and Functional Neurosurgery.

Scott Medley, MD

Retired Family Physician

After graduating from the University of Kentucky College of Medicine, Dr. Scott Medley served in the U.S. Army, completing his Residency in Family Medicine and attaining the rank of Major. He entered Private Practice in Gainesville, establishing Gainesville Family Physicians. After 20 years in Private Practice, Dr. Medley became a Hospitalist and later acted as Chief Medical Officer at NFRMC. He served as President of the ACMS and of the Florida Academy of Family Physicians. He was given the Gainesville Sun Community Service Award in 1987 and was chosen Florida Family Physician of the Year in 1992. He currently is retired and volunteers at Haven Hospice. Dr. Medley has served as Executive Editor of *House Calls* for the past 21 years, and has authored over 90 editorials and articles for this publication.

CONTRIBUTING AUTHORS

William F. Hamilton, MD

Chief Medical Examiner at District Eight

Dr. Hamilton has been the chief medical examiner at the Office of the District Eight Medical Examiner, serving seven counties in North Central Florida, since 1981. He also provides surgical pathology and cytology diagnostic services at UF Health Shands Hospital and UF Health Pathology Laboratories.

Dr. Hamilton is involved in teaching forensic pathology and related topics in forensic science to medical students and residents and provides frequent medicolegal consultations for officials of the courts, as well as for law enforcement and public health agencies.

Sasha Vaziri, MD

UF Health Neurosurgery

Dr. Vaziri graduated from the University of Florida medical school where he was actively involved in clinical research and quality improvement initiatives. He graduated in 2015 with Honors in Research and was presented the Excellence in Neurosurgery Award at the UF Senior Awards Banquet. Dr. Vaziri began his neurosurgical training at UF in 2015 and is scheduled to complete the program in 2022. His research interests in neurosurgery are broad. Three times a gator, in his spare time Sasha enjoys team sports, traveling, barbeque and gator football.

William Carlton, MD

UF Health Neurosurgery

Dr. Carlton completed his undergraduate education at the Virginia Military Institute. In April 2010, he was commissioned into the United States Army as a Second Lieutenant in the Medical Service Corps. He attended Wake Forest University School of Medicine in Winston-Salem, NC. In May 2014, he was promoted to the rank of Captain. He was then stationed in Gainesville to pursue active duty training in neurosurgery at the University of Florida. He is scheduled to complete his training in 2021.

Grace Thompson

University of Florida Medical Student

Grace Thompson is in her second year of medical school at the University of Florida College of Medicine. She was born and raised in Gainesville and attended the University of North Carolina for her undergraduate degree, receiving a BA in Economics. She is very grateful to be a part of the Equal Access Clinic Network and hopes to continue to work with underserved patient populations in her career as a physician.

Justin Yancey, MD

SimedHealth Neurology

Dr. Yancey earned his medical degree from the University of Alabama School of Medicine. He completed his residency in Neurology and Fellowship in Movement Disorders at the University of Florida. Dr. Yancey is Board Certified in Neurology and is currently practicing at SIMEDHealth Neurology in Gainesville, Florida.

From the President's Desk

Matheen Khuddus, MD, ACMS President and
Guest Author Scott Medley, MD,
HOUSE CALLS Executive Editor

STROKE PREVENTION IN ATRIAL FIBRILLATION---

A Patient's Experience With the "DOACs"

Our president, Dr. Matheen Khuddus thought it might be helpful for me to tell you about my experience with drugs for the prevention of stroke in atrial fibrillation.

This "Neurology" issue of HOUSE CALLS gave me an opportunity to relay my personal experience with my efforts to prevent an embolic stroke, one of the most common and most devastating complications of atrial fibrillation. Atrial fib is the most common cardiac arrhythmia in the U.S., affecting millions of people. Dr. Khuddus has asked me to tell you my true story about my "trip around the DOACs", currently the most popular drugs to prevent stroke.

I have had asymptomatic paroxysmal atrial fibrillation for years. About two years ago, this spontaneously converted to permanent atrial fib. My heart rate was controlled well with Diltiazem ER, 180 mg. per day. My Cardiologist and I made the shared decision (he's very good about letting me have input into our treatment decisions) to begin an anticoagulant for stroke prevention.

We decided to avoid the hassles of drug level monitoring and diet restrictions with Coumadin (Warfarin) and instead to start what was then known as a NOAC (Novel Oral Anticoagulant) drug. I guess the drugs aren't as "Novel" now, since they're called DOAC (Direct Oral Anticoagulant) drugs. Together we chose Xarelto (rivaroxaban) 20 mg. per day with the evening meal. I am insured with Medicare and a good supplement, so my out-of-pocket cost for a 90-day supply of this drug was $141. But I am quite active, cycling and doing other outdoor activities, so we decided to switch to Pradaxa (dabigatran) 150 mg. twice a day, with food and lots of water, because there was now a specific antidote, Praxbind (idarucizumab) for Pradaxa in case I had an accident causing uncontrolled bleeding or required anticoagulant reversal for emergency surgery. Two problems with Pradaxa: The cost to me of a 90-day supply was $583 and I really did have to take it with food and large quantities of water to avoid "heartburn" symptoms. (The cost of Praxbind reversal would have been about $5,000 or more).

Then I was informed by some Pharmacist friends at NFRMC that Prothrombin Complex Concentrate (PCC) (Kcentra) is quite effective for reversing Xarelto and Eliquis (apixaban). So my Cardiologist and I then decided to switch to Eliquis 5 mg. twice a day, with or without food, and at a cost of "only" $139 for a 90-day supply. I remain on Eliquis now and am quite happy with it. (There is now a specific antidote for Xarelto and Eliquis –andexanet (Andexxa), but it is new on the market, and also very expensive.) So for now, at least, I'll stick with Eliquis, and try not to have an accident or a bleeding episode!

The ACMS Alliance: Together They Have Built a Healthier Community

Jackie Owens, ACMS Executive Vice President

The Alachua County Medical Alliance (Alliance) is a charitable organization that was formed in 1926 as the Alachua County Medical Auxiliary, supporting the well-being of our community and the physicians that practice there. In the 93 years since their inception, they have advanced many health-related civic endeavors and community projects, establishing a role in health care before the advent of health-related charitable organizations and public health departments.

The organization was established by the spouses of physicians, and was originally open to only female members. Membership was extended to men in 1976-77, as more women physicians were entering the field. Today, membership is open to all spouses and supporting partners of physicians.

Over the years, the Alliance has promoted health projects such as childbirth classes, convalescent nursing, health care days, drug abuse courses, health seminars, sex education, care for the aged, water safety, baby-sitting certification, vision screening, weekly wellness walks, women's health issues, and has raised funds to help those in need. They have recently made an $8,000 contribution to the Robb House for necessary improvements in order to maintain the medical museum. In conjunction with the Florida Medical Association Alliance (FMA Alliance), the Alliance founded the Professional Resource Network (PRN), and the Good Government Lunch and Days in Tallahassee. They have also successfully lobbied to pass legislation to include child safety restraints in cars, no smoking in restaurants, and the requirement that all school districts offer Kindergarten programs.

Two past Alliance members have served as state President of the FMA Alliance, including Anna Bears Lassiter and Marion Gilliland. Below is a chart of all the women serving as President of the Alachua County Medical Society Alliance over the years:

Alachua County Medical Alliance Past Presidents**

1936-37	Ellen Andrews (Edwin H. Andrews)	1979	Janet Rooks (James Rooks)
1937-38	Anna Bears Lassiter (Wilburn Lassiter)	1980	Margaret Gibbs (Charles Gibbs)
1938-39	Flora Tillman (George Tillman)	1980-81	Barbara Moore (Thomas Moore)
1939-40	Florence Smith (DeWitt Smith)	1981-82	Jeannine Hogue (Robert Hogue)
1940-41	Florence Smith	1982-83	Cathy Jenkins (D. Orvin Jenkins)
1941-42	Mary Bell Snow (Thomas Snow)	1983-84	Mary Lou Hawkins (Thomas Hawkins)
1942-43	Jane Maines (John E. Maines, Jr.)	1984-85	Billie Mauldin (Ronald Mauldin)
1943-44	Jane Maines	1985-86	Lou DeLaney (Allen DeLaney)
1944-45	Flora Tillman	1986-87	Donna Boyle (John Boyle)
1945-46	Mary Bell Snow	1987-88	Sally Hadley (Bill Hadley)
1946-47	Anna Bears Lassiter	1988-89	Judy Erickson (Robert Erickson)
1947-48	Jane Maines	1989-90	Joan Schoeffel (Michael Schoeffel)
1948-49	Lou Bell (Emory Bell)	1990-91	Judy Lukowski (Michael Lukowski)
1949-50	Louisa Babers (Henry Babers)	1991-92	Ginny Cauthen (Joseph Cauthen)
1950-51	Catherine Murphree (Walter Murphree)	1992-93	Theresa Wesly (Robert Wesly)
1951-52	Bertha Mae Putnam (George Putnam)	1993-94	Sharon Shahan (John Shahan)
1952-53	Evelyn Love (Albert Love)	1994-95	Cherise Bartley (Rogers Bartley)
1953-54	Elizabeth McClamroch (James McClamroch)	1995-96	Roslyn Levy (Norman Levy)
1954-55	Ouida Love (Cecil Love)	1996-97	Jennifer N.S. Scott (Eric Scott)
1955-56	Pat Summerlin (Glenn Summerlin)	1997-98	Mary Frances Gainer (James Gainer)
1956-57	Rachel E. Emmel (G.L. Emmel)	1998-99	Cherise Bartley
1957-58	Margo DeLaney (Allen DeLaney)	1999-2000	Jane Snyder (Jeffrey Snyder)
1958-59	Mabel Kokomoor (Marvin Kokomoor)	1999-2000	Kim Nesmith (Richard Nesmith)
1959-60	Tony Fitzpatrick (R.J. Fitzpatrick)	2000-01	Marybeth Syfert (Dale Syfert)
1960-61	Marion Gilliland (Charles Gilliland)	2001-02	Marybeth Syfert
1961-62	Gretchen Brill (Tom Brill)	2002-03	Marybeth Syfert
1962-63	Glenna Brashear (Billy Brashear)	2003-04	Shannon Ashley (Robert Ashley)
1963-64	Florence Van Arnam (Carleton Van Arnam)	2004-05	Marybeth Syfert
1964-65	Shirley Williams (Robert Williams)	2005-06	Marybeth Syfert
1965-66	Shirley Williams	2006-07	Marybeth Syfert
1966-67	Shirley Williams	2007-08	Libby Furlow (Leonard Furlow)
1967-68	Jackie Singleton (George Singleton)	2008-09	Margaret Gilliland (Herb Gilliland)
1968-69	Mary Walker (Harry Walker)	2009-10	Margaret Gilliland
1969-70	Millie Evans (William Evans)	2010-11	Margaret Gilliland
1970-71	Carol Crevasse (Lemar Crevasse)	2011-12	Nancy Ross (John Ross)
1971-72	Marianne Robbins (James Robbins)	2012-13	Barbara Kirby (Taylor H. Kirby)
1972-73	Peg Lyons (Henry Lyons)	2013-14	Roslyn Levy
1973-74	Kay Casey (Ernest Casey)	2014-15	Roslyn Levy
1974-75	Barbara Agee (O. Frank Agee)	2015-16	Arlene Colon (John Colon)
1975-76	Peg Garlington (James Garlington)	2016-17	Arlene Colon
1976-77	Alice Talbert (James Talbert)	2017-18	Arlene Colon
1977-78	Audrey Scheibler (Gerold Scheibler)	2018-19	Arlene Colon
1978-79	Ann Marie Mauceri (Arthur Mauceri)		

** ( ) indicates physician spouse; No records are available on Presidents from 1926-35

We'd like to thank all the Alliance members for their ongoing contributions to the community, and for their compassion and caring nature for their fellow man and for the medical profession.

Common Headache Management Strategies

Anthony Ackerman, MD, PhD
SIMEDHealth Neurology

Headaches are a common complaint seen in primary care, urgent care and neurology clinics. They can be debilitating, leading to decreased quality of life, decreased work place productivity and decreased quality time spent with family and friends. This article will focus on the most commonly used treatments and management strategies of the more common headaches seen by non-neurologists --migraines and new onset/ tension headaches. If at any time the patient develops sudden onset of the worst headache of his/her life (e.g., thunderclap headache) or headache with associated slurred speech, language/coordination impairment or unilateral weakness or sensory loss, immediate medical intervention would be highly advisable in order to rule out potentially life threatening processes such as subarachnoid/intracranial hemorrhage or ischemic stroke.

There are two basic approaches to managing headaches, abortive and prophylactic medications.

Headache abortive therapy

An abortive therapy is used to treat the acute onset of a headache with the goal to relieve the headache within minutes to hours. There are several , common over-the-counter headache abortives including: acetaminophen, NSAIDs (e.g., aspirin, ibuprofen, naproxen), and aspirin/ acetaminophen/caffeine preparations. Commonly used prescription abortive medications include:

1) NSAIDs (e.g., diclofenac, high dose ibuprofen), which are commonly paired with prochlorperazine if there is also nausea (+/- diphenhydramine);

2) indomethacin (for indomethacin-responsive headaches, such as hemicrania continua);

3) triptans (e.g., sumatriptan, rizatriptan, eletriptan, zolmitriptan), isometheptene and dihydroergotamine (DHE) for migraines headaches (generally avoid triptans and ergotamine in patients over 50 years of age, but especially in patients with cardiovascular/ cerebrovascular disease);

4) isometheptene (e.g., Midrin).

In-office intramuscular ketorolac injection combined with a short burst and taper (approximately six days) of prednisone can be effective for short-term abortive therapy for an intractable headache and may reduce the need for patients to seek care in urgent care or emergency rooms. Some physicians prescribe barbiturates (e.g., butalbital-containing products) and/or opiates (e.g., hydrocodone, oxycodone, butorphanol, tramadol) for headache abortive therapy. These may temporarily provide symptom relief, however, the potential risks of abuse, dependency, tolerance and rebound far outweigh the potential benefit. ***Since there are many effective headache/migraine abortive therapies available, it is highly advised in recommendations published by the American Association of Neurology (February 21, 2013) that physicians avoid prescribing barbiturates and opiates, especially for first-line therapy and only use as a last resort.***

It has been show n that frequent use of opioid and/ or butalbital treatments can worsen headaches. If any headache abortive, whether over-the-counter or prescription medication, is used more than 2-3 days out of a week, the patient will be at high risk of developing medication overuse/rebound headaches, leading to intractable headaches that will continue to recur as long as the offending medication is taken. The fastest means of breaking the cycle of rebound is to stop the medication "cold turkey," at which time the headache will worsen before it improves, typically over a period of a week. The patient who is unable to stop abruptly may consider tapering off the medication, although this may delay the recovery. A six-day burst and taper of prednisone can frequently reduce the discomfort during withdrawal of the overused analgesic. Patients who are unable to stop taking daily analgesics or who have intractable headaches may benefit from intravenous headache abortive therapy, including DHE, chlorpromazine, valproic acid and dexamethasone.

Headache prophylaxis (preventative) therapy

Individuals with more than two or three headaches per month or with post- concussion headaches may benefit from a medication that is taken on a daily basis. This type of medication does not relieve or improve headaches immediately, but rather over 3 to 4 weeks after their initiation. The majority of these medications were developed for other indications; however, they were found to be highly beneficial for individuals with migraines and other headache types. The selection

Continued on Page 9

HEADACHE MANAGEMENT

Continued from Page 8

of the medication depends on the potential side effect profile and the patient's comorbidities. Commonly used prescription prophylactic medications include:

1) Antihypertensives, including beta blockers (e.g., propranolol, metoprolol, atenolol) and calcium channel blockers (e.g., verapamil, amlodipine). The calcium channel blockers can be effective for cluster headaches, however avoid this class in individuals with comorbid hypotension, bradycardia or cardiac conduction blocks.

2) Antidepressants, including the tricyclics (e.g., amitriptyline, nortriptyline) and the selective serotonergic reuptake inhibitors and serotonin/norepinephrine reuptake inhibitors (SSRI/SNRI) (e.g., fluoxetine, duloxetine). These medications can be helpful in patients with comorbid depression/anxiety (without mania). Tricyclics may be beneficial in patients with comorbid insomnia and tricyclics and duloxetine may beneficial in patients with comorbid pain issues (neuropathy, neck/back pain, fibromyalgia and even arthritis). Avoid this class in individuals with suicidal tendency (tricyclics) and liver disease.

3) Antiepileptics, including valproic acid, gabapentin and topiramate. Use of valproic acid is limited due to potential facial hair growth in women, weight gain and osteoporosis/osteopenia. Gabapentin may be useful for comorbid pain issues but can have associated weight gain and peripheral edema. Topiramate, when used in high doses, may be effective for cluster headaches, however it may have associated appetite suppression, gradual weight loss, and paresthesias, cognitive impairment, risk of kidney stones, glaucoma, alteration of taste, decreasing effectiveness of oral birth control and has a class D pregnancy rating with birth defects reported in approximately 5% of pregnancies.

4) Botulinum toxin (e.g., Botox), which consists of a protocol of 31 injections across the forehead, temples, posterior head/neck and shoulder regions, repeated every 90 days; potential risks include temporary paralysis, eyelid droop, severe dysphasia or respiratory compromise. Botox is contraindicated in patients with neuromuscular disease, motor neuron disease or infection in the area where injected. Coverage could be limited by insurance and commonly requires the headache to be limited to 4 or more hours duration, less than 50% of days of the month headache-free, and require documented failure of several of the oral prophylactic medications.

5) Calcitonin gene-related peptide (cGRP) receptor blocker, including erenumab-aooe (Aimovig) and fremanezumab-vfrm (Ajovy). cGRP blockers are administered subcutaneously once a month and are very well tolerated with few side effects outside of injection site irritation. Coverage could be limited by insurance and is also limited to headaches of 4 or more hours duration, less than 50% of days of the month headache-free, and require documented failure of several of the oral prophylactic medications.

In pregnancy, prophylaxis selection is greatly limited as most of these medications have been designated as Class C or Class D pregnancy risk. Most obstetricians in our area have recommended against use of these medications.

Patients frequently request nonprescription medications to prevent their headaches. The following over-the-counter medications have been shown to be effective in some individuals: magnesium, vitamin B2 (riboflavin), melatonin (10-12 mg at bedtime), butterbur 75 mg twice a day, CoQ10 and feverfew. Non-pharmacologic interventions include sufficient restorative sleep, stress reduction, compresses, distraction therapy and physical/massage therapy.

Diagnostic approach

For persistent, recurrent, or thunderclap headaches it is advisable to obtain imaging to search for serious etiologies for the headache, including cerebral hemorrhage, tumor or stroke. Computed tomography (CT) and CT angiogram can be useful to rule out aneurysm or intracranial hemorrhage, especially in patients with complaint of a thunderclap headache. A lumbar puncture (measuring opening pressure, cell counts, protein, glucose, Gram stain and xanthochromia) is useful when there is a high suspicion for intracranial hemorrhage despite negative CT studies, when infectious etiology is suspected, as well as in patients with suspected idiopathic intracranial hypertension (pseudotumor cerbri). Magnetic resonance imaging (MRI), MR angiography or MR venography can be useful when there is suspected ischemic infarction, hypertensive crisis, tumor/metastasis, increase intracranial pressure or sinus thrombosis. In patients over the age of 50 with complaints of temporal headaches, pain on palpation of the temples and jaw claudication, a sedimentation rate (ESR) is highly recommended. If the ESR value is greater than 50% patient's age, the patient is at risk for giant cell arteritis (temporal arteritis). These patients should be immediately started on oral prednisone 60-80 mg daily, referred for a temporal artery biopsy and considered for rheumatology consultation.

Neurology consultation

Most individuals with headaches can be successfully managed with headache abortives, and for those with more than 2-3 headaches per month headache prophylaxis can often successfully control symptoms. If the above work-up and management are suboptimally efficacious or beyond the comfort level of the prescribing physician, consider referral to a neurologist, as the vast majority of headaches can be well-managed by a general neurologist.

Deep Brain Stimulation & Parkinson's Disease

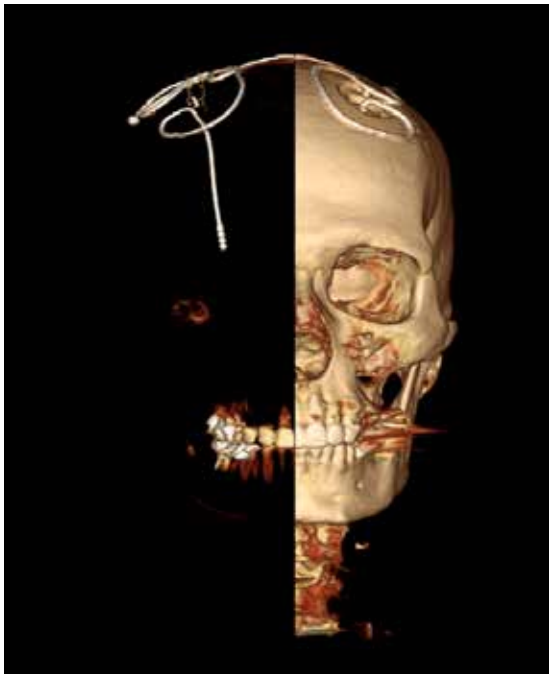
Kelly Foote, MD; William Carlton, MD; and Sasha Vaziri, MD
UF Health Neurosurgery

Kelly Foote, MD

William Carlton, MD

Sasha Vaziri, MD

By 2020 approximately one million Americans will be living with Parkinson's Disease (PD), a neurodegenerative movement disorder resulting from the loss of dopamine-producing neurons in the brain's motor circuitry. While most people recognize Parkinson's from the characteristic tremor at rest, the disease impacts quality of life in many different ways. In addition to the problematic tremor that affects three out of four patients with PD, patients experience stiffness, slowness, difficulty initiating movements, and painful dystonic muscle spasms (imagine having to live with an unrelenting muscle spasm in the ball of your foot). As the disease progresses, non-motor symptoms become more prominent and can result in difficulty swallowing, difficulty communicating due to low volume speech with poor articulation, trouble sleeping, constipation and neuropsychiatric symptoms such as depression, anxiety, or apathy. While PD does not typically cause memory loss, some decline in frontal lobe function is common, manifesting as difficulty multitasking, problems with impulse control and/or judgment. In fact, it is a non-motor symptom, aspiration pneumonia secondary to deterioration of swallowing function, that is the leading cause of death in patients with Parkinson's Disease.



Schematic of DBS Surgery

While we've painted a relatively grim picture of Parkinson's Disease, there is good news. PD is eminently treatable, and there is much ongoing research directed at curing the disease and improving the quality of life of affected people. The NIH spends over $150 million/year on PD and the Michael J. Fox Foundation has single-handedly raised more than $650 million dollars for PD research. There are new medications, treatments and gene therapies under development to not only alleviate symptoms, but hopefully lead to an eventual cure. When patients are diagnosed with Parkinson's Disease their dopamine deficit is typically treated effectively with medication. Levodopa (featured in the 1990 movie "Awakenings" with Robin Williams), is the precursor molecule to dopamine and helps increase dopamine levels in the brain. Early in the disease course, the medication will typically have a predictable and reliable response and produces marked improvement in the motor symptoms of PD. As the disease progresses over the years, and the patient's native supply of dopamine diminishes, necessary doses of dopaminergic medication predictably increase. It is not uncommon for patients with advanced PD to require levodopa dosing every couple of hours. In fact, levodopa can have such a dramatic effect on motor function that patients' lives become divided into "on-medication" and "off-medication" states.

To understand the role of deep brain stimulation (DBS) surgery in the treatment of Parkinson's disease, one must first be familiar with the phenomenon of "motor fluctuations" that typically develop as the disease progresses.

Early in the disease course, dopaminergic medications are reliable, predictable and largely able to control Parkinson-related motor symptoms. Figure 1 below demonstrates the wide therapeutic window for dopamine replacement in Parkinson's Disease early in the disease course. The benefit of repeated doses of dopaminergic medications is illustrated by the dotted green line, and it is relatively easy to maintain dopamine levels sufficient to alleviate

Continued on Page 11

Continued from Page 10

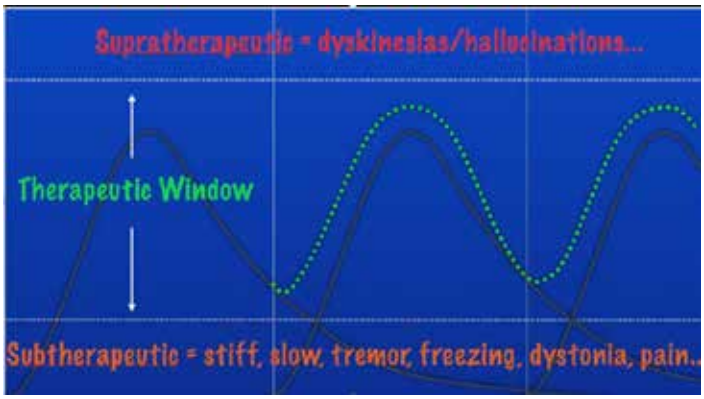


Figure 1. Dopamine replacement in early Parkinson's disease

"off state" symptoms without producing side effects of overmedication.

As the disease progresses, however, the patient's native dopamine production continues to diminish, necessitating increasingly higher doses of dopamine replacement medication (Sinemet, Retc.). Simultaneously, the dopamine-starved neurons in the brain's motor circuit progressively upregulate their dopamine receptors and become hypersensitive to dopamine, resulting in problematic extra involuntary movements-called dyskinesias-with higher medication doses.

So as the disease progresses, the therapeutic window for dopamine replacement becomes increasingly narrow and despite expert medical management, patients end up spending much of their time either in the undermedicated "off state" or the overmedicated dyskinetic state, and less time in the optimally medicated "on state." Furthermore, the effects of dopaminergic medications become less and less predictable as the disease progresses. Thus, advanced PD typically results in marked deterioration in quality of life as patients spend their days fluctuating between suboptimal states of under- or over-medication, with brief intervals of optimal function when their dopamine levels pass through the narrow therapeutic window. These pronounced variations in motor function associated with fluctuations in dopamine levels on medication are called ***motor fluctuations*** and are illustrated in Figure 2 below.

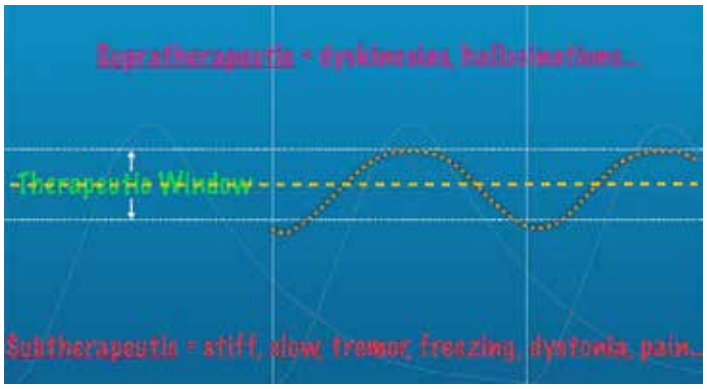


Figure 2. Motor fluctuations in advanced Parkinson's disease

Debilitating motor fluctuations are the most common indication for deep brain stimulation therapy in Parkinson's disease. DBS in the somatosensory regions of the subthalamic nucleus (STN) or the internal globus pallidus (GPI) produces similar relief of Parkinsonian motor symptoms to that seen with dopamine replacement. Unlike the effects of dopaminergic medications, however, the symptomatic relief from DBS therapy is achieved through direct electrical stimulation and does not fluctuate with dopamine levels. Once the optimal stimulation settings are determined for a given patient, the device can be set to deliver constant beneficial stimulation.

Patients generally continue to take some dopaminergic medication after DBS, but when the medications wear off, the depth/severity of the off-state motor symptoms is substantially less due to ongoing effects of DBS therapy. Remarkably, DBS (especially in the GPI) can also suppress the dyskinesias associated with peak medication doses—so DBS renders the patient's "lows less low, and highs less high." Thus, DBS acts as a horizontal line added to the sine wave of Parkinsonian

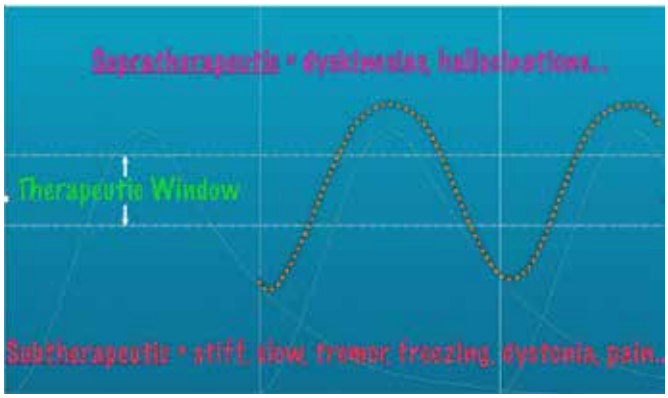


Figure 3. Effect of DBS: dampening the amplitude of motor fluctuations.

motor fluctuations, exerting a dampening effect that substantially reduces motor fluctuations in Parkinson's disease as illustrated in Figure 3.

To clarify the role of DBS in the management of PD: ***DBS does not cure Parkinson's disease.*** It doesn't even typically make patients function significantly better than they do when they are at their best level of functioning on dopaminergic medication. ***What DBS does quite well is keep the patient at or near their best level of functioning much more of the time.*** In patients with motor fluctuations, especially those with extreme highs (severe dyskinesias on medication) and/or extreme lows (pronounced tremor, rigidity, bradykinesia, dystonia, etc. in the off-state), this dampening effect results in dramatic

Continued on Page 12

Continued from Page 11

improvement in symptoms and quality of life.

When predicting benefit attainable with DBS therapy, the more pronounced a patient's motor fluctuations (i.e. the bigger the difference between the patient's on and off medication states), the more benefit they are likely to obtain from DBS therapy. Another useful rule of thumb is that those Parkinson's symptoms that improve with dopaminergic medication will likely also improve with DBS. One important ***exception*** to this rule is ***medication-refractory tremor.*** Fortunately, DBS is typically much more effective than dopaminergic medication at suppressing tremor. So much so that debilitating Parkinsonian tremor that does not respond to medical therapy is a good indication for DBS surgery independent of motor fluctuations.

At the University of Florida, we have performed nearly two-thousand DBS lead implantation procedures with successful outcomes in over 90% of patients. Perhaps it is not surprising that ***one of the world's leading centers for DBS therapy and research is located at the University of Florida,*** after all, because of the demographics of our state. Florida is the state most severely impacted by Parkinson's disease and other neurodegenerative disorders that are commonly associated with aging. Each member of our interdisciplinary DBS team (neurology, neurosurgery, neuropsychology, psychiatry, PT, OT, Speech and swallowing therapy, dietary therapy and social work) evaluates every DBS candidate to perform a careful ***interdisciplinary risk/benefit analysis.*** Our independent clinical evaluations of the patients are performed in a condensed two-day clinic experience that we call the ***"DBS fast track evaluation"*** , because all these specialists are now seen in the same location over the two-day span, while such an interdisciplinary workup used to take several weeks and require these mobility-impaired patients to travel to multiple appointments across campus. Following the fast track evaluations, our team meets in person to discuss our findings and to come to consensus regarding whether to recommend DBS surgery, and if so, how ***the procedure can be tailored to minimize perceived risk and maximize benefit for each patient.***

Deep brain stimulation surgery involves implanting a DBS lead with multiple electrodes in a precisely determined location in the brain and connecting the lead to a pulse generator implanted in the chest or abdominal wall via a tunneled extension cable. The electrical impulses delivered strategically to the brain disrupt the pathologic abnormal signals in the motor circuitry of the PD patient, resulting in improved motor function.

The majority of our DBS lead implantation procedures are performed with the patient fully awake, off their Parkinson medications, with local anesthesia only. Typically, we do not use any form of sedation and remarkably, the procedure is quite well-tolerated. It is counterintuitive for most people to think that such a procedure would not be painful. Because neither the skull, nor the brain, has any sensory nerve endings, the only pain associated with the lead implantation procedure is from injection of local anesthetic in the scalp, which is unpleasant, but brief. ***The major hurdle to overcome in performing these procedures in awake patients is not the management of pain, but the management of anxiety.*** Most patients are understandably apprehensive on the day of surgery, but our DBS surgical team has mastered the art of anxiety management (a.k.a. "hand-holding anesthesia,") and the vast majority of patients relax nicely during the procedure. Believe it or not, most patients even opt to watch the procedure on the monitor, typically conversing with the surgeon about what they are seeing. Once they realize that the procedure is not painful, they tend to be fascinated and are happy to join the elite club of rare people who have seen their own brain. Some patients do opt out of watching, and choose to watch old episodes of Friends or a favorite movie during the procedure instead. One sure-fire tactic to divert the patient's attention if they are overly anxious is to ask them about their children—it seems like for most of us, when we are talking about our kids, nothing else matters much.

We are motivated to avoid sedation, and especially general anesthesia, for two important reasons. ***1) Awake surgery is safer.*** General anesthesia has been associated with lingering adverse effects on the brain and carries risks of pneumonia, heart attack, stroke, DVT/PE, etc. These risks are even higher in elderly patients with multiple medical comorbidities and poor physiologic reserve—our typical DBS patient population. Furthermore, if the patient is awake, any neurologic injury sustained during the procedure is immediately appreciated and any necessary intervention can be instituted right away, which is preferable to discovering a rare stroke or hemorrhage when the patient awakens with new neurologic deficits in the recovery room. ***2) Awake surgery offers the opportunity to confirm the appropriate positioning of the DBS lead in the brain during the procedure, and adjust it if necessary to optimize outcomes.*** If the patient is not sedated, the information obtainable from intra-operative brain recordings is richer and more useful in selecting the final position to implant the DBS lead. Perhaps more importantly, once the DBS lead is implanted, having the patient awake enables intra-operative testing of the DBS lead. By delivering stimulation via the implanted lead, we can confirm that therapeutic benefit is achievable, and that stimulation-induced side effects will not interfere with the successful delivery of therapeutic stimulation. Not uncommonly, adjustments are made to the lead position intra-operatively when stimulation at low levels results in intolerable adverse effects, presumably resulting in fewer adverse effects post-operatively. We also believe that this intra-operative testing will result in fewer patients experiencing the unpleasant discovery-after-several post-operative programming sessions-that the DBS lead is

Continued on Page 13

Continued from Page 12

suboptimally positioned and that a repeat surgical procedure will be necessary to salvage a good DBS outcome.

Despite this preference for awake DBS surgery, we do occasionally put patients to sleep for DBS lead implantation. Cases where sedation is used include DBS operations on children, adults with anxiety disorders, patients with movement disorders involving the head and neck that preclude awake surgery, or any patient that opts for asleep DBS after a frank discussion of the associated risks and benefits.

Because the off-medication state is commonly uncomfortable, ***for many PD patients, the most unpleasant aspect of the lead implantation procedure is being off their dopaminergic medications for several hours*** (skipping a dose prior to the procedure and waiting until they reach the recovery room before they get their PD medications). We don't require this plan because we enjoy "torturing" our patients, but because the pathologic signals recorded from the brain are more robust and easier to interpret when patients are off their medications, improving our accuracy of lead localization, which improves the outcomes of DBS therapy.

DBS implantation procedures are typically performed in stages.
The DBS lead implantation procedure ("DBS part 1") takes approximately 3 hours and patients are admitted to the hospital post-operatively. Most (90%) patients are discharged from the hospital the next morning at their baseline neurologic condition and with some post-operative scalp soreness. The pain is nearly always effectively managed with Aleve and Tylenol, rarely requiring opioid pain medications, and most patients return to their normal activities within a week or so.

The pulse generator implantation procedure ("DBS part 2") is done in the outpatient surgery center and patients are discharged home the same day. Because tunneling of the extension cable would be intolerable for an awake patient, general anesthesia is necessary for the pulse generator implantation. One of the rules of general anesthesia is "the better you look going in, the better you tend to look coming out." One of the reasons we believe performing the pulse generator implantation in a staged procedure a few weeks after the lead implantation, is that most patients are frankly exhausted, and are at their worst after several hours off their PD medications and after three hours of being awake on the operating table. ***We believe that proceeding with general anesthesia and pulse generator implantation immediately after the lead implantation procedure would result in a substantially higher complication rate in this elderly, relatively frail, patient population.*** Furthermore, implantation of the DBS lead results in some swelling and inflammation in the brain that affects the electrical environment around the DBS lead. ***Waiting a few weeks before activating the implanted DBS lead enables more effective programming*** and results in more stable DBS therapy after initial activation of the DBS system.

For patients who require bilateral DBS therapy to achieve therapeutic goals, we usually recommend two short lead implantation procedures separated by at least a month, rather than one longer procedure to implant DBS leads on both sides of the brain. Most patients tolerate the 3-hour unilateral lead implantation procedure well and go home the next day without significant problems. In our experience, the 5-hour procedure required to implant DBS leads in both sides of the brain on the same day is less well tolerated. The brain is a living "supercomputer" and one important neurosurgical adage is "the brain does not like to be messed with." Perturbing both sides of the brain results in a higher incidence of transient neurologic deficits, presumably because swelling and inflammation in both sides of the brain is more functionally disruptive than disturbing one side at a time. In any case, in our hands, patients who undergo bilateral simultaneous DBS lead implantation procedures have a higher incidence of prolonged hospitalization; post-operative confusion; disorientation; and speech, swallowing or walking difficulties. While such post-operative neurologic deficits are nearly always transient, lasting days to weeks, they are quite stressful for patients, families, and the surgical team. Another factor that drives this preference for staging DBS lead implantation is that we have a higher incidence of misplaced DBS leads on the second side of a bilateral lead implantation procedure, especially in patients with significant age-associated brain atrophy, which is very common in our patient population. ***In cases where the risk is perceived to be low, we will perform occasional bilateral procedures, but we typically prefer to minimize the risk of complications by operating on one side of the brain at a time.***

The day before DBS lead implantation surgery, the patient typically obtains a special high-resolution MRI scan with intravenous contrast. These images enable us to plan the procedure in virtual space on the computer, selecting the appropriate target in the brain and a safe trajectory through the brain to get to the target. On the day of surgery, a stereotactic head ring is attached to the patient's head to enable translation of the carefully planned operation from virtual MRI-space to real space in the patient's brain. The head ring has two important functions: 1) it is a convenient way to hold the head still during surgery, and 2) more importantly, it serves as the frame of reference for the computer guidance system used for DBS targeting. The most painful part of the surgery actually occurs in the pre-operative holding area before the patient enters the operating room when four painful, but brief injections of local anesthetic are performed to numb the scalp at the sites of the four pins that secure the ring to the head. Nearly

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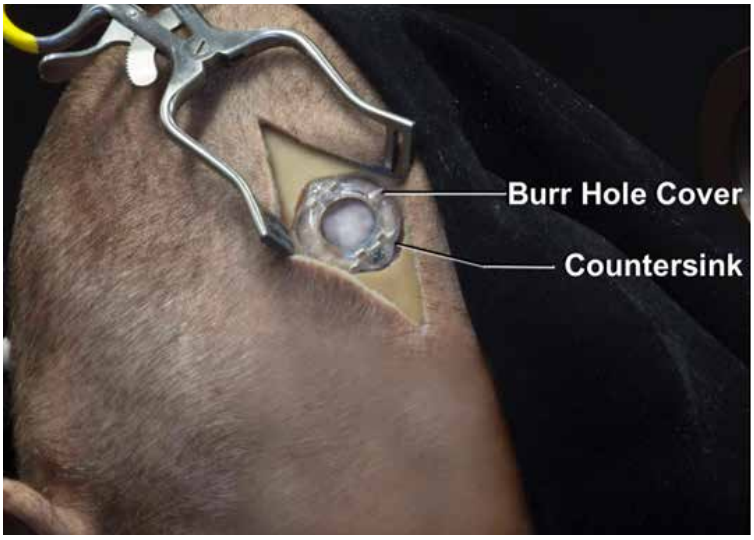

Figure 4. Illustration of the dime-sized burr hole, cap, and countersinking technique on a cadaver

all patients tolerate these shots just fine, and most are happy to be reassured that "nothing in the operating room will hurt as much as those four shots that you just experienced."

After a head CT scan is obtained with the stereotactic head ring in place, the patient is transported to the operating room and positioned in recumbent (recliner) position on the OR table with the head ring fixed to the table. Arm rests and neck padding are strategically placed to maximize patient comfort. A relaxed environment is maintained in the operating room to minimize patient anxiety. We are careful to explain the procedure to the patient as we go, and we warn the patient prior to any loud noises or unusual sensations so there are no surprises. We typically play music of the patient's choosing during the procedure. We don't shave the patient's head, we just sterilize the hair and cut a small strip of hair at the site of the 5 cm incision on top of the head. The entire surgery is performed through a dime-sized burr hole drilled in the skull. A hard plastic cap the size of a quarter is secured to the skull to cover the hole and to secure the implanted DBS lead in place. We drill a depression in the skull surrounding the burr hole to accommodate the cap so that the outer surface of the cap will be flush with the surface of the skull. This way, when the scalp is closed, the patient has no appreciable bump on his head at the burr hole site. This technique is not only cosmetically superior, but also prevents delayed scalp erosions that can occur at the site of a protruding DBS cap. (See Figure 4)

The three numbers that sum up the procedure are 90%, 1%, and 50%: Approximately 90% of patients report that their quality of life is either "much improved" or "very much improved" when asked 6-months after surgery-which we consider to be a meaningful measure of success. On the other hand, just under 1 out 100 DBS patients at UF have sustained a brain injury during the procedure that has left them with new, persistent neurologic deficits that have resulted in diminished quality of life relative to their pre-operative condition. Interestingly, despite the 90% satisfaction rate with the ultimate outcome of the procedure, approximately 50% of DBS patients have reported some adverse event associated with the surgery. These adverse events can be minor, such as a headache that did not resolve for several days, or major, such as a deep wound infection that necessitated removal of the DBS hardware in order to eradicate the infection. In such cases, a good outcome is typically salvaged after hardware removal, 6 weeks of IV antibiotics, at least 1 month of observation off antibiotics to ensure that the infection is completely eradicated, then repeat surgery to re-implant the DBS hardware. Fortunately, such serious infections only occur in about 2% of DBS patients. So the ***90:1:50 rule to set patient expectations essentially says, "if you undergo DBS surgery at the University of Florida, there is a 90% chance your quality of life will be significantly improved and you'll be glad you did it; there's a 1 in 100 chance that your brain will be injured during the procedure and you'll end up worse off after the procedure than you were before; and there's a 50:50 chance that there will be something along the way that you won't like."*** Overall, DBS is a remarkably safe and effective procedure (as any elective brain surgery must be) that has become the treatment of choice for advanced Parkinson's Disease with motor fluctuations or medication-refractory tremor. The DBS program at the Fixel Institute for Neurological Diseases at UF Health was originally established in 2002, and is has become one of the leading centers in the world for deep brain stimulation surgery, research, and education. DBS therapy provides symptomatic relief and improved quality of life not only for patients with Parkinson's disease, but also for those with debilitating essential tremor, dystonia and severe obsessive-compulsive disorder. DBS therapy is also being investigated as a promising potential treatment for many other brain circuitry disorders such as Tourette syndrome, depression, obesity, and addictive substance abuse, among others. Stay tuned, the future of DBS therapy looks very bright.

Dr. Foote reviewing the computer targeting software during DBS surgery (photo credit: Steven Robicsek)

Dementia: Diagnosis and Treatment

Justin Yancey, MD
SIMEDHealth Neurology

Dementia is a disorder characterized by a decline in cognition involving one or more cognitive domains such as learning and memory, executive function, attention, language, visual perception, and/or social cognition. The deficits must represent a decline from previous level of function and be serious enough to interfere with daily functioning and independence. The most common form of dementia is Alzheimer's disease (AD) which accounts for about 60-80 percent of cases.

As the population ages the prevalence of dementia and cognitive disorders will continue to rise. Currently about 50 million people worldwide are living with Alzheimer's disease or other dementias. Of these about 5.8 million people in the United States have Alzheimer's disease. Mild cognitive impairment (MCI) is seen in about 11.6 million Americans with about 10% per year progressing to AD. Alzheimer's disease is the 6th leading cause of death in the United States. About two-thirds of patients with AD are females, possibly related to longer life expectancy and biological factors. Between the years 2000 and 2015, deaths from heart disease have increased by 11%, while deaths from Alzheimer's disease have increased 123%. About 1 in 3 seniors will die from dementia, which is more than breast and prostate cancer combined. In 2018 the cost of dementia in this country was about $277 billion. It is important that clinicians accurately notice and diagnose the early symptoms of dementia.

Several prospective population-based studies have shown evidence that the risk of dementia is modified by medical comorbidities, lifestyle choices, and environmental factors. The risk of dementia is increased in patients with vascular risk factors and studies show that aggressive treatment of these in midlife reduces the risk of dementia in later life. Traumatic brain injury is a possible preventable cause of dementia and other neurodegenerative disorders. Sleep disturbances, such as obstructive sleep apnea, are associated with late-life cognitive decline.

Alzheimer's disease is the most common form of dementia and primarily affects older adults. It is rather unusual for AD to occur before age 60. Most forms of AD are sporadic but there are some rare inherited forms which typically present before age 60 and account for less than 1% of AD. The earliest manifestations of the disease are selective memory impairments with executive dysfunction and visuospatial impairment also often presents early in the disease course. Language and behavioral issues typically only occur later. Memory deficits are usually able to be determined at initial presentation. Memory impairments progress slowly over time and can be tested by asking the patient to learn and recall a series of words or objects immediately and then again after a delay of 5 to 10 minutes. It is also relevant to ask questions about orientation and current events during memory testing. During the interview, it is essential to compare a patient's report with that of an informant such as a family member or close friend. Patients will often have a lack of insight or deny any symptoms. Patients also tend to develop issues with executive dysfunction and family members may notice that the patient has become less organized or has trouble multitasking. Neuropsychiatric symptoms may occur later in the disease course. They generally begin with irritability, apathy, and withdrawing from social engagement. Depression can often be difficult to determine in these cases but should be treated empirically if symptoms warrant. The most difficult issues often arise with patient aggression, wandering, and hallucinations/delusions.

Continued on Page 16

Continued from Page 15

The initial evaluation begins with interviewing the patient and informant about a history of cognitive changes. Questions about activities of daily living (ADLs) help determine the degree of impairment. It is often important to determine if the patient is still able to drive or take care of finances. It is essential to screen for evidence of depression, as this may present with findings of pseudodementia. A thorough drug history is key to ensure no medications such as anticholinergics, psychotropics, or analgesics are impairing cognition. Standardized scales such as the Mini-Mental State Examination (MMSE) or Montreal Cognitive Assessment (MoCA) are the initial tests to screen for dementia, and often more extensive neuropsychological testing may be helpful in difficult cases or to establish a baseline and determine changes over time. The American Academy of Neurology (AAN) recommends some limited laboratory testing for patients being evaluated for cognitive impairment. These include screening for B12 deficiency and hypothyroidism, and if history indicates, for neurosyphilis. The AAN also recommends structural neuroimaging with either a noncontrasted head CT or MRI in the initial evaluation of all patients with dementia.

The clinical course of Alzheimer's disease is relentlessly progressive. Measurements of cognitive function should occur annually with standardized scales such as the Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), or the clinical dementia rating scale. The average rate of decline yearly on the MMSE is about 3 points but this can be variable. The average life expectancy at time of diagnosis is typically about 4 to 8 years, but this also tends to vary based on severity at time of diagnosis, gender, psychiatric features and medical comorbidities. Onset at an older age (more than 80 years) may be associated with slower progression.

Patients newly diagnosed with Alzheimer's dementia should be trialed on a cholinesterase inhibitor. These include donepezil, galantamine, and rivastigmine. They are generally well-tolerated, with the most common side effects being gastrointestinal-related including nausea, diarrhea, and vomiting. GI side effects may be reduced by use of a rivastigmine transdermal patch. In patients with moderate to advanced AD, a trial of the NMDA receptor antagonist, memantine, is recommended. Dizziness is the most common side effect.

The second most common neurodegenerative dementia is Lewy body dementia which includes the clinical diagnoses of Parkinson disease (PD) dementia and dementia with Lewy bodies (DLB). Parkinson disease dementia is cognitive decline associated with a known diagnosis of Parkinson disease. Dementia with Lewy bodies is seen often with a combination of REM-sleep behavior disorder (RBD), visual hallucinations, fluctuating cognition with variations in attention and alertness, and Parkinsonism that starts with or after dementia. Parkinson disease dementia often presents differently than Alzheimer's dementia. The typical pattern in PD dementia and DLB is with executive and visuospatial dysfunction and less so memory impairment. Visual hallucinations can be seen in at least 50 percent of PD patients with and without dementia. They are more frequent in patients with DLB and are seen in about two-thirds. Individuals formally diagnosed with RBDs have a significantly increased risk of developing a synucleinopathy such as PD or DLB and often show up 20 years before other deficits. Treatment with cholinesterase inhibitors such as donepezil, galantamine, and rivastigmine are suggested. These may also help improve behavioral symptoms. Cautious addition of very low-dose atypical antipsychotics (quetiapine and clozapine) may be helpful if hallucinations or behavioral symptoms worsen. Avoidance of other antipsychotics should be paramount as patients with DLB often have severe neuroleptic sensitivity.

Patients with Alzheimer's disease and other dementias are expected to rise in numbers to over 14 million Americans by 2050. Only a reported 16% of seniors say they receive regular cognitive assessments, yet 1 in 3 seniors will die with Alzheimer's or another dementia. Extensive research is currently ongoing looking at earlier diagnosis, new therapies, and prevention. Patients with suspected Alzheimer's or other dementia should be referred to a neurologist for additional care.

Glioblastoma Topples an American Hero, but Researchers will Continue the Fight

Duane Mitchell, MD, UF Health Neurosurgery
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Sen. John McCain withstood beatings and torture as a prisoner of war, but he was confronted with an enemy in July 2017 that he was ultimately unable to overcome. An aggressive and deadly brain cancer known as glioblastoma, or GBM, took McCain's life on Aug. 25, 2018.

The man noted for his unstoppable resilience, pervasive optimism and uncompromising personal ethos was not able to conjoin forces with the marvels of modern medicine and defeat the insidious enemy of brain cancer.

Why is GBM so deadly? Why have so many individuals, with presumably all the physical and financial resources that can be amassed readily available to them, been unable to conquer this dreadful enemy? Sen. Edward M. Kennedy died from the disease exactly nine years earlier. In 2015, GBM also claimed the life of Joseph "Beau" Biden III, son of Joe Biden, the former vice president. It kills about 15,000 people in the U.S. each year. Most people diagnosed with the disease survive less than two years.

Has GBM been cured in any individuals, and if so, why not in most who are affected by this disease?

I am a physician and scientist who studies ways to stop GBM. Despite the sadness and great loss we feel at Senator McCain's passing, we are making progress in the treatment of this disease.

An ongoing battle

By 1970, cancer had become the second-leading cause of death in the United States. It still is today, claiming about 600,000 lives a year.

In 1971, President Richard Nixon signed the National Cancer Act. While the legislation did not contain the phrase "War on Cancer," those words quickly caught on. A concerted quest to find a cure for malignant diseases had begun.

The landmark legislation broadened the authority of the director of the National Cancer Institute (NCI) to implement research programs and cooperate with other agencies to direct educational efforts focused on reducing cancer mortality in the U. S. The act created a "bypass budget" for the NCI that is submitted directly from the NCI director to the President of the United States and to Congress, highlighting the priority put on reducing cancer mortality by the U.S. government.

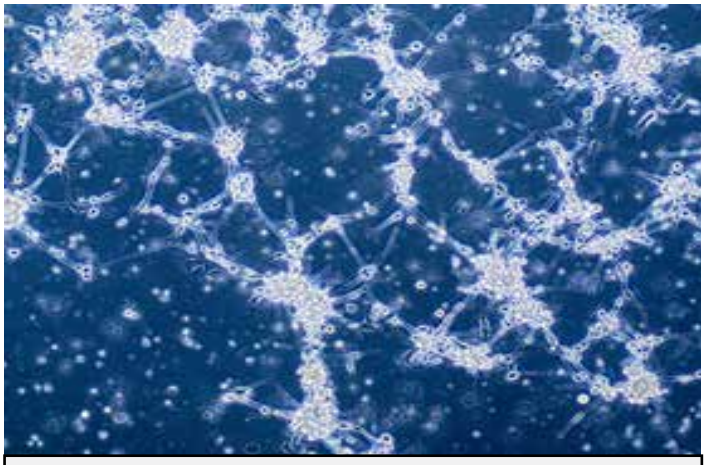
The NCI investment in cancer research, along with billions of dollars from the pharmaceutical industry, have undoubtedly had a profound positive impact on the prevention, diagnosis and treatment of cancer. However, unlike the decade of success embodied by our nation's quest to put a man on the moon, winning the war on cancer has proven to be a much more elusive goal – and much longer than 10 years.

While decades of research have led to many new, effective treatments, research also has revealed a marked complexity in many cancers, particularly those that have spread beyond the site where the tumor originated.

A first in the fight

GBM was the first cancer to undergo comprehensive genetic analysis as part of the multibillion-dollar NCI-led project called "The Cancer Genome Atlas." This ambitious quest sought to completely analyze the gene expression patterns and DNA sequence of several human cancers and make the data publicly available for scientists to study. It has been a game changer in the assault against cancer.

Scientists have learned, for instance, that GBM, like many cancers, is not a single disease. Even though two patients may receive the same diagnosis of GBM and may have tumors that look almost identical under a microscope, at the cellular level these tumors can be quite different, with different mutations in the DNA code and different pathways driving tumor growth. This understanding means that a single therapeutic approach is very unlikely to work the same in all individuals with the same diagnosis of GBM.



Glioblastoma cells under a microscope. These cells can be deceiving, however, as genetic differences may be present that do not show up under a microscope. Anna Durinikova/ Shutterstock.com

Continued on Page 18

Continued from Page 17

Essentially, these patients really don't have the same disease. This new understanding, while tremendously important in shaping our strategies for treating GBM going forward, also raises the realization that the enemy we face in GBM is even more insidious than first thought.

To add to this complexity, we understand now that even within a given patient's tumor, the individual cancer cells can even differ significantly from one another, having diverged over time through rapid growth and through the accumulation of different mutations within different tumor cells. This means that the same treatment hitting the tumor cells within a single patient will likely not kill all cancer cells with the same effectiveness. This allows resistant tumor cells within the population to grow back in the face of treatment that may have been initially effective.

Tackling this complexity at the cellular level to develop treatments that are effective against all tumor cells within a patient is a major challenge for tumors such as GBM. It likely accounts for much of the resistant nature of the disease.

Invasive tactics

An additional characteristic of GBM is the invasive nature of the disease. GBM tumor cells essentially crawl away from the main tumor mass and embed themselves deep within the normal brain, often hidden behind a protective barrier as known at the blood-brain barrier. This invasive feature means that while neurosurgeons can often remove the main central tumor mass of a GBM, the invasive finger-like projections protrude into other areas of the brain. The distant islands of tumor cells that have migrated away cannot be effectively removed by surgery.

Radiation treatment is effective in controlling tumor growth, but there are limits to the doses of radiation that can be delivered to normal brain. Chemotherapy treatment with temozolomide currently can extend survival on average by several months. But the blood-brain barrier, or specialized cells that keep threats away from the brain, restricts many drug treatments from getting into the brain, and the mixed populations of tumor cells are already poised to grow out of the cancer cells that are resistant to the agents that do get through.

Cautious optimism

When one takes an inventory of what we've learned about GBM, it is easy to become discouraged and perhaps to conclude that we are facing an insurmountable foe. Such a conclusion might be warranted, were it not for the fact that despite the incredible complexity of challenges faced in successfully treating GBM, long-term survivors of this disease do exist.

Long-term survival, or five years or longer from time of diagnosis, with standard treatment regimens is reported at 9.8 percent from a systematic study of 573 patients with GBM. While 9.8 percent is an unacceptably low rate, it is demonstrable evidence that long-term survival is feasible.

We have learned that survivors tend to be younger than 50, have tumors that were able to undergo more extensive surgical removal at diagnosis, and have molecular features that predict a better response to the chemotherapy.

Recent advances in the treatment of GBM have also brought the advent of a new device technology that delivers alternating low-intensity electric fields called tumor-treating fields. Long-term survival data has not yet been reported for the addition of tumor-treating fields to standard treatment, but a median survival improvement of 4.9 months from 16.0 months to 20.9 months was reported in a recently completed phase III clinical trial involving 695 patients. It is possible that an improvement in long-term survival rates will also be observed in patients receiving this combined treatment.

Perhaps our greatest hope comes from emerging therapeutic strategies such as immunotherapy and personalized medicine approaches. Our immune systems are hard-wired to deal with complexity and variety, needing to respond rapidly and effectively to a myriad of unknown and changing infectious threats from the environment. The field is just beginning to understand how to harness this potent and adaptable killing power to hone in on cancer cells in a comprehensive way. We have observed encouraging long-term survival outcomes in patients with GBM during our early phase clinical trials of immunotherapy and are currently evaluating the effectiveness of these treatments in large-scale clinical trials at our medical center.

The war on cancer has certainly proven to be harder, longer and more complex than many envisioned in 1971. While tremendous gains have been made in cure rates for some malignant diseases like childhood leukemia, GBM has perhaps stood stalwart in resistance over the decades to transformative progress. However, through diligence and persistence, we have begun to better understand the enemy we face at the root of this invasive brain cancer. This understanding has transformed our plans of attack and has begun to bear evidence that breakthroughs are possible and forthcoming.

Sen. McCain will be remembered for his many contributions, accomplishments and sacrifices in service of his country. He is also but one of the 600,000 Americans and 8.2 million people worldwide whose life will be claimed by cancer this year. Among the many things to be remembered, honored and cherished about his life, let the fighting legacy of this warrior remind us that war on cancer goes forward in his memory, and in honor of all that have been and will be impacted by this disease.

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Grace Thompson
University of Florida Medical Student

"So sorry to interrupt, but there is a family that just arrived and is asking if they can be seen tonight. I know it's late, but I wanted to check before I ask them to come back next week," Alex, an undergraduate volunteer asks gently. She is the first face to greet all of the patients that walk into our weekly clinic and is also the first person to offer to stay late just so we can see one extra patient. As I look over towards our intake table, I can understand why she wants the clinic to see this family tonight. Two slender but strong women stand side by side, each with a small child on her hip and 3 other young children huddled between them. Each of the children look miserably sick-their eyes downturned, sniffling and coughing, and none interested in the coloring pages offered. I survey the medical student volunteers that have yet to see a patient tonight, and my eyes settle on the one student we have left, a third- year student who had mentioned that she is interested in Pediatrics. I ask Alex to hold on a second, and sidle up to the third-year student to explain the situation, as I know I am asking her to see not 1, but 5 patients. Before I can finish my plea, she jumps right in, "Of course! I'll just need an otoscope/ophthalmoscope, hand sanitizer and alcohol wipes, and a space to examine them." While I hold myself back from smothering her with a grateful hug, I hurry back over to Alex and ask her to do intake paperwork on the family. We will, in fact, be able to see them tonight. Alex flashes a big grin and rushes off to tell the family.

The above story occurred at one of our Equal Access Clinic (EAC) locations earlier this year and is only one example of so many families and individuals that come to see us each week. We are often their only avenue for access to healthcare. The Equal Access Clinic Network is a student-run network of free clinics operating in multiple locations across the city of Gainesville which aims to serve the uninsured and underinsured citizens of our community. It was founded in 1992 as 1 clinic location, and has since expanded to include 4 primary care sites operating Monday-Thursday nights, 4 specialty clinic sites, and many more specialty services that are offered at varying locations throughout every month. Each of the 4 primary care clinics has dedicated medical, undergraduate, PA and pharmacy student officers who run the clinic each week, and multiple student volunteers from each of those schools who make it possible to see the volume of patients received each night. They also have volunteer physicians (many of whom come straight from clinic or the hospital) who donate their time to provide healthcare to our community.

I grew up in Gainesville and was always very privileged to have two parents who could afford (both financially and with their time) to take me to a Pediatrician. The first time I noticed that this was not the situation for every child, was through playing volleyball in high school. At the beginning of every season, our coach would emphasize how important it was to get our sport physicals done and turned into him ASAP in order to be eligible to play. It would then be inevitable that 2 or 3 girls would disappear from the team after that deadline had passed. Being as fortunate as I was, my parents took care of it all for me. They scheduled my doctor appointment and turned in the completed paperwork. I remember thinking (naively) "why couldn't those girls just get the physical done?" I even remember assuming they were just disorganized or procrastinators. Now, as an officer at Equal Access Clinic and seeing the mass influx of patients who come to us (especially over the summer), seeking school and sport physicals, I regret the thoughts and judgments of my younger self. I realize now that I was privileged to have easy access to healthcare. The number of patients who lack that access in our community is staggering, and while the reasons are varied, this is a significant issue and EAC is working to address it.

Our mission statement at EAC is to "Provide quality comprehensive healthcare for all", which, while a wonderful goal, does not paint a true picture of what we do every week at clinic. As an officer who has the honor of working with patients, our goals are more tangible: to get Mrs. L a blood pressure medication she can afford, to get A.J. and B.T. medically cleared to play football for their high school this season, to get Mr. J connected with free physical therapy in the community for his chronic knee pain, to educate Ms. P on why it's so important for her to check her blood sugar regularly and manage her diabetes more carefully, and so much more. In essence, we aim to make our community a little healthier one patient at a time, and it takes a village of us (undergraduate students, pharmacy students, PA students, medical students, dental students, Physical and Occupational Therapy students), all with the drive to do better for these patients and our community, to do so.

To follow up on the family I opened with, it turned out that all of the children had contracted a bacterial infection (no wonder they looked so miserable) and our Pharmacy student volunteers looked up where the antibiotics would be cheapest and easiest for the family to travel to-- less than four dollars at Wal-Mart's pharmacy. While many of us may not think about it, antibiotics can become expensive very quickly without health insurance, so this team effort made obtaining the antibiotics affordable for this family. Also, the family shared with me that coming to see us was the first time any of them had been to a doctor in 3 years, as they have not had health insurance in awhile. I thanked them for sharing their story, and also for choosing to come to us for their healthcare needs. Before they departed, one of our clinic officers smartly thought to hand them our weekly schedule of clinic times and locations, so maybe we will see them back again in the future. I know that I certainly hope we will.

ACMS HAPPENINGS

ACMS January Dinner Meeting
Sweetwater Branch Inn, January 15, 2019

Keynote Speakers Theresa Beachy, PhD; and Kathleen Dully, MD

Carl Dragstedt, DO, ACMS Secretary/Treasurer and Mary Aplin, MD.

Madison Szar and David Tyson, Medical Student Representative.

L to R: Charles Sninsky, MD; Dean McCarley, MD; and Forrest Clore, MD.

Mrs. Mary Barrow and Mark Barrow, MD.

L to R: Elias Sarkis, MD; Elizabeth Sanders, MD; and Mack Tyner, MD.

ACMS January Dinner Meeting
Sweetwater Branch Inn, February 12, 2019

Su-Min Oon, MD and John LiVecchi, MD.

Jyoti Budania, MD and Catherine Boon, MD.

L to R: Patricia Hess, MD; Kathy Dully, MD, Keynote Speaker; and Jackie Owens, ACMS Executive Vice President.

Consuelo Soldevila, MD and Larissa Lim, MD.

Richard Martin, MD and Thomas Lau, MD.

Mrs. Gerri Gessner and Ira Gessner, MD.

ACMS HAPPENINGS

Haven Hospice Memorial Event
January 24, 2019

Rudy Gertner, MD; and Orvin Jenkins, MD.

Scott Medley, MD Speaking to the guests. In background L to R: Earle Pickens, MD; Sharon Jones; Gayle Mattson; Brenda Pickens; and Orvin Jenkins, MD.

Mrs. Nohra Londono and Mrs. Pat Tarrant.

FMA Town Hall Meeting
Cypress Grove Brewing Company, February 21, 2019

L to R: Matheen Khuddus, MD, ACMS President; Steven Reid, MD; Corey Howard, MD, FMA President; Ronald Giffler, MD, FMA President Elect; David Winchester, MD, ACMS Past President; Robert Hamburger; Matt Crowley, FMA COO; Mark Scarborough, MD; John Colon, MD, ACMS Past President.

L to R: Matheen Khuddus, MD, ACMS President; Doug Murphy, MD, FMA Secretary; Corey Howard, MD, FMA President; Irene Malaty,MD; Matt Crowley, FMA COO; John Colon, MD and Robert Hamburger.

ACMS February Dinner Meeting

Audi Gainesville, February 12, 2019

L to R: Howard Noble, MD; Mrs. Barbara Noble; Mrs. Arlene Colon; and John Colon, MD, ACMS Past President.

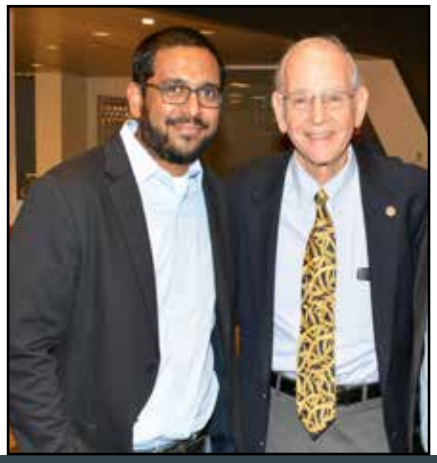
Matheen Khuddus, MD, ACMS President and Keynote Speaker Jay Hutto, CPA, James Moore, CPAs.

Caroline Rains, MD and Scott Medley, MD, *House Calls* Executive Editor.

L to R: Madeleine Mills, VP, Community Bank & Trust; Brian Berrihill; Lee Ebanks; Misty Barnett; and Mrs. Roslyn Levy.

L to R: Navid Farabahkhsh; Ryan Parrish; Julia Buddendorff; and Mathew Taddeo.

ACMS HAPPENINGS



Matheen Khuddus, MD, ACMS President; and Norman Levy, MD, PhD, ACMS Past President.

L to R: Representing Dance Marathon Alex Everitt; Jamie Breit; and Olivia Taylor.

Vijay Patel, MD and Brad Nesmith, MD.

Blanca Millsaps, ACMS Graphic Designer and Kathryn Ednie, MD.

ACMS February Dinner Meeting
Audi Gainesville,
February 12, 2019

L to R: Keynote Speaker Jay Hutto, CPA; Scott Medley, MD, *House Calls* Executive Editor; Glenn Rousseau, MD; and Steven Reid, MD.

ACMS March Dinner Meeting
University Air Center, March 20, 2019

Michael Lukowski, MD, Keynote Speaker.

T. James Gallagher, MD, Keynote Speaker.

L to R: Norman Levy, MD; Howard Noble, MD; Scott Medley, MD, *House Calls* Executive Editor.

Christopher Bray, MD, and Nicholas Bray.

L to R: Carl Dragstedt, DO, ACMS Secretary/Treasurer; Matthew Ryan, MD, PhD, ACMS Vice President; and Andrew Hood.

L to R: Judith Lightsey, MD; Lloyd Alford; Lauren Aycock; and Andrew Hood.

Shane Clark, Medical Student and Frans Badenhorse, MD.

ACMS HAPPENINGS

ACMS March Dinner Meeting
University Air Center, March 20, 2019

L to R: Howard Noble, MD; Arlene Colon, ACMS Alliance President; and John Colon, MD, ACMS Past President.

L to R: Leonard Furlow, MD; Michael Lukowski, MD; and Amy Nance, MD.

Jonathan Williams, MD and Richard Neiberger, MD.

L to R: Frans Badenhorse, MD, Thomas Lau, MD; Andrew Hood; Erin Porter; Scott Medley, MD; Mrs. Judy Lukowski; Wade Jones; and Pam Landis.

L to R: James Gershow, MD; Norman Levy, MD, PhD; and Mrs. Roslyn Levy.

Forrest Clore, MD and Jimmy Millsaps.

L to R: Mrs. Ellen Gershow; Scott Medley, MD, *House Calls* Executive Editor; and Caroline Rains, MD.

ACMS April Dinner Meeting & Vendor Show
Hilton UF Conference Center, March 20, 2019

Norman Levy, MD, PhD; and Mrs. Roslyn Levy.

Physician Burnout Panelists from L to R: Martha Brown, MD; Sarah Fayad, MD; and James Lynch, MD.

Wendy Garlington, MD and James Garlington, MD.

L to R: George Caranasos, MD; Jeff Dodd, Veteran Volunteer; and Billie Adkins, RN, both with Community Hospice & Palliative Care.

Billie Adkins, RN and Patricia Hess, MD.

Cynthia Larimer, MD and Yousseff Wasseff, MD.

FIFTEEN FUN FACTS ABOUT YOUR BRAIN

SCOTT MEDLEY, MD
House Calls Executive Editor

[Editor's note: I felt that this issue of HOUSE CALLS featuring Neurology was an excellent opportunity to relay some of the interesting facts I found in one of my favorite books: The Owner's Manual for the Brain by Pierce J. Howard, Ph.D., Bard Press, 940 pages. The direct quotes below come from this fascinating book.]

1. "Your brain has the capacity to store 2.8×10^{20} bits of information."

2. "Your brain is a library that can store 10 million thousand-page books."

3. "Your nervous system has the capacity to supply enough power to illuminate a 25-power light bulb."

4. "Your brain has about 23 billion cells, or neurons." (Some authors say 80 billion neurons)(There are currently about 7.7 billion people on earth in 2019.)

5. "Each of your neurons is connected to hundreds of other neurons by anywhere from 1,000 to 10,000 synapses."

6. "It is the density of the brain, as measured by the number of synapses, that distinguishes greater from lesser mental capacity."

7. "Learning means new synapses, and newer synapses mean higher brain density. The ratio of synapses to neurons increases for people who continue using their brains, and decreases for people who stop." (Use it or lose it!)

8. "Your brain has, of course, two hemispheres. The left side of the brain is usually responsible for processes such as language, logic and math." (Left = Logic)

9. "The right side of your brain is the seat of nonverbal processes, spatial skills, and art." (Right =Rainbows)

10. "Males tend to have right hemispheres larger than left. Females tend to have left hemispheres larger than right."

11. "If you're an average adult, your brain weighs about 3 pounds (1300-1400 gms.)."

12. "The average person loses about 10% of his brain weight in a lifetime."

13. "individual rates of brain cell loss (due to aging) vary widely...about 60,000 neurons per day for a heavy drinker or alcoholic."

14. "brain shrinkage of 3-5% during pregnancy is normal. Compare that with the shrinkage of around 10% in Alzheimer's patients. Six months after delivery all of the women's brains had returned to normal size."

15. "Seniors with the ApoE4 gene (associated with Alzheimer's) and either atherosclerosis or diabetes were eight times more likely than others to show significant cognitive decline."

So "the moral of the story" is...your brain is an incredibly marvelous organ. Please continue to use it regularly and don't abuse it by developing atherosclerosis, diabetes or dementia. And don't drink too much alcohol or abuse drugs. And most importantly, don't get old, and if you do get old, don't get pregnant!

ACMS Board Highlights

Alachua County Medical Society - Board of Directors Meeting Minutes, November 6, 2018

Pursuant to notice, the Board of Directors of the Alachua County Medical Society met on Tuesday, November 6, 2018 at The Cardiac and Vascular Institute.

Approval of Minutes: The minutes of the October 2, 2018 meeting were presented. Dr. Levy moved approval, with a second by Dr. Jones. The minutes were approved by the Board.

Secretary's Report: Dr. Khuddus presented the following names for membership: Mauro Lodolo, MD; Amy L. Nance, MD; Sandra Sullivan, MD and returning member Robert L. Dubuisson, MD. Dr. Jones moved approval of the new members, seconded by Mr. Tyson.

Treasurer's Report: Ms. Owens presented the Year to Date Balance Sheet and P & L statement (3 months) for the ACMS and the ACMS Foundation. The report was motioned for approval by Dr. Jones, seconded by Dr. Riggs and approved by the Board.

President's Report: Dr. Khuddus discussed the new Board member nominations with the group, receiving additional nominations from the floor. Dr. Khuddus presented the two nominations for the UF Resident Board Member position to the Board. After review, the Board unanimously decided to accept both applicants (Faraz Afridi, MD and Brittany Sorensen Bruggeman, MD) as approved Board members.

EVP Report: Ms. Owens discussed potential dates for the visit from FMA President Dr. Corey Howard and future dinner meeting topics and potential dates.

Alachua County Medical Society - Board of Directors Meeting Minutes, January 7, 2019

Pursuant to notice, the Board of Directors of the Alachua County Medical Society met on Tuesday, January 7, 2019 at The Cardiac and Vascular Institute.

Approval of Minutes: The minutes of the November 6, 2018 meeting were presented. Dr. Jones moved approval, with a second by Dr. Dragstedt. The minutes were approved by the Board.

Secretary's Report: Dr. Khuddus presented the following names for membership: Gabriele DeMori, MD; and John LiVecchi, MD; returning members Innocent Odocha, MD; Frederick Moore, MD; and Nancy P. Mendenhall, MD. Dr. Levy moved approval of the new members, seconded by Mr. Tyson.

Treasurer's Report: Ms. Owens presented the Year to Date Balance Sheet and P & L statement (5 months) for the ACMS and the ACMS Foundation. The report was motioned for approval by Dr. Levy, seconded by Mr. Tyson and approved by the Board.

President's Report: Dr. Khuddus discussed the new Board member nominations. The following new Board Members were approved: Payam Chini, MD; Harry Meisenbach, MD; Ki Park, MD; Eric Rosenberg, MD; and Ann Tong, MD. A motion for approval was made by Dr. Ryan, seconded by Dr. Jones and approved by the Board. Dr. Khuddus introduced our new UF Resident Board Member Brittany Sorensen Bruggeman, MD.

EVP Report: Ms. Owens mentioned that Dr. Corey Howard, FMA President would be conducting the Installation of Officers at the May 14 Dinner Meeting and that the FMA would sponsor the event. Ms. Owens also discussed a contract that Santa Fe College had requested we sign for the We Care Dental Clinics that are conducted at their facility. After review, the Board concluded that the proposed contract is not favorable to the ACMS and that an attorney be contacted to rewrite it as needed. Dr. Levy asked that we recognize Libby Furlow, who passed away recently, at our next Dinner Meeting for all her contributions to the ACMS, Alliance and the Robb House over the years. The Board agreed.

Alachua County Medical Society - Board of Directors Meeting Minutes, February 5, 2019

Pursuant to notice, the Board of Directors of the Alachua County Medical Society met on Tuesday, February 5, 2019 at The Cardiac and Vascular Institute.

Approval of Minutes: The minutes of the January 7, 2019 meeting were presented. Dr. Skidmore moved approval, with a second by Dr. Ryan. The minutes were approved by the Board.

Secretary's Report: Dr. Dragstedt presented the following names for membership: Payam Chini, MD and Ki Park, MD. Dr. Levy moved approval of the new members, seconded by Dr. Rosenberg.

Treasurer's Report: Dr. Dragstedt presented the Year to Date Balance Sheet and P & L statement (6 months) for the ACMS and the ACMS Foundation. The report was motioned for approval by Mr. Tyson, seconded by Dr. Ryan and approved by the Board.

President's Report: Dr. Khuddus requested volunteers for the Scientific Committee for the May ACMS Research Poster Symposium. Drs. Khuddus, Rosenberg, Colon, Levy and Riggs agreed to participate. Also discussed was the ACMS Annual Awards nominations. Drs. Ryan, Dragstedt and Colon have agreed to volunteer for the Application Review Committee.

EVP Report: Ms. Owens gave the status of the contract with Santa Fe Dental School. The original contract was rejected by the ACMS as it was written and sent back to Santa Fe College for revisions. The group recommended several panelists for the April panel discussion on Physician Burnout. The Marion County Medical Society would like the ACMS to consider joining their Health Insurance Co-op. The Board decided to ask the group to present their idea at a later Board meeting. An announcement was made to invite all members to a Town Hall Meeting sponsored by the FMA on the 21st of February.

Interview with the Medical Examiner

An Interview by Scott Medley, MD with William Hamilton, MD.

Dr. Medley

Dr. Hamilton

I have known Dr. Bill Hamilton for almost 40 years. In 1981, the same year I established my private medical practice at Gainesville Family Physicians, Bill was appointed by Governor Bob Graham as the Medical Examiner for Florida's Eight District (Alachua, Baker, Bradford, Gilchrist , Levy and Union counties. Later, Dixie County from the third Judicial Circuit contracted with Dr. Hamilton's office to provide medicolegal death investigation services.) Dr. Hamilton has served as Medical Examiner for an astounding 38 years. During that amazing tenure he has gained the high respect, trust, and admiration of the legal, law enforcement and medical communities. Even though he is very busy, Bill was gracious enough to sit down with me for this interview.

Editor (Dr. Scott Medley): What were your career aspirations when you were in medical school?

Dr. Hamilton: Early in medical school a professor asked me in what field of medicine would I make my career. I responded that I'd like to do either Family Practice or Pathology. The professor was rather taken aback and said those are very different fields. I responded that they were actually quite similar specialties in that they covered the broadest range of medical problems.

Editor: When did you develop an interest in pathology in general and Forensic Pathology in specific?

Dr. Hamilton: Forensic Science has always fascinated me. Early in medical school at the University of Miami I was fortunate enough to spend a few weekend days with Dr. Joe Davis at the Dade county Medical Examiner's Office, which at the time was conveniently located adjacent to the Emergency Department of Jackson Memorial Hospital. I liked the fact that autopsies quickly established answers concerning cause and manner of death and elucidated the nature of contributing factors such as concurrent diseases, disabilities due to previous injury, and chemical intoxication. I also recognized the fact that Forensic medicine was a very under-served Medical specialty. Even now, there are only about 500 practicing Forensic Pathologists in the United States, and half of the Fellowships go unfilled every year.

Editor: You were appointed Medical Examiner in 1981. How often are you reappointed?

Dr. Hamilton: I am reappointed every three years.

Editor: If my math is correct, that means you have been reappointed some 12 times.

Dr. Hamilton: That sounds about right. We serve at the pleasure of the Governor. The Medical Examiner Commission recommends reappointment after the State Attorney, the Public Defender, Law Enforcement Chiefs, County Commissioners, and Funeral Directors in the District have been questioned as to the performance of their Medical Examiner.

Editor: I understand that you moved offices four times... and thank you for giving me a tour of these impressive new offices.

Dr. Hamilton: Yes, these offices are quite an improvement. I'm sure you remember, Scott, when our first location was in the basement of Alachua General Hospital. We've come a long way!

Editor: About how many autopsies have you performed in your career?

Dr. Hamilton: I'm sure it's over 10,000. This past year we did 594 autopsies and completed 777 death investigations. I have two associate Medical Examiners to assist me. Office staff includes an administrative assistant, 3 death investigators, one investigations supervisor, 2.5 autopsy technicians and a chief of operations.

Editor: As you know, we have done a series of articles in House Calls about the opioid crisis and resulting deaths from it. Do you think that is part of the reason for the increased number of autopsies you had last year?

Dr. Hamilton: Drug-related deaths of all sorts have increased. In addition to opioids, including fentanyl and fentanyl analogs, we are seeing the usual spectrum of alcohol, cocaine, methamphetamine, synthetic cannabinoids and mixed drug intoxications.

Editor: About how long can a body wait for an autopsy?

Dr. Hamilton: Autopsies are done as soon as possible after facts concerning the circumstances surrounding death have been gathered. Florida Statute 406 requires investigation of deaths due to homicide, suicide, accident, deaths in prison or in police custody, deaths due to poisoning, Public health hazards, occupation, sudden and unexpected death when in apparent good health, deaths

Continued on Page 31

Continued from Page 30

MEDICAL EXAMINER

under suspicious and unusual circumstance and deaths that occur without attendance by a recognized medical practitioner. We are also required to review death certificates when a body is to be cremated, dissected or buried at sea. It is not always obvious to busy medical practitioners that a death should be reported to the medical examiner, e.g., if an elderly person falls and breaks a hip and then dies shortly afterward in the hospital with a terminal pneumonia, it is probably an accidental death.

Editor: What if the family objects to an autopsy?

Dr. Hamilton: We honor family wishes if possible. Some religious traditions have strong objections to autopsy examination and want bodies released as soon as possible. If there are no significant third party rights at stake, we honor their wishes even if it means that important questions remain unanswered. In the case of homicide, autopsy is usually considered mandatory to provide evidence for criminal litigation. We consult with the State Attorney before proceeding with postmortem examination against family objection.

Editor: I understand that a person's death is a matter of public record. Are autopsy findings confidential?

Dr. Hamilton: Reports of Medical Examiner investigation are a matter of public record. However, some autopsy reports and all autopsy photographs are protected by special statutes or court order.

Editor: About how often do you perform a death investigation?

Dr. Hamilton: This is a team effort. I have a great team of investigators who do most of the death investigations, but they always call me when needed and I always go to the scene if they request it. A ME is always available on weekends here. That's not the case everywhere.

Editor: You were highly involved with the investigation of the "student murders" when five students were viciously murdered here in 1990. That must have been one of the most challenging times in your career.

Dr. Hamilton: The student killings produced challenging times for the University of Florida and for the entire Gainesville-Alachua county community. Serial killer investigations are solved by cooperative efforts between law enforcement agencies, medical examiners, the legal system and by valuable information from private citizens and the community at large. It takes a lot more shoe leather than sophisticated scientific sleuthing to solve a major crime (or even a minor one).

Editor: Anything you'd like to add about autopsies?

Dr. Hamilton: Something that people don't always think about, is that this person may have a funeral with an open casket. We try to leave the body in good viewable condition, and assist funeral directors by leaving large vessels intact and accessible for embalming.

Editor: We're always hearing about a "coroner's case". What's the difference between a Medical Examiner and a coroner?

Dr. Hamilton: A Medical Examiner is always a physician—M.D. or D.O. Fortunately, throughout the state of Florida, we only have Medical Examiners.

Editor: Do some localities still "elect "coroners without respect to their education and training?

Dr. Hamilton: A number of states still have elected coroners who have widely varying qualifications for death investigation. In some jurisdictions popular vote is the only qualification needed to become the coroner. At the other end of the spectrum are the qualified coroner systems which require medical or legal education before one may be elected or appointed as the coroner.

Editor: We hear that toxicology tests may take several weeks. Why is that?

Dr. Hamilton: Not every lab test is done every day. Some of these tests are quite sophisticated, and the tests may be "batched" and only done every week or so. We try to get the results as soon as we can. A variety of body fluids and tissues may be submitted for chemical analysis. The results are then correlated with circumstances surrounding death and autopsy findings.

Editor: When I was in Private Practice, I would receive calls from Law Enforcement asking me if I would sign the Death Certificate for one of my patients who died outside the hospital, stating that the patient died of "natural causes" so that an autopsy could be avoided. Was this a good idea?

Dr. Hamilton: It is standard practice. If a patient has one or more potentially lethal clinical conditions and if the circumstances of death are natural, it is entirely appropriate to certify death as being due to the natural disease most likely to have caused it, e.g., ischemic heart disease, chronic obstructive lung disease, cirrhosis of liver, etc. Mechanisms of death such as cardiac arrest, respiratory arrest, acute renal failure, multisystem organ failure, etc., must be further qualified so as to specify the underlying organic disease leading to the fatal pathophysiologic derangement.

Editor: About how often must you appear in Court to testify? Is that difficult for you, or are you used to it?

Dr. Hamilton: About half a dozen times a year I must appear personally. It doesn't bother me. I just remember to always tell the truth, and that I am a neutral party between the prosecuting and defending attorneys. Over the years, I have actually developed cordial relationships with many attorneys on both sides.

Continued on Page 32

Continued from Page 31

Editor: Lately, there seems to be a surge in public interest in Forensic Pathology due to TV shows like CSI, etc. Any opinions about that?

Dr. Hamilton: The goal of the producers, directors and actors on these shows is to construct scenarios that manipulate emotions, create special effects and further political agendas. They do not depict "Forensic Science" but "Forensic Science Fiction." They solve every case within the allotted one hour time frame with the assistance of a laboratory technician who can complete every conceivable laboratory test during that same time.

Editor: You have been the Medical Examiner here for an amazing 38 years. About how much longer do you plan to serve in this position?

Dr. Hamilton: I still enjoy what I do. I have a great team, and every day is different...I never know what to expect. I'm at the beginning of a new 3-year cycle, so we'll see what happens after that.

Editor: Can you tell us about some of your most interesting cases?

Dr. Hamilton: Every case is interesting. I have always had an interest in trauma and we see a lot of it. We also see an amazing variety of natural diseases. The rare and unusual seem to occur with incredible frequency. Continuing education is an everyday occurrence and not confined to seminars and professional society meetings.

Editor: Anything else you'd like to add?

Dr. Hamilton: The lead dog may have the best view, but without the team behind him he would not go very far. We are extremely grateful for the help we routinely receive from our medical colleagues at UFCOM and in the communities that we serve. A large debt of gratitude is due the Forensic chemists at UF Pathology Forensic Toxicology laboratory and to the Forensic Anthropology team at the C.A. Pound Identification Laboratory. Law enforcement agencies, the Department of Corrections and the members of the legal community are valuable members of our extended "team" dedicated to the goal of ascertaining and evaluating all of the pertinent issues that arise in a public death investigation. Also, if I had it to do all over again, I would do it exactly the same way.

Editor: Well I can certainly understand that...it sounds like you've had, and are still having, a fascinating career. Thank you so much for your time.

Dr. Hamilton: Thank you!

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Eduardo Marichal, M.D.
Comprehensive Women's Health

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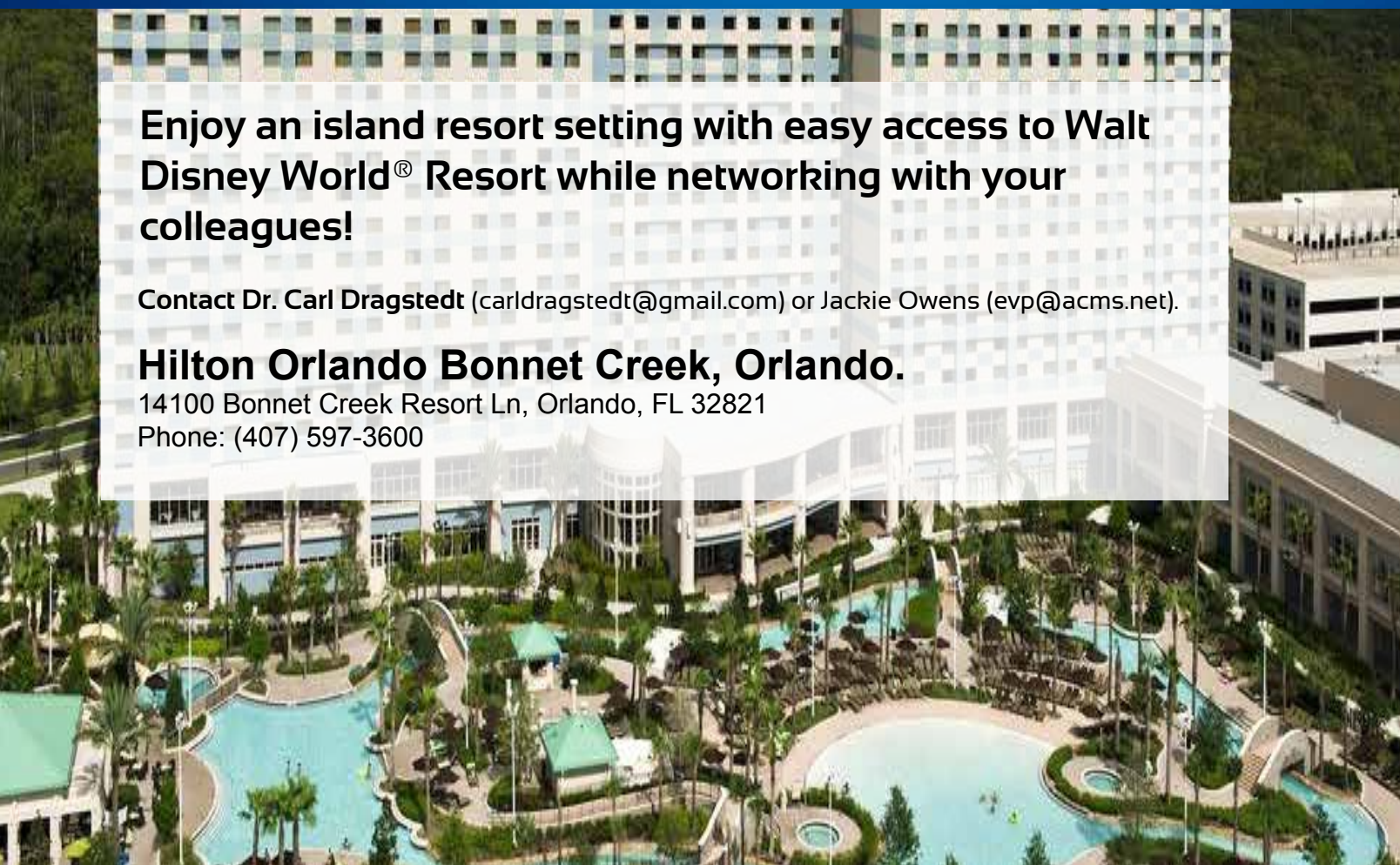

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