

HENRY FORD

SYNAPSE

— *Neurosurgery* —

Spring 2019



A Look Inside

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- DBS for Epilepsy
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LETTER FROM THE CHAIR



Dear Colleagues and Friends,

This issue of Synapse highlights the many ways we are achieving our vision of a patient-centered, neurosurgery department of tomorrow, providing hope to our patients, while transforming their lives through world-class translational research and treatment.

FOCUSING ON SPINE SURGERY OUTCOMES

The Michigan Spine Surgery Improvement Collaborative (MSSIC) continues to drive quality improvement (QI) at hospitals throughout the State of Michigan, improving patient outcomes and reducing rates of adverse events. We now have nearly 10 million data points and almost 50,000 patients to begin to optimize care and best practices. The lessons learned from this QI initiative will almost certainly change the standard of care and elevate the practice of spine surgery around the world.

PROVIDING THE MOST ADVANCED TREATMENTS

Our team recently performed the first deep brain stimulation (DBS) procedure for epilepsy in Michigan, building on a long heritage of advanced epilepsy treatment. In addition, our growing Skull Base, Pituitary and Endoscopy Center provides expert, multidisciplinary treatment for the most complex skull base and intracranial conditions, including skull base reconstruction.

LEADING ON STROKE CARE

Our Comprehensive Stroke Center is one of few in Michigan with this specific Joint Commission designation, and is delivering results that significantly surpass national benchmarks. We are also working to advance the field of stroke care in other ways, including the 2nd Annual Detroit Stroke Conference we hosted recently as well as a new neuroendovascular fellowship that is in development.

DRIVING NEW RESEARCH

We currently have the highest number of active research grants in our department's history, and our physicians and scientists continue to break new ground through clinical trials and publications. This extensive research effort includes our dedicated and accomplished residents, who are working to help shape the field of neurosurgery in their own way.

I could not be more proud of our team, and look forward to our future, where we will continue to push the boundaries of advanced patient care.

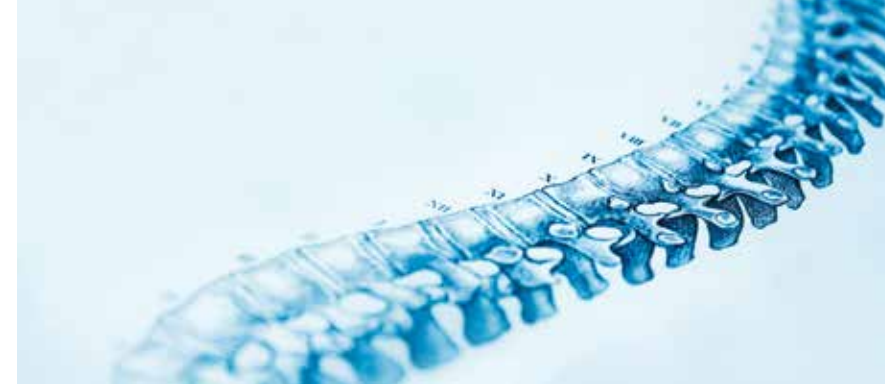
STEVEN N. KALKANIS, M.D.

Professor and Chairman, Department of Neurosurgery
Mark L. Rosenblum Endowed Chair in Neurosurgery
Co-Director, Neuroscience Institute
Medical Director, Henry Ford Cancer Institute

HENRY FORD ACTIVE IN MANY LEADERSHIP ROLES

Team members in our department have established themselves as leaders in the field through many regional, national and global roles. Some recent highlights include:

- **ABNS:** At the 2018 American Association of Neurological Surgeons (AANS) meeting, **Dr. Steven Kalkanis** was recognized for his election as a Director of the American Board of Neurological Surgery (ABNS).
- **CNS:** **Dr. Kalkanis** also is President-elect of the Congress of Neurological Surgeons (CNS). His term begins October 2019.
- **JOINT SECTION ON PAIN, MANS & ASSFN:** **Dr. Jason Schwalb** is the current President of the AANS/CNS Joint Section on Pain. He also serves as Vice President of the Michigan Association of Neurological Surgeons and on the Executive Committee of the American Society for Stereotactic and Functional Neurosurgery (ASSFN). (See related **FACULTY SPOTLIGHT** on back cover)
- **ASSFN/WINS:** **Dr. Ellen Air** serves on the Executive Committee of ASSFN along with Dr. Schwalb. Henry Ford, Cleveland Clinic and Case Western Reserve University are the only centers with multiple representatives on the ASSFN Executive Committee. Dr. Air also is active in the Women In Neurosurgery (WINS) Speakers Bureau in the Education, Epilepsy and Pain/Functional areas.
- **JOINT SECTION ON TUMORS:** **Dr. Ian Lee** and **Dr. Adam Robin** both serve on the AANS/CNS Joint Section on Tumors Executive Committee.
- **SNO:** Henry Ford Neurosurgery had a significant presence at the Annual Meeting of the Society of Neuro-oncology (SNO) in November 2018. Our physicians and researchers presented on over a dozen different topics, from genomic treatments to quality of life.
- **FIENS:** Through his work with the Federation for International Education in Neurosurgery (FIENS), **Dr. Jack Rock** has volunteered in Thailand, Vietnam and Ethiopia, providing hands-on training and education to local neurosurgeons and critical patient care assistance. (See related **SOUTHEAST ASIA** story on p. 5).
- **CMS:** **Dr. David Nerenz** recently served as lead author on a landmark study that evaluated the Star Rating system used to rank all hospitals across the country in terms of quality metrics, which was introduced by the Centers for Medicare & Medicaid Services (CMS) in 2016. (Study: <https://bit.ly/2UtXdPK>). Dr. Nerenz and his team of researchers demonstrated how an alternative approach to the current scoring system in the Safety of Care domain could help produce more accurate and informative results.



MSSIC UPDATE

Support for the Michigan Spine Surgery Improvement Collaborative (MSSIC) is provided by Blue Cross Blue Shield of Michigan (BCBSM) and Blue Care Network (BCN) as part of the BCBSM Value Partnerships program.

Henry Ford Health System is the Coordinating Center for MSSIC, which has 26 hospital sites. The Collaborative has followed nearly 50,000 patient cases for up to two years so far, and implemented three quality improvement (QI) initiatives: surgical site infection, urinary retention and readmissions.

CONTINUED SUCCESS IN QUALITY IMPROVEMENT

Active, organized quality improvement work began in 2017, and MSSIC has continued its success in quality improvement in 2018 (see sidebar at right). These upgrades don't happen by accident – they are the result of careful analysis to identify QI opportunities and hard work by Coordinating Center staff as well as clinicians and administrators at participating hospitals.

MSSIC OPEN HOUSE IS FIRST OF ITS KIND

In November 2018, Henry Ford West Bloomfield Hospital hosted an open house for MSSIC participants. This type of site visit was the first of its kind among all 26 quality improvement collaboratives in Michigan. Sixty-nine participants from MSSIC hospitals were present, including surgeons, data abstractors, spine coordinators, clinical nurse specialists, nurse managers/directors, mid-level providers and QI Leaders. The open house focused on Henry Ford West Bloomfield's success in reducing urinary retention rates and how the hospital implemented and sustained a very successful early ambulation program.

EXPANDING TO NEW AREAS AND INVOLVING PCPS

MSSIC is expanding the QI agenda to include a focus on one or more patient-reported outcomes, and to expand collaboration with primary care physicians in important areas such as opioid management. In preparation for a postoperative collaboration with PCPs, an **AT RISK FOR MEDICAL READMISSION (ARMR)** tool was developed by MSSIC staff to help surgeons determine which patients are at high risk for readmission. Surgeons will request that patients at high risk schedule an appointment to see their PCPs within 7-10 days of discharge for medical management and to catch exacerbations or complications early. The MSSIC ARMR tool was presented at the November collaborative-wide meeting and several surgeons volunteered to be involved with the pilot test, which started in February.

DISCLAIMER STATEMENT: Although Blue Cross Blue Shield of Michigan and MSSIC work collaboratively, the opinions, beliefs and viewpoints expressed by the author do not necessarily reflect the opinions, beliefs and viewpoints of BCBSM or any of its employees.

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MSSIC 2018 ACCOMPLISHMENTS

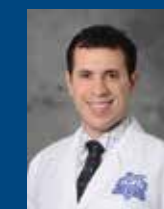
15.1% reduction in readmissions from 2017 to 2018 (from 8.1% to 6.9%)

43% reduction in urinary retention rate from 2017 to 2018 (from 8.5% to 4.8%)

18 Each hospital had a specific area of focus for a QI initiative in 2018. Of the 26 hospitals, 18 achieved or exceeded their improvement goal and five others made progress

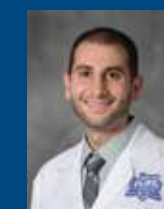
JOINT SPINE SECTION NATIONAL AWARDS

Two Henry Ford residents were recently awarded Charles Kuntz Scholar Awards from the American Association of Neurological Surgeons/Congress of Neurological Surgeons (AANS/CNS) Joint Spine Section. This is one of the most prestigious spine awards presented nationally throughout organized neurosurgery.



AMBULATION ON POD#0 IS ASSOCIATED WITH DECREASED ADVERSE EVENTS AFTER ELECTIVE LUMBAR SPINE SURGERY: ANALYSIS OF THE MICHIGAN SPINE SURGERY IMPROVEMENT COLLABORATIVE (MSSIC). AUTHOR: Hesham Zakaria, M.D.

FACULTY SPONSORS: Jason Schwalb, M.D., and the MSSIC team. **EDITOR'S NOTE:** This is the second year in a row that Dr. Zakaria has won this award.



DRIVERS OF EPISODE PAYMENTS FOR NON-CERVICAL SPINAL FUSION. AUTHOR: Mohamed Macki, M.D. **FACULTY SPONSORS:** Victor Chang, M.D., David Nerenz, Ph.D., and collaborators from the University of Michigan and the Michigan Value Collaborative.

MOHAMED MACKI, M.D.

DEPARTMENT AWARDED MOST RESEARCH GRANTS IN HISTORY

The Henry Ford Department of Neurosurgery has earned the most National Institutes of Health, Department of Defense and other sponsored research grants in our history - putting us in the top academic programs in the country based on research funding.

TARGETING ONCOGENE AMPLIFICATION IN GLIOBLASTOMA

AGENCY: Department of Defense (DOD) **PRINCIPAL INVESTIGATOR:** Ana deCarvalho, Ph.D. **CO-INVESTIGATOR:** Laila Poisson, Ph.D. **COLLABORATOR:** James Snyder, D.O.

TREATMENT OF TRAUMATIC BRAIN INJURY WITH VEPOLOXAMER

AGENCY: National Institutes of Health - Acute Neural Injury & Epilepsy (ANIE), National Institute of Neurological Disorders and Stroke (NINDS) **PRINCIPAL INVESTIGATOR:** Yanlu Zhang, M.D. **CO-INVESTIGATORS:** Ye Xiong, M.D, Ph.D., Quan Jiang, Ph.D., Michael Chopp, Ph.D., Mei Lu, Ph.D.

EPIGENOMIC MASTER REGULATORS THAT DEFINES IDH1/2 MUTANT GLIOMA TUMOR PROGRESSION

AGENCY: Department of Defense (DOD) Idea Award **PRINCIPAL INVESTIGATOR:** Houtan Noushmehr, Ph.D. **CO-INVESTIGATORS:** Ana deCarvalho, Ph.D., Laila Poisson, Ph.D.

MOLECULAR AND CLINICAL EVALUATION OF THE GLIOMA PATIENT EXPERIENCE TO ANTICIPATE MODERN OUTCOMES AND GUIDE PATIENT CARE

AGENCY: National Institutes of Health - National Cancer Institute **PRINCIPAL INVESTIGATOR:** Laila Poisson, Ph.D., in collaboration with Public Health Sciences **CO-INVESTIGATORS (NEUROSCIENCE RESEARCH):** Ana deCarvalho, Ph.D., Houtan Noushmehr, Ph.D. **CO-INVESTIGATOR (NEURO-PATHOLOGY):** Abir Mukherjee, Ph.D. **CLINICAL SUPPORT:** Steven N. Kalkanis, M.D., Tom Mikkelsen, M.D., Tobias Walbert, M.D., Ph.D., James Snyder, D.O.

MRI SIGNATURES OF RESPONSE TO HIGH-DOSE RADIOTHERAPY IN RAT MODELS OF CEREBRAL TUMOR

AGENCY: National Institutes of Health, National Cancer Institute **CO-PRINCIPAL INVESTIGATORS:** James R. Ewing, Ph.D., Steven L. Brown, Ph.D., in collaboration with Neurology Research - Nuclear magnetic resonance (NMR) **CO-INVESTIGATORS (NEUROSCIENCE RESEARCH):** Ana deCarvalho, Ph.D., Tavarekere Nagaraja, Ph.D. **CO-INVESTIGATOR (PUBLIC HEALTH SCIENCES):** George Divine, Ph.D.

EXOSOME-BASED THERAPEUTICS IN TRAUMATIC BRAIN INJURY (TBI)

AGENCY: National Institutes of Health - National Institute of Neurological Disorders and Stroke (NINDS) **PRINCIPAL INVESTIGATOR:** Ye Xiong, M.D., Ph.D. **CO-INVESTIGATORS:** Michael Chopp, Ph.D., Asim Mahmood, MBBS, Yi Zhang, Ph.D., Mei Lu, Ph.D.

THERAPEUTIC USE OF BRYOSTATIN-1 TO EXTEND TPA TIME WINDOW FOLLOWING MCAO

AGENCY: National Institutes of Health - National Institute of Biomedical Imaging and Bioengineering (NIBIB) **SITE PRINCIPAL INVESTIGATOR:** Tavarekere Nagaraja, Ph.D. **PRINCIPAL INVESTIGATOR (UNIVERSITY OF WEST VIRGINIA):** Jason Huber, Ph.D., in collaboration with the University of West Virginia (Sub-Contract)

EXTRACELLULAR PH MAPPING AS THERAPEUTIC READOUT OF DRUG DELIVERY IN GLIOBLASTOMA

AGENCY: National Institutes of Health - National Institute of Biomedical Imaging and Bioengineering (NIBIB) **CONSORTIUM PRINCIPAL INVESTIGATOR:** Meser Ali, Ph.D. **PRINCIPAL INVESTIGATOR (YALE UNIVERSITY):** D.S. Fahmeed Hyder, Ph.D., in collaboration with Yale University (Sub-Contract)

TREATMENT OF GLIOMA WITH NANOCOMBRETASTATIN WITH MRI MONITORING

AGENCY: National Institutes of Health - National Cancer Institute (NCI) **PRINCIPAL INVESTIGATOR:** Meser Ali, Ph.D. **CO-INVESTIGATORS:** James R. Ewing, Ph.D., Steven Brown, Ph.D., Ana deCarvalho, Ph.D., Li Zhang, Ph.D., Tom Mikkelsen, M.D.

WSU MICHIGAN TRANSLATIONAL RESEARCH AND COMMERCIALIZATION PROGRAM (MTRAC)

AGENCY: Wayne State University **PRINCIPAL INVESTIGATORS:** Steven N. Kalkanis, M.D., in collaboration with Wayne State University, including Gregory Auner, Ph.D., and Michelle Brusatori, Ph.D.

TARGETING CELL CYCLE CHECKPOINTS IN GLIOMA

AGENCY: Canadian Institutes for Health Research **PRINCIPAL INVESTIGATOR:** Lisa Porter, Ph.D. (University of Windsor), in collaboration with the University of Windsor **CO-INVESTIGATOR:** Ana deCarvalho, Ph.D.

DETECTION OF PITUITARY TUMOR EPIGENETIC MARKERS FROM CELL FREE DNA OBTAINED BY A NONINVASIVE LIQUID BIOPSY

AGENCY: Henry Ford Health System - Proposal Development Grant **PRINCIPAL INVESTIGATOR:** Anavaleria Castro, M.D., Ph.D. **NEUROSURGERY RESIDENT:** Karam Asmaro, M.D. (**AGENCY:** Henry Ford Health System - Graduate Medical Education Research Grant Award)

CHARACTERIZATION OF BLOOD-BRAIN BARRIER DISRUPTION ASSOCIATED WITH LASER INTERSTITIAL THERMAL THERAPY FOR HIGH GRADE GLIOMA

AGENCY: Henry Ford Health System - Physician Scientist Grant **PRINCIPAL INVESTIGATOR:** Ian Lee, M.D. **CO-INVESTIGATORS:** Tavarekere Nagaraja, Ph.D., James R. Ewing, Ph.D., Tobias Walbert, M.D., Ph.D., Brent Griffith, M.D. **MENTOR:** Panos Varelas, M.D., Ph.D.

SOUTHEAST ASIA PROJECT EXPANDS

TO REFER A PATIENT, GO TO henryford.com/neuro or call (313) 916-1340

Team members from Henry Ford Neurosurgery, led by Jack Rock, M.D., recently completed two more trips to Yangon, Myanmar. Dr. Rock has worked for years in the developing nation to advance neuroscience and make the field of neurosurgery more accessible in several ways.

This includes providing education and hands-on training for neurosurgical procedures through a "boot camp" - an intense two-day training session featuring a combination of lectures, case discussions and skill stations.

On one of the recent trips, a Henry Ford Neurosurgery resident, Dr. Karam Asmaro, accompanied the team and blogged about his experience (<https://bit.ly/2U7NO4c>).

The project continues to expand, most recently adding a second boot camp and introducing local residents to new research opportunities. The department also is working in conjunction with the HFH Global Health Initiative (GHI) to officially establish the International Program.

BRAIN TUMOR CENTER RECEIVES FUNDRAISER DONATION

In December 2018, the Cardillo family organized a local fundraiser that resulted in a nearly \$7,000 donation to the Hermelin Brain Tumor Center.

The Cardillo family knows what it's like to get a shocking diagnosis - times two. In 2014, Dominic Cardillo had a grand mal seizure, was diagnosed with a brain tumor and underwent a craniotomy at Henry Ford Hospital. A few years later, his wife Lisa experienced a sudden heart attack that left her in a coma for five days.

For years, the family has paid it forward by donating gifts to families battling similar conditions. During the 2018 holiday season, the Cardillos added a new element when they organized and hosted a fundraiser at a local pub owned by Dominic's parents.



HOOR DETROIT AWARDS HENRY FORD NEUROSURGEONS

In October 2018, Hour Detroit Magazine presented Henry Ford Health System with an Excellence in Care Award for treating brain tumor patient Tiffany Crowe with Modus V™ and BrightMatter™ Plan and Guide.

When most teenagers were preparing for college, Tiffany Crowe was preparing for her first brain cancer surgery. Over the course of the next decade she underwent five operations, chemotherapy and radiation to keep the cancer at bay. Then it stubbornly returned, this time in an area of the brain that made surgery more perilous with the potential to leave her with permanent left-side extremity weakness. Drs. Ian Lee, Tobias Walbert and Steven N. Kalkanis used the BrightMatter system to identify the brain's white matter tracts and removed the tumor without affecting her motor skills.

Henry Ford Hospital was the first in Michigan to offer BrightMatter, a robot-assisted brain surgery system, which helps surgeons preserve parts of the brain important for body movement, speech, strength and vision. It provides highly detailed images of the brain, as close

as an actual red blood cell traveling through an artery. A high-powered digital microscope has a larger and deeper field of view, and more natural color. Diffusion tensor imaging (DTI), previously only available for research purposes, gives visuals of complex white matter tracts in the brain.

Today, Henry Ford neurosurgeons use advanced technology, in conjunction with precision medicine, to perform less invasive procedures with more accuracy. It also makes brain surgery safer, with fewer complications, less postoperative pain and shorter recovery time.

MOST "TOP DOC" AWARDS IN HISTORY

Henry Ford also earned almost half of the total 2018 Hour Detroit "Top Doc" awards for the Neurosurgery category, the most in the department's history. In addition, Dr. Rock and Dr. Kalkanis shared this year's honor of the top vote-getters in neurosurgery.



GROWING SKULL BASE CENTER OFFERS ADVANCED TREATMENT

In the last four years, we have formalized the Henry Ford Skull Base, Pituitary and Endoscopy Center. We treat all types of skull base conditions.



JACK ROCK, M.D., FACS



JOHN CRAIG, M.D.



ADAM ROBIN, M.D.

Led by Co-Directors Jack Rock, M.D., FACS (Neurosurgery) and John Craig, M.D. (Otolaryngology) and Senior Staff Neurosurgeon Adam Robin, M.D., the center offers patients

a guaranteed appointment with a neurosurgeon or otolaryngologist within 24 business hours.

EXPERT, MULTIDISCIPLINARY CARE

Our team also includes experts from ophthalmology, endocrinology, plastics, medical oncology, radiation oncology and interventional neuroradiology – providing multidisciplinary, coordinated care for those patients who need it. Our surgical team offers special expertise in skull base reconstruction, which improves functional and cosmetic outcomes, and reduces the risk of postoperative cerebrospinal fluid leaks and infection.

In addition, each new tumor case is reviewed by our multidisciplinary Skull Base Tumor Board to determine the best treatment options for the patient, which may include surgery, tumor embolization or stereotactic radiation therapy. Our program also utilizes the most advanced minimally invasive endoscopic approaches and image-guided surgical navigation systems, including intraoperative MRI.

SKULL BASE AND INTRACRANIAL TUMORS

We offer diagnosis and treatment for all types of skull base and intracranial tumors, as well as related conditions, including:

- Acoustic neuroma (vestibular schwannoma)
- Adenoma
- Cerebrospinal fluid leak
- Chondroma
- Chondrosarcoma
- Chordoma
- Craniopharyngioma
- Encephaloceles
- Fibrous dysplasia
- Giant cell tumor
- Hemangiopericytoma
- Meningioma
- Metastatic brain tumors
- Nasopharyngeal angiofibroma
- Neurofibroma
- Olfactory neuroblastoma (esthesioneuroblastoma)
- Osteoma
- Paranasal sinus cancer
- Petrous apex lesions
- Rathke's cleft cyst
- Rhabdomyosarcoma

MICHIGAN'S FIRST PATIENT TREATED WITH DBS FOR EPILEPSY

A Grayling-area man is the first in Michigan with a complete deep brain stimulation (DBS) system surgically implanted for the treatment of epilepsy.

Neurosurgeon Jason Schwalb, M.D., with help from the team at the Henry Ford Comprehensive Epilepsy Center, implanted targeted electrodes in 32-year-old Steven Rennie's brain on February 12, and a pacemaker-like device known as an internal pulse generator in his chest on February 28.

The electrodes are attached to the internal pulse generator, their power source, via thin extension cords below the skin. Together, these components make a complete DBS system – something that provides hope for Rennie, who has not seen a significant reduction in symptoms from other epilepsy treatments.

Rennie's journey with epilepsy began at age 24 when he experienced his first seizure while sleeping. His mother discovered him having the seizure, and she quickly rushed him to the nearest emergency room. He spent the next year seizure-free before having his second on October 30, 2012 – exactly one year to the day after his first. Shortly afterward, he was diagnosed with epilepsy.

A LONG JOURNEY

In the time since his diagnosis, Rennie has experienced more than 200 seizures, sometimes up to eight in one day. While some are severe and debilitating, others are so mild that he isn't aware he is having one.

"The seizures can be very hit-or-miss," Rennie says. "I underwent surgery to place electrodes on my brain at Henry Ford Hospital so my doctors could monitor my brain activity when a seizure happened. For two weeks, I did not have a single seizure. I then had to go back to the operating room to have the electrodes removed. The day after I went home, I had one."

For many epilepsy patients, medication or a Vagus Nerve Stimulator can provide a significant reduction in the frequency and severity of seizures. For Rennie, these provided only moderate relief, and it was

clear that he needed a different option. Thanks to the FDA's approval of anterior nucleus of the thalamus (ANT)-DBS for the treatment of localization-related epilepsy, and the expert team at the Henry Ford Comprehensive Epilepsy Center, Rennie now has a promising alternative.

"From the initial clinical trial that was done in the U.S., long-term results showed that 70 percent of patients had a greater than 50 percent reduction in how frequently they were having seizures," Dr. Schwalb says. "We are optimistic that Mr. Rennie will see significant improvement from DBS. However, it may take a couple of years to determine exactly how effective DBS is for him."

UNDERTREATMENT: A WIDESPREAD PROBLEM

The ideal treatment for localized-related epilepsy that does not respond to medication or Vagus Nerve Stimulation is resective surgery to remove the part of the brain causing the seizures. Unfortunately, this is an underutilized option. In Rennie's case, tests have not been able to determine exactly where within the brain his seizures originate, ruling out the possibility of resective surgery.

"In the U.S., there are 100,000 patients every year who would benefit from epilepsy surgery, but there are only 4,500 epilepsy surgical procedures performed each year," Dr. Schwalb says. "Less than five percent are getting the appropriate surgery. For a patient who has three grand mal seizures per year, the likelihood that the patient will die from epilepsy within a decade is 15 percent. That's higher than some cancers."

Anyone who has two or more seizures per year with altered levels of consciousness – not knowing what is going on, or not remembering what happened during the seizures – after two appropriately chosen medications at appropriate doses, should be considered for epilepsy surgery, Dr. Schwalb says.

If surgery is not an option, such as in Rennie's case, treatments such as DBS may significantly improve symptoms and reduce the damage caused by seizures.

PROGRAM HIGHLIGHTS

INCREASED VOLUME OF COMPLEX ENDOSCOPIC SKULL BASE SURGERIES

Excellent results with very low complication rates

DECREASED LENGTH OF HOSPITAL STAY

Since adopting endoscopic surgical approaches for skull base tumors

ANNUAL FALL SKULL BASE SURGERY SYMPOSIUM

A multidisciplinary day of lectures about the complex management of patients with skull base pathology

ANNUAL SKULL BASE SURGERY LECTURE AND CADAVER DISSECTION COURSE

This successful spring course invites outside speakers from across the country who help with the dissection lab

RESEARCH

We collect all preoperative, intraoperative and postoperative data prospectively in an online database, and follow all of our patients for life

1,000

patient visits annually

200

new consultations each year

24

hours or less guarantee to see skull base specialist, from time of initial consultation



STROKE CENTER OFFERS EXPERT CARE, DRIVES INNOVATION

Ischemic and hemorrhagic stroke patients referred to Henry Ford have access to the most advanced technology and specialized treatment available day or night, and a uniquely educated and highly trained team prepared to act at a moment's notice.

LEADING ON NEUROENDOVASCULAR TREATMENT

The neuroendovascular surgery service, led by neurointerventional experts Max Kole, M.D., and Horia Marin, M.D., is one of the main drivers of our Comprehensive Stroke Center designation. The unique clinical and invasive nature of this subspecialty requires special training and skills. It is essential for neurosurgeons, neurologists and neuroradiologists to gain experience in this rapidly evolving field, which is why Henry Ford has been working to develop a new neuroendovascular fellowship.

NEUROENDOVASCULAR FELLOWSHIP

This fellowship has been approved by the Henry Ford Graduate Medical Education Committee (GMEC) and will be accredited by The Society of Neurological Surgeons (SNS) Committee on Accreditation of Subspecialty Training (CAST) and administered by the sponsoring Henry Ford Hospital Neurological Surgery Program. The goals and objectives will align with the CAST program and ACGME regulations.

The new fellowship is designed to give fellows an organized, comprehensive, supervised, full-time educational experience in

neuroendovascular therapy. The fellowship will be one or two years depending on the prerequisite training of the entering fellow. Fellows will be selected from neurosurgical, neurological and neuroradiologic backgrounds as per the CAST common program guidelines. The core neuroendovascular surgery faculty are Dr. Kole, a fellowship-trained dual endovascular cerebrovascular neurosurgeon, Dr. Marin, a fellowship-trained interventional neuroradiologist, and Alex Chebl, M.D., a neurovascular/endovascular trained neurologist. Dr. Kole will serve as the program director and Drs. Marin and Chebl as associate program directors.

HENRY FORD HONORED WITH QUALITY AWARDS

The American Heart Association/American Stroke Association once again awarded our center a **GET WITH THE GUIDELINES® STROKE GOLD PLUS QUALITY AWARD**, indicating excellence in clinical volume, outcomes and quality metrics, as well as the **TARGET: STROKE HONOR ROLL ELITE AWARD** for exceeding time targets for stroke treatment.

2018 DETROIT STROKE CONFERENCE

In November 2018, the Henry Ford Neuroscience Institute hosted its 2nd Annual Detroit Stroke Conference, which focused on all aspects of stroke management. Several experts from Henry Ford shared advancements in diagnosing, treatment and post-stroke care to a crowd of about 300, using TED-style talks. The conference also featured four keynote presentations from other stroke leaders around the country:

- **CT ON WHEELS: MOBILE STROKE UNITS:** Andrei Alexandrov, M.D., University of Tennessee Health Science Center
- **COMPETENCE AND CONFIDENCE: ENSURING EXCELLENT STROKE NURSING CARE:** Anne Alexandrov, Ph.D., University of Tennessee Health Science Center
- **MINIMALLY INVASIVE SURGERY FOR INTRACEREBRAL HEMORRHAGE:** Christopher Kellner, M.D., Mount Sinai Hospital
- **INNOVATIONS IN STROKE CARE:** Osama Zaidat, M.D., Mercy Health St. Vincent

Henry Ford Neuroendovascular Experts



MAX KOLE, M.D.

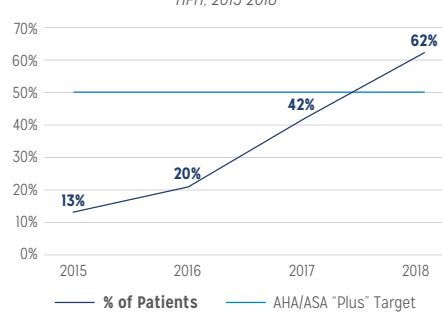


HORIA MARIN, M.D.

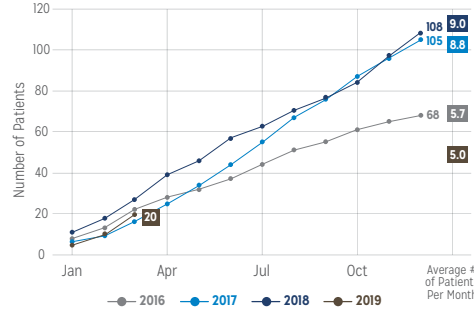


ALEX CHEBL, M.D.

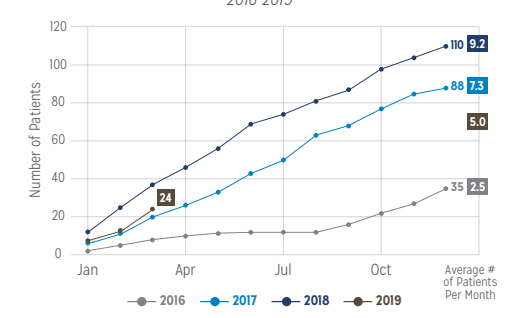
Percent of Patients with Door to IV tPA ≤ 45 Minutes
HFH, 2015-2018



HFH IV tPA Volume - All Patients
2016-2019

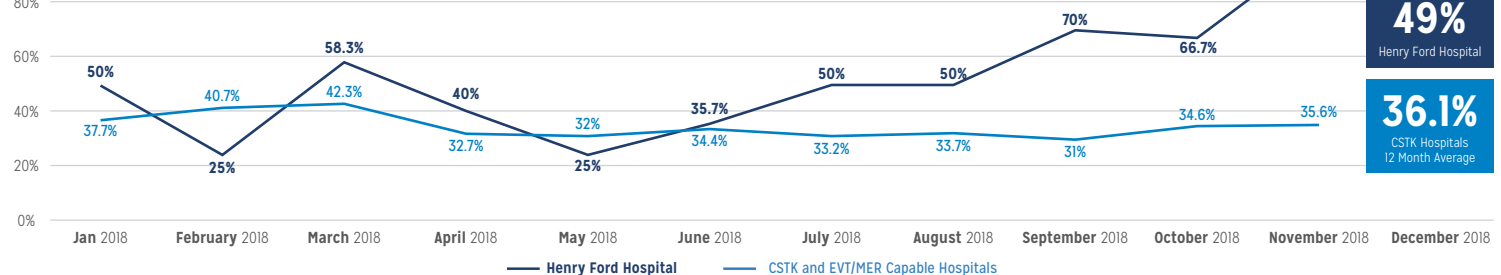


HFH Endovascular Stroke Treatment Patient Volume
2016-2019



CSTK-10

Modified Rankin Score
(mRS at 90 Days: Favorable Outcome)



Numerator Statement: Ischemic stroke patients treated with IV or IA therapy with an mRS less than or equal to 2 at 90 days (>75 days and <105 days)
Denominator Statement: Ischemic stroke patients treated with IV or IA therapy or who undergo mechanical endovascular reperfusion therapy

	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018	12 Month Average
HENRY FORD HOSPITAL													
Percent of Patients	50.0%	25.0%	58.3%	40.0%	25.0%	35.7%	50.0%	50.0%	70.0%	66.7%	100.0%		49.0%
Numerator	5	4	7	4	1	5	3	3	7	4	6		49
Denominator	10	16	12	10	4	14	6	6	10	6	6		100
CSTK AND EVT/MER CAPABLE HOSPITALS													
Percent of Patients	37.7%	40.7%	42.3%	32.7%	32.0%	34.4%	33.2%	33.7%	31.0%	34.6%	35.6%		36.1%
Numerator	371	385	359	171	179	189	163	147	182	189			2498
Denominator	984	946	848	523	559	550	491	483	474	526	531		6915

PROGRAM HIGHLIGHTS

2,600

stroke patients in 2018

298

patients received thrombolytic therapy from 2017 to 2018

214%

increase in patients treated with endovascular stroke treatment from 2017 to 2018

84%

successful reperfusion after endovascular stroke treatment

35

active stroke studies



Robert H. Rossenwasser, M.D., delivers the 2019 Malik Lecture.

RENOWNED NEUROSCIENCE SPEAKERS PRESENT IN DETROIT

Our department is proud to offer several lectures and other speaking programs to help foster communication and collaboration in our field.

In October, we hosted the 2018 Rosenblum Lectureship in Neurosurgery, an annual series established in honor of Henry Ford Neurosurgery Chair Emeritus Mark D. Rosenblum, M.D. The featured speaker, Edward R. Laws, M.D., presented on **VIRTUOSITY IN SURGERY AND NEUROSURGERY**. Dr. Laws is a past President of the Congress of Neurological Surgeons, the American Association of Neurological Surgeons (AANS) and the American College of Surgeons.

In March, we hosted our 2019 Malik Lectureship in Neurosurgery, an annual series established in honor of Ghaus Malik, M.D., Vice Chairman and Director of the Henry Ford Neurovascular Program. The featured speaker, Robert H. Rosenwasser, M.D., completed fellowships in both neurovascular surgery and interventional neuroradiology, and has served in many prominent roles, including division chief of cerebrovascular surgery and interventional neuroradiology at Thomas Jefferson University Hospital. In 2004, he was appointed as chair of the Department of Neurological Surgery at Jefferson.

Other recent speaking events we have hosted included visits by opera singer Renée Fleming (see opposite page), AANS President Shelly Timmons, M.D., Ph.D., and Deborah Benzil, M.D., FACS, FAANS – who was a founding member and the first president of Women in Neurosurgery. Dr. Benzil is known nationally for her work in spine stereotactic radiosurgery, innovation in resident education, and socioeconomic expertise.



TOP: (from left) Henry Ford Neurosurgery Resident Lara Massie, M.D., with Henry Ford Neurosurgeon Jason Schwalb, M.D., Rosenblum Lecturer Edward R. Laws, M.D., and Henry Ford Neurosurgeon Mokbel Chedid, M.D. BOTTOM: (from left) Henry Ford Neurologist Alex Chebl, M.D., and Neurosurgeon Ghaus Malik, M.D., with Malik Lecturer Robert H. Rossenwasser, M.D.



Opera singer Renée Fleming is passionate about the central importance of music and the arts in our society. Inspired by the Sound Health initiative she spearheads at the John F. Kennedy Center for Performing Arts in Washington, D.C., Fleming has created a presentation called **MUSIC AND THE MIND**, which explores the power of music as it relates to health and the brain.

Topics include childhood development, music therapy and cognitive neuroscience.

As part of her presentations, Fleming invites experts around the country to present their research and discuss their experience in various related areas.

During her visit to Henry Ford, Jason Schwalb, M.D., co-director of the Functional Neurosurgery Program at Henry Ford, presented on medical care for chronic tinnitus, including the types and the potential effects of this debilitating condition on a person's quality of life.



FROM LEFT: Jeffrey Stanley, Ph.D. (Wayne State University), Tanja Jovanovic, Ph.D (Wayne State), Eva Feldman, M.D., Ph.D. (University of Michigan), Peter LeWitt, M.D., Renée Fleming, Jason M. Schwalb, M.D., Steven N. Kalkanis, M.D., Devon Hoover, M.D. (Ascension St. John Hospital), Jun Li, M.D., Ph.D. (Wayne State), William Kupsky, M.D. (Wayne State) and Wayne S. Brown (President and CEO of Michigan Opera Theatre).

Mark L. Rosenblum, MD
Neurosurgery Library



TWO RESIDENTS PERFORM GROUNDBREAKING RESEARCH

Introducing research methodology into the neurosurgical training program is a focus of the curriculum in the Henry Ford Department of Neurosurgery.

The outcome of this strategy has featured a tremendous increase in the number of resident publications from the department, as well as regional and national awards for the research work and the residents themselves. Not only does this provide research design, implementation and documentation in the form of manuscript experience and increased knowledge and exposure to details of neurosurgical treatment to the trainees, it also opens new areas of research within the neurosurgical community at large.

Two Henry Ford residents, Dr. Lara Massie (PGY-7) and Dr. Hesham Zakaria (PGY-6), have explored and provided groundbreaking research in the fields of anatomical variations in human anatomy that may predict the propensity for certain outcomes – desirable and undesirable – in patients presenting for neurosurgical treatments.

BREAST SIZE AND SPINAL OUTCOMES

Dr. Massie's area of interest is in the field of female breast size as an indicator of outcomes in spinal surgery. For plastic surgeons whose patients are seeking breast reduction, one of the key indicators for that surgery is spinal pain. According to Dr. Massie and her co-investigators,

“In female patients undergoing spine surgery, the impact of body habitus on outcome is an underappreciated factor and one that appears to influence patient satisfaction significantly.”

“In the setting of legitimate spinal pathology, female patients with macromastia are significantly less likely to reach a minimal clinically important difference in their disability than their peers, despite having an equivalent preoperative level of disability. Furthermore, musculoskeletal back pain related to macromastia is a well-established finding, and patients with back pain without surgical spinal

pathology may benefit from referral to physiatry or plastic surgery for consideration of reductive mammoplasty.”

“Simply asking patients to report their bra cup size on intake forms may be a reliable indicator of breast volume, making identification of those who may qualify for reductive mammoplasty (D cup and above) identifiable to spine surgeons without significantly adding to visit time or provider discomfort. These findings could be a point of discussion for any spine surgeon offering surgery to female patients.”

PSOAS MUSCLE SIZE AND SPINAL CANCER

Dr. Zakaria has looked extensively into the relationship between the size – usually reduced – of the psoas muscle around the spines of patients with various kinds of spinal cancer. This decreased size of the muscle tissue is referred to as “sarcopenia,” and has been explored in other areas of medicine, but not previously in spinal-related disease. In the era of precision medicine, there has been a concerted effort to establish predictors of outcomes in clinical patients, leading to the establishment of risk calculators, many of which are not applicable to neurological surgery. Currently, most neurosurgeons rely on intuition, or the “eyeball” test, where they look at patients to determine fitness for surgery.

Dr. Zakaria and colleagues were interested in assessing whether they could identify a more objective way of determining patient likelihood for desired outcomes with surgery. Recent studies have shown that patient frailty (i.e., lack of resistance to physiologic stressors) is one of the key markers predicting lack of surgical success and is strongly associated with lack of muscle mass (i.e., sarcopenia).

In patients with spine metastases, Dr. Zakaria showed that sarcopenia is able to predict overall survival more strongly than current means. Further, he and his colleagues applied this method to patients with glioblastoma and were able to show that it was again a simple, preoperative and independent predictor of survival.

BEVERLY C. WALTERS, M.D., MSC, FRCSC, FACS

Director of Clinical Research, Henry Ford Department of Neurosurgery

CLINICAL TRIALS

The Henry Ford Department of Neurosurgery is active in clinical research, and is currently offering these prospective clinical trials as a treatment option. For more information about these or other current studies, please call (313) 916-1756.

BRAIN TUMORS

ABTC 1202: Phase I Study of MK-1775 with Radiation and Temozolomide in Patients with Newly Diagnosed Glioblastoma and Evaluation of Intratumoral Drug Distribution in Patients with Recurrent Glioblastoma

ABTC 1301: Pilot Study of MLN0128 in Preoperative Recurrent Glioblastoma (GBM) Patients

ABTC 1302: Drug Distribution and Pharmacodynamics Study of Pulsatile Lapatinib in Surgically Accessible EGFR-Amplified Recurrent High-Grade Glioma

ABTC 1401: Phase 1 Dose Escalation and Drug Distribution Study of Oral Terameprocol in Patients with Recurrent High Grade Glioma

ABTC 1403: A Phase I and Pilot Study of the Effect of rhIL-7-hyFc (NT-17) on CD4 Counts in Patients with High Grade Gliomas and Severe Treatment-Related CD4 Lymphopenia after Concurrent Radiation and Temozolomide

ABTC 1501: A Phase I Trial of Anti-LAG-3 or Anti-CD137 Alone and in Combination with Anti-PD-1 in Patient with Recurrent GBM

ABTC 1601: A Phase I Study to Determine the Safety and Tolerability of the Oral Microtubule Destabilizer BAL101553 in Combination with Standard Radiation in Patients with MGMT Promoter Unmethylated Newly Diagnosed Glioblastoma

ABTC 1602: Single-arm, Open-label Phase II Efficacy Study of First-in-class HIF2-Alpha Inhibitor, PT2385, for Patients with Recurrent Glioblastoma

ABTC 1603: Testing the Safety of Combining an Immune Stimulator (GMCI), the Anti-cancer Drug Nivolumab, and Radiation Therapy With or Without Temozolomide, in Patients with Newly Diagnosed High-grade Glioma

ABTC 1604: Phase 0/I Study of AMG 232 Concentrations in Brain Tissue in Patients with Recurrent Glioblastoma and of AMG 232 in Combination with Radiation in Patients with Newly Diagnosed Glioblastoma and Unmethylated MGMT Promoters

BGB-290-104: A Phase 1b/2 Study to Assess the Safety, Tolerability and Efficacy of BGB-290 in Combination with Radiation Therapy and/or Temozolomide in Subjects with First-line or Recurrent/Refractory Glioblastoma

Coping with Glioblastoma: A Study of Communication between Physicians, Patients, and Caregivers

DSP-7888: A Randomized, Multicenter, Phase 2 Study of DSP-7888 Dosing Emulsion in Combination with Bevacizumab versus Bevacizumab Alone in Patients with Recurrent or Progressive Glioblastoma following Initial Therapy

EAF151: Change in Relative Cerebral Blood Volume as a Biomarker for Early Response to Bevacizumab in Patients with Recurrent Glioblastoma

GBM-001: An Open-Label, Multi-center Trial of INO-5401 and INO-9012 Delivered by Electroporation (EP) in Combination with REGN2810 in Subjects with Newly Diagnosed Glioblastoma (GBM)

N-HFHS 14-04: Gliolan 5-ALA: A Multicenter Study of 5-Aminolevulinic Acid (5-ALA) to Enhance Visualization of Malignant Tumor in Patients with Newly Diagnosed or Recurrent Malignant Gliomas: A Safety, Histopathology, and Correlative Biomarker Study

OT-15-001: Phase 3, Randomized, Open-label Study To Evaluate the Efficacy and Safety of Eflornithine with Lomustine Compared to Lomustine Alone in Patients with Anaplastic Astrocytoma That Progress/Recur After Irradiation and Adjuvant Temozolomide Chemotherapy

RTOG 1119: Phase II Randomized Study of Whole Brain Radiotherapy in Combination with Concurrent Lapatinib in Patients with Brain Metastasis From HER2-Positive Breast Cancer; a Collaborative Study of RTOG and KROG

Tg511-15-01: A Phase 2/3 Randomized, Open-Label Study of Toca 511, a Retroviral Replicating Vector, Combined with Toca FC versus Standard of Care in Subjects Undergoing Planned Resection for Recurrent Glioblastoma or Anaplastic Astrocytoma

Vigilant Observation of Gliadel Wafer Implant (VIGILANT) Registry: A Multicenter, Observational Registry to Collect Information on the Safety and Effectiveness of Gliadel® Wafer (Carmustine Implant) Used in Usual Medical Practice

IRB 9936: Validity and Reliability of Self-Reported Karnofsky Performance Status

IRB 10722: NeMeRe, a Multi-Institutional Retrospective and Prospective Registry of Neoplastic Meningitis in Adults

IRB 10934: Quantification of the Blood Brain Barrier in Patients Receiving Laser Ablation Therapy

SPINE

IRB 7763: Mechanomyography for Evaluation of Pedicle Screw Placement (Sentio, LLC), Grant# E12101

IRB 9165: Three-Dimensional Motion Analysis in Patients' Status Post Anterior Cervical Fusion and Cervical Disc Arthroplasty, a Clinical Study_MOTION STUDY Supported by the Mentored Clinician Scientist program of HFHS)

IRB 9413: Application of LinkView Telemedicine Device in Senior Post-operative Spine Patients

IRB 10675: The Effect of Tizanidine on Post-operative Analgesia in Lumbar Decompression

IRB 10912: Genetic Basis of Diffuse Idiopathic Sclerosing Hyperostosis (DISH)

IRB 12228: Postoperative Pain and Opioid Use Following Spine Surgery

EPILEPSY

IRB 10701: Stereotactic Laser Ablation for Temporal Lobe Epilepsy (SLATE) Study

VASCULAR

IRB 11254: Decision Support System for Predictions of Aneurysm Rupture and DVT/VTE in Aneurysm Patients

PUBLICATIONS *(continued)*

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FACULTY SPOTLIGHT: JASON SCHWALB



JASON M. SCHWALB, M.D.

Dr. Schwalb is the Surgical Director of the Movement Disorder and Comprehensive Epilepsy Centers at Henry Ford Health System and Clinical Professor of Neurosurgery at Wayne State University. He also holds an appointment as a Research Scientist in the Center for Health Policy and Health Services Research at Henry Ford.

Dr. Schwalb's areas of interest include novel technologies in surgery for movement disorders and epilepsy, laser interstitial thermal therapy, robotic surgery, complex peripheral nerve surgery, normal pressure hydrocephalus, pain (including facial pain and cancer-related pain), racial and economic disparities, health care delivery, quality improvement and registry science. Some of his recent appointments, presentations and other accomplishments include:

- **VICE PRESIDENT OF MANS:** He was recently elected Vice President of the Michigan Association of Neurological Surgeons (MANS). Dr. Schwalb and other Henry Ford neurosurgeons – including Dr. Steven Kalkanis, Dr. Jack Rock and Dr. Ghaus Malik – have a long history of leadership at MANS.
- **PRESIDENT OF AANS/CNS JOINT SECTION ON PAIN:** In October 2017, Dr. Schwalb was elected President of the AANS/CNS Joint Section on Pain. He previously served as the section's Vice President, a position he held since 2015. In March 2019, Dr. Schwalb presided over the Joint Section on Pain 2019 Biennial Meeting in Miami: [EXPANDING YOUR TOOLBOX: THE TREATMENT OF SPINE AND PERIPHERAL NERVE DISORDERS](#). The event featured leaders in the field – including Dr. Ellen Air – who discussed cutting-edge pain technologies, novel surgical techniques and the science to support them.
- **AMA PAIN CARE TASK FORCE:** Dr. Schwalb also was recently appointed to serve as a member on the newly formed American Medical Association Pain Care Task Force, representing all of organized neurosurgery at the national level.
- **NATIONAL GUIDELINES:** Having participated in the formation of National Guidelines in the treatment of Normal Pressure Hydrocephalus ([PMID: 26644048](#)), occipital neuralgia ([PMID: 26125672](#)) and deep brain stimulation for Parkinson's Disease ([PMID: 29538685](#)), Dr. Schwalb has been appointed Vice Chair of the Guidelines Committee of the American Society for Stereotactic and Functional Neurosurgery, where they are currently working on developing guidelines on best practices in epilepsy surgery. Through his role as President of the Joint Section on Pain, Dr. Schwalb is finalizing guidelines on neuroablative procedures for cancer pain and starting the process on guidelines for spinal cord stimulation, which will be led by Dr. Air.
- **CHAIR, FNSWG, PARKINSON STUDY GROUP:** Dr. Schwalb is the Chair of the Functional Neurosurgery Working Group (FNSWG) of the Parkinson Study Group (PSG), the first neurosurgeon to hold that position. The FNSWG has the largest membership of any working group of the PSG and has spearheaded the formation of the Registry for the Advancement of DBS in Parkinson's Disease (RAD-PD), along with the NeuroPoint Alliance. This effort ([rad-pd.org](#)), supported by the Michael J. Fox Foundation, is a quality improvement patient registry in the United States and Canada, representing a new era of investigation into DBS therapy for Parkinson's Disease. Henry Ford will be participating as a Tier 1 center and start contributing patients this year. Much of the development was based upon lessons learned from the Michigan Spine Surgery Improvement Collaborative (*See related [MSSIC UPDATE](#) on p. 3*), where Dr. Schwalb is a co-Director and Chair of the Publications Committee. He also serves on the Steering Committee and as Chair of the Publications Committee of RAD-PD.

HASSENBUSCH AWARD: At the 2019 Texas Association of Neurological Surgeons (TANS) annual meeting, Dr. Schwalb was the Hassenbusch lecturer, presenting a talk entitled **DEFINING AND IMPROVING QUALITY IN THE NEUROSURGICAL TREATMENT OF PAIN.**



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