Department of Neurology Annual Report

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We are pleased to present the 2008-2009 Department of Neurology Annual Report. I hope that you find the information interesting and useful, and that it will help you understand the diverse activities in our department. As you can see from the table of contents, the report addresses all aspects of our academic missions. Publications by our faculty and residents during the academic year were strong, and our research funding has increased dramatically. Special areas of research focus are movement disorders, amyotrophic lateral sclerosis, cognitive disorders, and cerebrovascular disease. Our educational mission is also a very important component of our department, especially our residency and fellowships. Our faculty are also engaged in extensive medical student teaching, including lectures in the first and second year basic science courses, as well as the neurology clerkship. I should highlight that the neurology clerkship is one of the most popular and successful in the Penn State College of Medicine. We are also pleased to participate in the teaching and supervision of graduate students and postdoctoral fellows, and are proud of our continuing education programs for physicians and other healthcare professionals both at Hershey Medical Center and throughout Central Pennsylvania. During the course of the year we have also been privileged to have a number of nationally recognized visiting professors, usually in conjunction with our Friday afternoon Grand Rounds. In addition, many of our faculty members are invited to speak locally, nationally and internationally on subjects related to their expertise.

Our clinical mission has grown dramatically over the past several years, and graphic description of this growth is included. In addition to our general neurology outpatient clinics, we are pleased to provide services in almost all major subspecialties. We also operate a very busy inpatient general neurology service, and our dedicated stroke service has won a number of awards for excellence and outstanding outcomes. Our epilepsy monitoring unit provides state-of-the art diagnostic facilities for patients whose seizures are difficult to control, some of whom may benefit from epilepsy surgery.

The Department of Neurology is pleased to be affiliated with the Penn State Neuroscience Institute, which includes colleagues in other clinical departments (neurosurgery, psychiatry, radiology, pediatric neurology and nursing). The Neuroscience Institute has developed a number of research and clinical centers. Many of the research centers include extensive collaborations not only within the Neuroscience Institute, but throughout the College of Medicine and the University Park Campus.

I am pleased with the outstanding academic achievements of 2008-2009, and as a department, we are proud to present this annual report.

David C. Good, MD

Neurology Faculty and Midlevel Providers

Jayant Acharya, MD, DM
Professor and Director, Adult Epilepsy Program, Director, Epilepsy Monitoring Unit
Epilepsy

Vinita Acharya, MD
Assistant Professor
Epilepsy

Kerstin Bettermann, MD, PhD
Assistant Professor, Director, Vascular Program
Cerebrovascular Disease

Sergio Chacin, MD
Assistant Professor
Physical Medicine and Rehabilitation

Ashok Devasenapathy, MD
Assistant Professor
Cerebrovascular Disease

Paul Eslinger, PhD
Professor, Departments of Neurology, Neural and Behavioral Health, Pediatrics and Radiology (NMR Research), Director, Clinical Neuropsychology and Cognitive Neuroscience Program
Neuropsychology

Claire Flaherty-Craig, PhD
Assistant Professor, Clinical Neuropsychologist
Neuropsychology

David Gill, MD
Assistant Professor, Program Director, Neurology Residency Program
Cognitive Neurology

David Good, MD
Professor and Chair, Department of Neurology
Director of Neurorehabilitation
Cerebrovascular Disease

Everett Hills, MD, MS
Assistant Professor, Certified Flight Physician
Physical Medicine and Rehabilitation

Xuemei Huang, MD, PhD
Associate Professor, Neurology, Radiology, Neurosurgery, Kinesiology & Bioengineering
Director, Hershey Brain Analysis Research Center for Neurodegenerative Disorders
Movement Disorders

Milind Kothari, DO
Professor, Vice Chair of Neurology, Assistant Director, Neurology Residency Program
Neuromuscular Disorders

Mechelle Lewis, PhD
Assistant Professor, Departments of Neurology and Neurosurgery and Pharmacology
Movement Disorders

Max Lowden, MD
Instructor
General Neurology

Raymond Reichwein, MD
Associate Professor, Director of the Department of Neurology Stroke Program, Co-Director of PSU/HMC Institutional Stroke Program, Co-director of the Penn State Clinical Neuroscience Institute
Stroke Program
Cerebrovascular Disease

Stephen Ross, MD
Associate Professor, Director of Neurology Clinical Operations, Vice Chair for Clinical Affairs, Director of Grand Rounds
Headaches

Kevin Scott, MD
Assistant Professor, Director, Clinical Neurophysiology/Neuromuscular Program
Neuromuscular Disorders

Zachary Simmons, MD
Professor, Director of Neuromuscular Program and ALS Center
Neuromuscular Disorders

Stacy Stark, DO
Assistant Professor, Department of Neurology and Pediatrics
Program Director, Spinal Cord Injury
Physical Medicine and Rehabilitation

Thyagarajan Subramanian, MD
Professor, Departments of Neurology and Neural and Behavioral Science
Director, Movement Disorders Program
Movement Disorders

Richard Tenser, MD
Professor, Departments of Neurology and Microbiology, Former Chief of Neurology
Multiple Sclerosis

Gary Thomas, MD
Assistant Professor
Multiple Sclerosis

Anthony Turel, MD
Professor of Neurology, Vice Chairman of Clinical Trials
Multiple Sclerosis

Kala Venkiteswaran, PhD
Assistant Professor, Departments of Neurology and Neural and Behavioral Sciences
Movement Disorders

Neurology Faculty with Secondary Appointments

Reginald Adams, Jr., PhD
Assistant Professor of Psychology in the College of Liberal Arts at University Park and
Assistant Professor of Neurology in the College of Medicine at Hershey

William Cantore, MD
Associate Professor, Ophthalmology and Neurology

David Giampetro, MD
Assistant Professor of Anesthesiology and Neurology

Anthony Giordano, MD
Assistant Professor of Pediatrics and Neurology

Surya Gupta, MD
Assistant Professor of Pediatrics and Neurology

Frank Hillary, PhD
Assistant Professor of Psychology in the College of Liberal Arts at University Park and
Assistant Professor of Psychiatry and Neurology in the College of Medicine at Hershey

Sangam Kanekar, MD
Assistant Professor of Radiology and Neurology

Richard Mailman, PhD
Professor and College of Medicine Distinguished Senior Scholar in Pharmacology and Neurology

Robert Sainburg, PhD
Associate Professor of Kinesiology in the College of Health and Human Development at University Park and Associate Professor of Neurology in the College of Medicine at Hershey

Charles Specht, MD
Associate Professor of Pathology, Ophthalmology, Neurosurgery, and Neurology

William Trescher, MD
Associate Professor, Pediatrics and Neurology

Yakov Vorobeychik, MD
Assistant Professor, Anesthesia and Neurology

Midlevel Providers and Professional Nursing

Rebecca Brenner, PA-C
Physical Medicine and Rehabilitation

Diana Consoli, PA-C
General Neurology

Cathy McNew, CRNP, MS
Epilepsy

Kathy Morrison, MSN, RN, CNRN
Stroke Program Manager

Nancy Parson, PA-C
Epilepsy

Kimberly Perkins, RN, CCRC
Clinical Research Coordinator, Department of Neurology

Angelique Scicchitano, PA-C
Physical Medicine and Rehabilitation

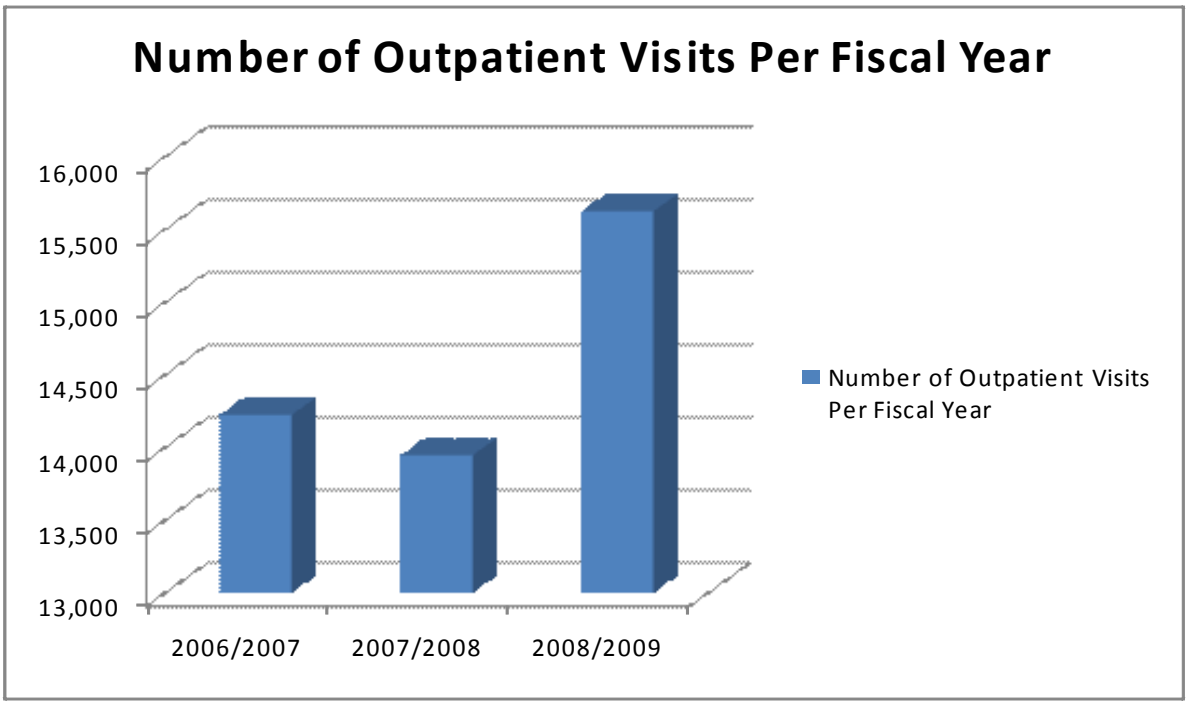
Clinical Achievements

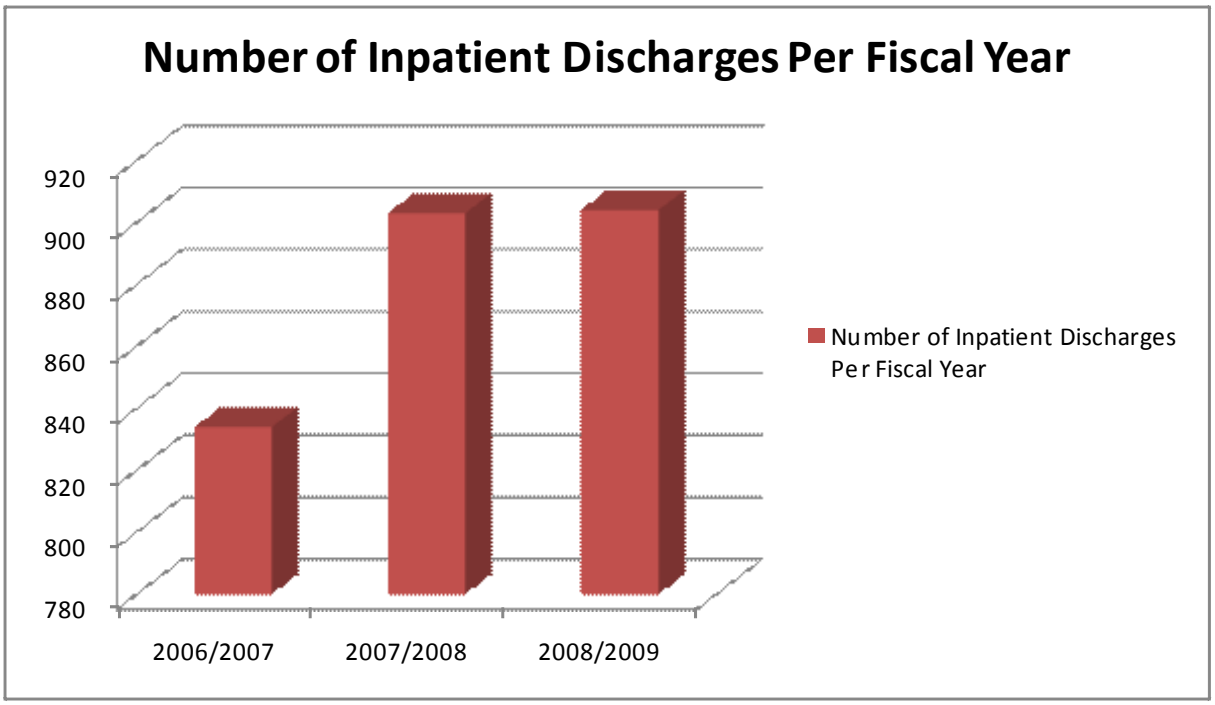
The Department of Neurology provides clinical outpatient services in general neurology and multiple neurological subspecialties. A list of faculty members and their subspecialty expertise are noted elsewhere in this document. We are pleased that five of our faculty were recently selected to "Best Doctors in America." Our clinic volumes have grown considerably since we moved into our new facility at 30 Hope Drive two years ago. Dr. Steve Ross, our Vice Chair for Clinical Affairs, works closely with our clinic staff. We are fortunate that our outpatient facility is adjacent to that of neurosurgery and rehabilitation, which facilitates true cross disciplinary care. In addition, a number of multidisciplinary specialty clinics are strengths of the department. The ALS clinic under Dr. Zach Simmons provides outstanding clinical care as well as the opportunity for ALS patients to participate in a variety of research projects. The memory disorders clinic under the supervision of Drs. David Gill , Paul Eslinger and Claire Flaherty-Craig is developing an outstanding reputation for interdisciplinary care of individuals with dementia and cognitive disorders. Our multiple sclerosis clinic under the direction of Drs. Gary Thomas, Rick Tenser and Tony Turel is held with staff support from the Central Pennsylvania Chapter of the National Multiple Sclerosis Society and also offers clinical trials for patients with MS. Drs. Xuemei Huang and T. Subramanian provide top notch care for patients with movement disorders, and are investigators in several clinical trials for Parkinson's disease. Our epilepsy program has grown with the addition of Drs. Jayant and Vinita Acharya, who supplement our two experienced midlevel providers, Cathy McNew and Nancy Michel. With the addition of a new pediatric epileptologist, and Dr. Michael Sather, our new epilepsy surgeon, the epilepsy program now provides cutting edge diagnosis and treatment for the most challenging patients in the area. The Neurophysiology Laboratory, under the direction of Dr. Zach Simmons, provides an array of important diagnostic procedures including electromyography (EMG), evoked potentials (EP's), routine electroencephalography (EEG) and extended EEG monitoring. Several of our physicians also provide botulinum toxin injections.

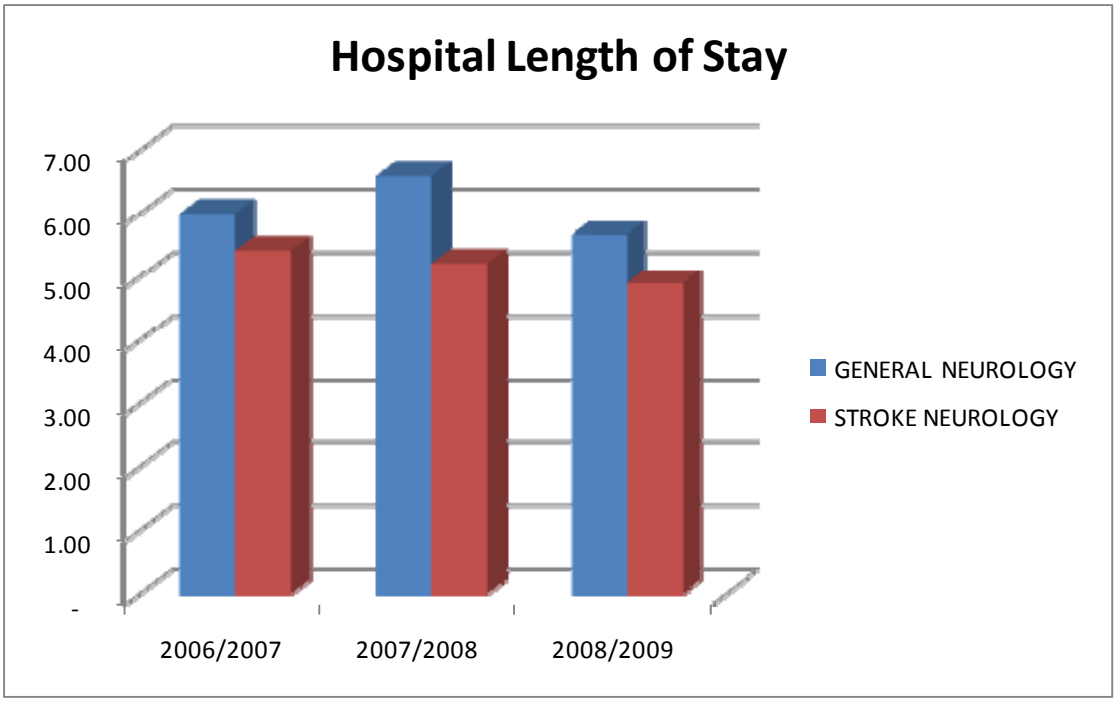
The inpatient neurology clinical program consists of the stroke service, and the general neurology/ consultation service. The stroke service, co-directed by Dr. Ray Reichwein from neurology and Dr. Kevin Cockroft from neurosurgery, has won awards for its comprehensive services and quality outcomes. The percentage of patients with acute stroke that receive tPA greatly exceeds the national average. Hershey Medical Center physicians provide interventional neuroradiological procedures as needed 24 hours a day. Seriously ill patients are admitted to the neurology inpatient service which includes ICU and IMC beds for intensive monitoring and high level treatment options. The stroke service maintains a comprehensive database for quality assessment and research. Our physicians are very concerned about secondary stroke prevention, and the stroke database has recently been extended to the outpatient clinic to ensure that all patients receive complete stroke prevention follow-up. Our Epilepsy Monitoring Unit (EMU), directed by Dr. Jayant Acharya, provides state of the art diagnostic services for complex patients with epilepsy. In addition to routine combined video and EEG monitoring, the unit has the capability for subdural and intracranial electrode placement for accurate localization of abnormal epileptogenic tissue prior to surgical resection. The epilepsy program continues to update its equipment to provide the most advanced diagnostic capabilities in Central Pennsylvania. A relatively new development is the emergence of the subspecialty of Neurocritical Care. Dr. Ashok Devasenapathy recently became board certified in this area and provides care and teaching in the neurosciences ICU.

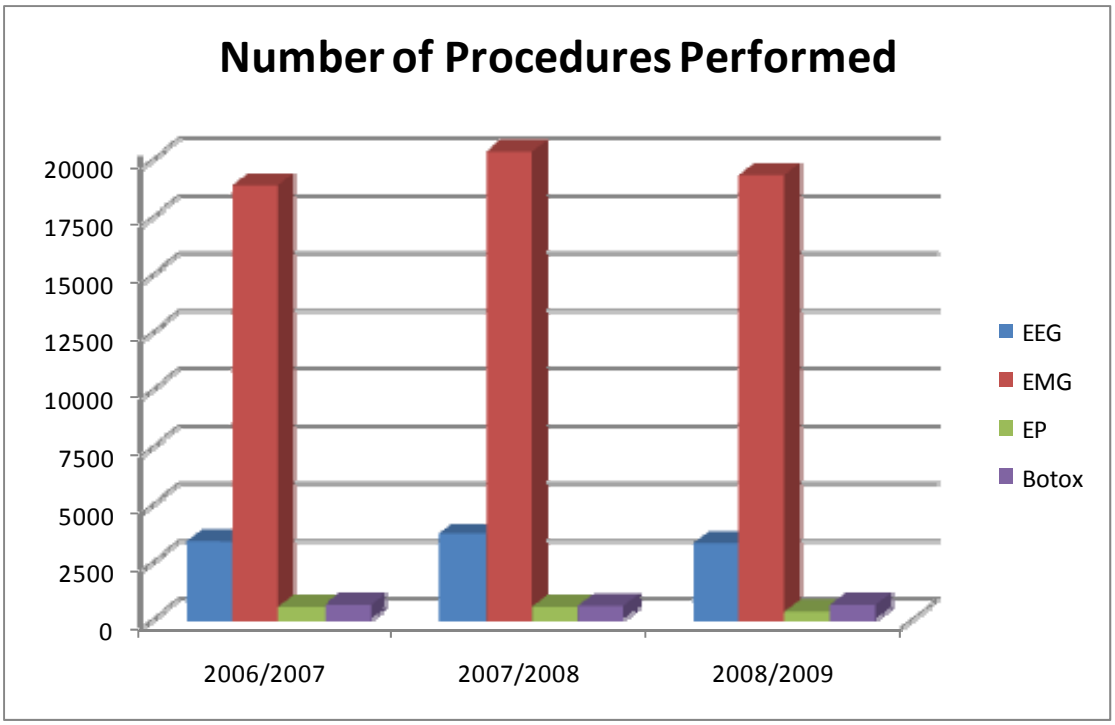
Our pediatric neurology group, led by Dr. Bill Trescher, and including Drs. Tony Giordano and Surya Gupta, is an important part of our department. In addition inpatient and outpatient clinical services, pediatric neurology plays an important role in the teaching mission.

In summary, both the outpatient and inpatient programs continue to increase in patient volume, and we are pleased with the high quality specialty care that is provided to our patients. With the opening of 30 Hope Drive two years ago our outpatient capabilities have increased dramatically, and new ICU/IMC beds in Hershey Medical Center provide high quality care to our most critically ill patients. We are proud of the dedication of our residents, faculty and other staff to outstanding patient care.


Number of Outpatient Visits Per Fiscal Year
16,000
15,500
15,000
14,500
14,000
13,500
13,000
2006/2007
2007/2008
2008/2009
Number of Outpatient Visits Per Fiscal Year


Number of Inpatient Discharges Per Fiscal Year
920
900
880
860
840
820
800
780
2006/2007
2007/2008
2008/2009
Number of Inpatient Discharges Per Fiscal Year


Hospital Length of Stay
7.00
6.00
5.00
4.00
3.00
2.00
1.00
-
2006/2007
2007/2008
2008/2009
GENERAL NEUROLOGY
STROKE NEUROLOGY


Number of Procedures Performed
20000
17500
15000
12500
10000
7500
5000
2500
0
2006/2007
2007/2008
2008/2009
EEG
EMG
EP
Botox

Research Activities

The Department of Neurology is very proud of its research accomplishments. Faculty members were authors or coauthors on 25 peer reviewed journal articles or chapters during 2008-2009. In addition, there were also 25 abstracts and meeting presentations. The number of research awards during 2008-2009 was 31, and the amount of total awards exceeded 2 million dollars. This represents considerable growth over the past few years.

Research projects range from NIH funded basic science to investigator initiated clinical trials to industry sponsored clinical trials. In addition to NIH and industry, foundations provide substantial support and several private donors provide generous funding for specific areas.

Although most faculty members are involved in research projects, several programs should be highlighted for their accomplishments. Drs. T. Subramanian and X. Huang are both well funded senior investigators whose focus is movement disorders. Dr. Subramanian's lab uses several animal models to study treatments for Parkinson's disease and dyskinesias. His laboratory has used human retinal pigment epithelial cells as possible transplantation candidates for Parkinson's disease, and Dr. Subramanian is an expert in basal ganglia electrophysiology, which he uses to assess the effectiveness of therapeutic interventions. Dr. Subramanian is also studying the effects of coenzyme Q10 in humans with Parkinson's disease, and participates in other national Parkinson's research trials. He has a special interest in spasticity outcomes using botulinum toxin. Dr. Huang is an NIH funded investigator whose major project focuses on structural MRI markers of Parkinson's disease. Her laboratory is also interested in the contribution of cerebellar circuits to the pathophysiology of Parkinson's disease. Both Dr. Subramanian and Huang have very active laboratories with graduate students and post-doctoral fellows. Dr. Venkiteswaran is also involved in research projects involving Parkinson's disease. She has been especially interested in the role of retina pigment epithelial cells in the treatment of this disorder.

Dr. Zach Simmons heads a multi investigator program which conducts research into a wide variety of issues associated with Amyotrophic Lateral Sclerosis (ALS). In addition to participating in national treatment trials for ALS, his group has demonstrated the presence of cognitive impairment in some ALS patients, and has developed an assessment tool to study this. Several members of his group are involved in studies of quality of life in ALS.

Dr. Paul Eslinger is involved in a number of interesting studies including functional brain imaging of memory and language, and functional brain imaging for childhood cancer patients. Dr. Eslinger is one of the most prominent neuropsychologists in America, and has been an outstanding senior mentor and collaborator for other faculty members within neurology and the College of Medicine.

Drs. Ray Reichwein and Kerstin Bettermann are the principle researchers in the stroke program. Dr. Reichwein is involved in a number of multicenter trials evaluating stroke treatment and prevention. Dr. Bettermann is involved in interesting studies of the effects of diabetes on the microvasculature in the retina and brain, and is also studying the association of inflammatory biomarkers with stroke.

Dr. David Gill is developing an exciting research agenda related to cognitive disorders, especially Alzheimer's disease. Working with Dr. Jim Connor and other collaborators, he is integrating several studies into the Memory Disorders Clinic.

The MS group, especially Dr. Turel, have been involved in multicenter treatment trials in patients with multiple sclerosis. Dr. Gary Thomas and Dr. Turel have investigated low dose Naltrexone as a possible treatment for multiple sclerosis, and are collaborating with Dr. Ian Zagon using a rodent model of demyelinating disease.

Finally, our faculty members have participated in several multicenter treatment trials of new epilepsy drugs. This area continues to develop.

This is by no means an exclusive list of research projects in the Department of Neurology. Neurology faculty members collaborate with researchers from multiple other departments within the College of Medicine, and there is a growing collaboration with faculty members at the University Park campus, as well as researchers in other institutions throughout the region and nation. Our growth in research has been quite dramatic, and we expect this will continue in the future.

Journal Articles and Book Chapters

1. **Berk, MA,** Salli, U, **Ramachandra, R, Venkiteswaran, K,** and **Subramanian, T**. Cografts of human retinal pigment epithelial (HRPE) cells prevent immune rejection and promote survival of striatal xenografts of human embryonic stem cells (HES). Cell Transplantation, Vol. 18, pp. 209, 2009.
2. **Bettermann, K,** Coker, LH, Hogan, PE, Bryan, NR, Kuller, LH, Margolis, KL, Wallace, RB, Lao, Z, Freeman, R. Stefanick, ML, Shumaker, SA. For the Women's Health Initiative Memory Study. Postmenopausal hormone therapy and subclinical cerebrovascular disease: The WHIMS-MRI Study. Neurology 2009;72:125-134.
3. **Eccher M,** Nair D. The Irritative Zone. In: Luders HO, ed. Epilepsy Surgery, 3Ed. Philadelphia: Lippincott Williams & Wilkins, 2008.
4. **Eslinger PJ,** Biddle KR. Prefrontal cortex and the maturation of executive functions, cognitive expertise, and social adaptation. In Anderson V, Jacaobs R, Anderson PJ (Eds.) Executive Functions and the Frontal Lobe: A Lifespan Perspective, Taylor & Francis: New York, 2008.
5. **Eslinger PJ**. The frontal lobe: Executive, emotional, and neurological functions. In Marien P & Abutalebi J (Eds.) Neuropsychological Research. A Review, Psychology Press: Hove and New York, 2008.
6. **Eslinger, PJ**. The frontal lobe: Executive, emotional, and neurological functions. In Marien P (Ed.) Progress in Neuropsychology [pp. 279-408]. Psychology Press: Hove and New York, 2008.
7. **Eslinger, PJ, Robinson-Long, M, Realmuto, J,** Moll, J, Oliveira-Souza de, Moll, F, Wang, J, Yang, QX. Developmental frontal lobe imaging and moral judgment: Arthur Benton's enduring influence 60 years later. Journal of Clinical and Experimental Neuropsychology, 31:158-169, 2009.
8. **Eslinger, PJ,** Blair, C, Wang, J, Lipovsky, B, **Realmuto, J,** Baker, D, Thorne, S. Gamson, D, Zimmerman, E, Rohrer, L, Yang, QX. Developmental shifts in fMRI activations during visuospatial relational reasoning. Brain and Cognition, 69:1-10, 2009.
9. **Flaherty-Craig C, Brothers A,** Dearman, B, **Eslinger P,** and **Simmons Z**. Penn State Screen Exam for the detection of frontal and temporal dysfunction syndromes: Application to ALS. Amyotroph Lateral Scler. 2008 Sept 16:1-6 [Epub ahead of print].
10. Garza JP, **Eslinger PJ,** Barrett AM. Perceptual-attentional and motor-intentional bias near and far space. Brain and Cognition 68:9-14, 2008.
11. **Gill, DJ,** Freshman, A, Blender JA, Ravina B. The Montreal Cognitive Assessment as a screening tool for cognitive impairment in Parkinson's disease. Movement Disorders. 2008;23:1043-1046.
12. **Jha, B, Kothari, M**. Hypersense or pseudohyperdense MCA sign: a Damocles sword? Neurology 2009;72:e118.
13. **Lewis, MM,** Smith, AB, Styner, M, Gu, H, Li, Y, Barbero, X, Gouttard, X, McKeown, M, **Mailman, R., Huang, X**. Lateralized ventricular enlargement in Parkinson's disease. European J. of Neurology. PMID 19187264, Epub January 27, 2009.
14. **Lieu, CA, Marupudi, NI, Berk, MA, Ramachandra, R, and Subramanian, T.** Interhemispheric nigrostriatal connections and their potential role in the genesis of drug-induced dyskinesias in Parkinson's disease cell transplantation, Vol. 18, pp. 222, 2009.
15. **Lowden, MR, Scott, K, Kothari MJ**. Familial Creutzfeldt-Jakob disease presenting as epilepsia partialis continua. Epileptic Disord 2008;10(4):271-275.

16. **Marupudi, NI, Lieu, C,** Tombran-Tink, J**, Ramachandra, R, and Subramanian, T.** Intrastriatial administration of pigment epithelium-derived growth factor (PEDF) ameliorates 6-OHDA-mediated neurotoxicity in hemiparkinsonian rats. Cell Transplantation, Vol. 18, pp. 225, 2009.
17. McKeown, MJ, Uthama, A, Abugharbieh, R, Palmer S, **Lewis MM, and Huang, X**. Shape (But Not Volume) Changes in the thalami in Parkinson Disease. BMC Neurology: 2008 8:8.
18. Murphy, V, Felgoise, SH, Walsh, SM, **Simmons, Z**. Problem-solving skills predict quality of life and psychological morbidity in ALS caregivers. Amyotroph Lateral Scler 2009;10:14-153.
19. Nord K, **Kapoor P, Fisher J, Thomas G, Sundaram A, Scott K, Kothari MJ**. False positive rate of thoracic outlet syndrome diagnostic maneuvers. Electromyogr. Clin Neurophysiol 2008;48:67-74.
20. Satish, U, Streufert S, **Eslinger PJ**. Simulation-based executive cognitive assessment and rehabilitation after traumatic frontal lobe injury: A case report. Disability and Rehabilitation Research, 30:468-78, 2008.
21. Sawaki: L, Butler AJ, Leng X, Wassenaar PA, Mohammad YM, Blanton S. Sathian K, Nichols-Larsen DS, Wolf SL, **Good DC,** Wittenberg GF. Constraint-induced movement therapy results in increased motor map area in subjects 3 to 9 months after stroke. Neurorehabil Neural Repair 2008;22:505-513.
22. **Scott K,** Zeris S, **Kothari MJ**. Elevated B6 levels and peripheral neuropathies. Electromyogr. Clin Neurophysiol 2008; 48:219-223.
23. **Simmons, Z**. What's in the literature? J Clin Neuromusc Dis 2008;10:29-34.
24. **Somyreddy K, Kothari MJ**. Nitrous oxide induced subacute combined degeneration of spinal cord: a case report. Electromyogr. Clin Neurophysiol 2008;48:225-228.
25. **Tenser, RB**. Ethics of placebo-controlled trials in multiple sclerosis. Neurology 2009; 72:1191-1192.

Abstract & Meeting Presentations

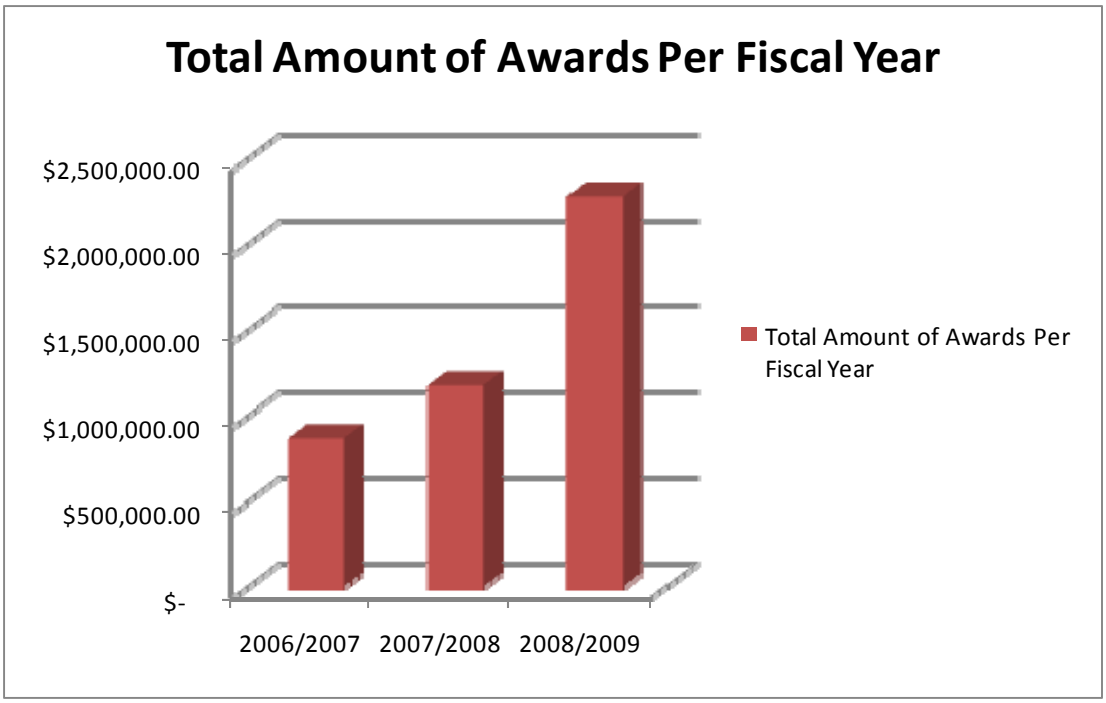
1. Bigler, DC., Aksu, Y., **Stephens, HE.,** Vesek, J., **Scott, KR., Flaherty-Craig, C.,** Wang, J., **Eslinger, PJ., Simmons, Z.,** Yang, QX. High-resolution Longitudinal Voxel-Based Morphometric Study in ALS. Proc. Intl. Soc. Mag. Reson. Med. 17 (2009).
2. **Eccher, M,** Geyer N, Rodriguez S, Cheriyath P, **Trescher W**. Survey of child neurologists regarding treatment of benign epilepsy with controtemporal spikes. American Epilepsy Society annual meeting, December 2008.
3. Felgoise, S, Rodriquez, J, **Stephens, H,** Walsh, S, Bremer, B, **Simmons, Z**. Validation of a shorter ALS-specific quality of life instrument: the ALSSQOL-R. 19th International Symposium for ALS/ MND, Birmingham, England, November 3-5, 2008.
4. **Flaherty-Craig, C, Brothers, A,** Dearman, B, **Eslinger, P, Simmons, Z**. Rapid screen exam for the detection of frontal and temporal dysfunction syndromes: application to ALS. 19th International Symposium for ALS/MND, Birmingham, England, November 3-5, 2008.
5. Heatwole, C, **Gill, D,** Jozefowics, R, Teaching Neurology in the Footsteps of Copernicus, Babinski, and the Pope: The Rochester to Krakow Connection. Presented at the American Academy of Neurology Annual Meeting, April, 27, 2009.
6. **Kumaraswamy, G, Subramanian, T, Lieu, CA, Berg, D**. Transcranial ultrasound detection of MPTP induced substantia nigra hyperechogenicity in rhesus monkeys. Central PA Society for Neuroscience Symposium, Hershey, PA, November 18-19, 2008.
7. **Lewis, MM,** Smith, AB, Styner, M, Gu, H, Poole, R, Zhu, H, Li, Y, Barbero, X, Gouttard, S, McKeown, MJ, **Mailman, RB,** and **Huang, X**. Asymmetrical lateral ventricular enlargement in Parkinson's disease. Pennsylvania State University Neuroscience Research Days, November 22, 2008.
8. **Lewis, MM,** Smith, AB, Styner, M, Gu, H, Poole, R, Zhu, H, Li, Y, Barbero, X, Gouttard, S, McKeown, MJ, **Mailman, RB,** and **Huang, X**. Asymmetrical lateral ventricular enlargement in Parkinson's disease. Second Annual International Symposium on Neuroimaging in Parkinson's Disease and Related Disorders, Chatham, MA, October 21, 2008.
9. **Lewis, MM, Sen, S,** Chen, W, Lee, S, Truong, Y, McKeown, MJ, and **Huang, X**. The effect of levodopa on motor pathways in healthy subjects: a functional MRI (fMRI) study. Presented at the 13th International Congress of Parkinson's Disease and Movement Disorders, Paris, France, June 9, 2009.
10. **Lieu, CA, Stull, AM, Petticoffer, AC, Manyam, BV, Subramanian, T**. Drug-induced dyskinesias and the involvement of DARPP-32 in the hemiparkinsonian rat. Penn State Neuroscience Research Day, Hershey, PA, November 22, 2008.
11. **Lowden, MR, Stephens, HE, Simmons, Z, Scott, KR**. Moderate intensity resistance training does not significantly alter disease progression in a representative group of ALS Patients. American Academy of Neurology Annual Meeting, 2009.
12. **Mathers, RC, Stull, AM, Kumaraswamy, GK,** Krady, JK, **Venkiteswaran, K, Subramanian, T**. Striatal immune response in rats to cografts of human retinal pigment epithelial (hRPE) cells and mouse fetal ventral mesencephalic (FVM) cells. Central PA Society for Neuroscience Symposium, Hershey, PA, November 18-19, 2008.

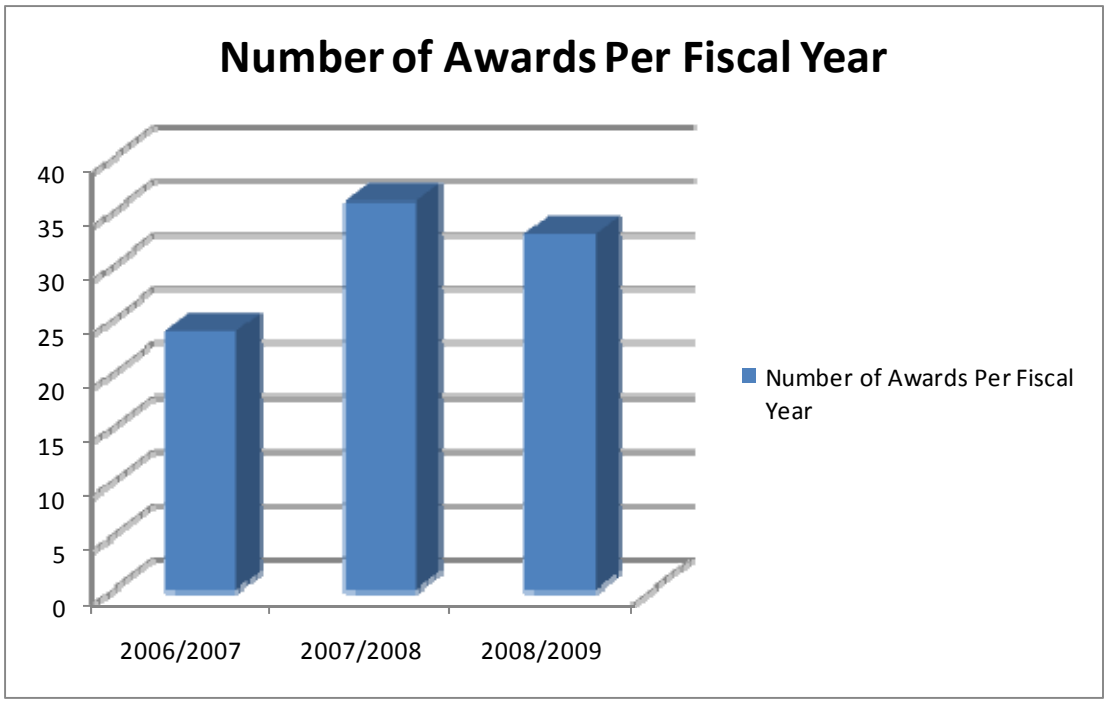
13. **Mathers, RC, Stull, AM, Kumaraswamy, GK, Krady, JK, Venkiteswaran, K, Subramanian, T**. Striatal immune response in rats to cografts of human retinal pigment epithelial (hRPE) cells and mouse fetal ventral mesencephalic (FVM) cells. Penn State Neuroscience Research Day, Hershey, PA, November 22, 2008.
14. Mitchell, RM, Randazzo, WT, Freeman, WM, **Stephens, HE, Simmons, Z,** Connor, JR. CSF biomarkers can identify ALS patients and reveal influences of HFE polymorphisms. 19th International Symposium for ALS/MND, Birmingham, England, November 3-5, 2008.
15. Mitchell, R, Traynor, B, **Stephens, H, Simmons, Z,** Connor, J. Association of the H63D allele with amyotrophic lateral sclerosis. 19th International Symposium for ALS/MND, Birmingham, England, November 3-5, 2008.
16. **Ramachandra, R, Venkiteswaran, K,** Elmslie, KS, **Subramanian, T**. In vitro slice model of rat basal ganglia: a tool to study cell transplantation and its effects on basal ganglia physiology. Central PA Society for Neuroscience Symposium, Hershey, PA, November 18-19, 2008.
17. **Ramachandra, R, Pinzon-Guzmon, C, Venkiteswaran, K, Elmslie, K, Subramanian, T**. Invitro transplantation studies of human retinal pigment epithelial cell (hRPEC) transdifferentiated neurons into basal ganglia slice culture. Penn State Neuroscience Research Day, Hershey, PA, November 22, 2008.
18. **Sen, S,** Kawaguchi, A, Truong, Y, **Lewis, MM,** Liu, X, **Eslinger, PJ,** McKeown, MJ, and **Huang, X**. Task and speed-specific recruitment of neural pathways during sequential finger movements. Pennsylvania State University Neuroscience Research Days, November 22, 2008.
19. **Sen, S,** Truong, Y., **Lewis, MM, and Huang, X**. Task-specific recruitment of cerebello-thalamo-cortical motor circuitry during progression of Parkinson's disease. Presented at the 13th International Congress of Parkinson's Disease and Movement Disorders, Paris, France, June 11, 2009.
20. Stayer, CJ, Bremer, BA, Green, BL, **Brothers, A,** Brussock, C, D'Angelo, T., Felgoise, SH, Gascho, B, Hill, S, Lyter, J, Paul, Z, Rodriguez, J, **Stephens, HE,** Walsh, S, Yates, J, Young, J, **Simmons, Z**. Development of evidence-based standards of care for optimizing the quality of life of caregivers of individuals with Amyotrophic Lateral Sclerosis: A systematic review of the literature. Presented at the Society of Behavioral Medicine 30th annual meeting, Montreal, Canada, April 22-25, 2009.
21. **Stephens, HE,** Walsh, SM, **Simmons, Z**. A national survey of quality of life for ALS patients in the United States. 19th International Symposium for ALS/MND, Birmingham, England, November 3-5, 2008.
22. Tandan, R, Bromberg, MB, Kasarskis, EJ, Mitsumoto, HM, **Simmons, Z,** Matthews, DB. Water turnover in ALS measured by the doubly labeled water method. 19th International Symposium for ALS/MND, Birmingham, England, November 3-5, 2008.
23. **Thomas, GA,** Rahn, KA, McLaughlin, J, **Turel, AP,** and Zagon, I. Methionine enkephalin prevents and reverses clinical disease of EAE in mice: Implications for a biologic approach to treating multiple sclerosis. Abstracts of the 2nd World Congress on Controversies in Neurology.
24. **Turel, AP,** Rahn, KA, McLaughlin, J, **Thomas, GA,** and Zagon, I. Low-dose Naltrexone (LDN) reduces inflammatory response and demyelination, and attenuates behavioral scores in MOG-induced EAE Mice. Abstracts of the 2nd World Congress on Controversies in Neurology.
25. Wiley, N, Mitchell, R, Madhankumar, A, **Simmons, Z,** Connor, J. Targeted liposomes for treatment of ALS in mutant SOD1 mouse model**.** 19th International Symposium for ALS/MND, Birmingham, England, November 3-5, 2008.

Research Projects

1. **Bettermann, Kerstin,** Effects of Early Diabetes on the Microvasculature: A Link Between the Eye, Brain and Heart? PA Tobacco Settlement Fund (TSF).
2. **Eccher, Matthew,** An International, Double-Blind, Randomized, Multi-Center, Parallel Group, Historical-Control Conversion to Monotherapy Study to Evaluate the Efficacy and Safety of Drug A in Subjects with Partial Onset Seizures with or without Secondary Generalization. UCB Pharma.
3. **Eccher, Matthew,** An Open-label, Multinational, Multicenter, Follow-up Study to Evaluate the Long-term Safety and Efficacy of Drug A, Used at Flexible Dose up to a Maximum of 150mg/day, in S. UCB Pharma.
4. **Eslinger, Paul J,** Functional Brain Imaging Resources for Childhood Cancer Patients. Children's Miracle Network.
5. **Eslinger, Paul J**, Functional Brain Imaging of Memory and Language for Epilepsy Surgery. PA Tobacco Settlement Fund (TSF).
6. **Gill, David J,** Validating the Montreal Cognitive Assessment for the Diagnosis of Mild Cognitive Impairment in Parkinson's Disease. University of Toronto.
7. **Huang, Xuemei,** Structural MRI Marker(s) of Parkinson's Disease. National Institute of Neurological Disorders and Stroke.
8. **Reichwein, Raymond K,** RESPECT Trial - Randomized Evaluation of Recurrent Stroke Comparing PFO Closure to Established Current Standard of Care Treatment. AGA Medical Corporation.
9. **Reichwein, Raymond K**, Adherence Evaluation After Ischemic Stroke Longitudinal Registry (AVAIL). Duke University.
10. **Scott, Kevin,** A Multi-center, Double-blind, Placebo-controlled Study to Investigate the Safety and Efficacy of Lithium in Combination with Drug A in Volunteers With ALS. Massachusetts General Hospital.
11. **Simmons, Zachary,** Clinical Trial of Drug A in Subjects with ALS. Massachusetts General Hospital.
12. **Simmons, Zachary,** A Multicenter Study for the Validation of ALS Biomarkers. Massachusetts General Hospital.
13. **Simmons, Zachary,** Development of Evidence-Based Practice Guidelines for Caregivers of Individuals with ALS and Cognitive Impairment: Pilot Study of a Psychoeducational Approach. Amyotrophic Lateral Sclerosis Association (ALSA).
14. **Simmons, Zachary,** A 2-part, Randomized, Double-blind, Safety and Tolerability Study Evaluating KNS-760704 in Patients with Amyotrophic Lateral Sclerosis (ALS). Knopp Neurosciences Inc.
15. **Simmons, Zachary,** An Open-label, Safety and Tolerability Study Evaluating Drug A in Patients with Amyotrophic Lateral Sclerosis (ALS). Knopp Neurosciences Inc.
16. **Subramanian, Thyagarajan,** Macuna Pruriens for Dyskinesias in Parkinson's Disease. National Center for Complementary and Alternative Medicine.
17. **Subramanian, Thyagarajan,** Intranigral Transplantation in Parkinsonian Monkeys. National Institute of Neurological Disorders and Stroke.
18. **Subramanian, Thyagarajan,** Study of Pulmonary Function in Patients with Reduced Lung Function Treated with Botox. Allergan, Inc.
19. **Subramanian, Thyagarajan,** PROS (Patient Registry Outcomes in Spasticity) Care. Albert Einstein Healthcare Network.

20. **Subramanian, Thyagarajan,** Effects of Coenzyme Q10 in Parkinson Disease-Phase III. Cornell University.
21. **Subramanian, Thyagarajan,** A Longitudinal Observational Follow Up of the PreCEPT Study Cohort (PostCEPT). University of Rochester.
22. **Subramanian, Thyagarajan,** Human Retinal Pigment Epithelial Cell (hRPEC) Mediated Ex-vivo Gene Therapy in Parkinson's Disease. PA Tobacco Settlement Fund (TSF).
23. **Subramanian, Thyagarajan,** Modulation of Basal Ganglia Electrophysiology by Dopaminergic Cell Transplant. PA Tobacco Settlement Fund (TSF).
24. **Turel, Anthony P,** An Open-label Extension Trial to Determine tolerability and Efficacy of Long-term Drug A as Adjunctive therapy in Patients with Partial Seizures. Quintiles, Inc.
25. **Turel, Anthony P,** Drug Study in Patients with Uncontrolled Partial Seizures. Quintiles, Inc.
26. **Turel, Anthony P,** A Multinational, Multicenter, Randomized, Double-blind Parallel-group, Placebo-controlled Study, To Evaluate the Safety, Tolerability and Efficacy of Daily Oral Administration. TEVA Pharmaceutical Industries, Ltd.
27. **Turel, Anthony P,** A Randomized, Multicenter, Double-blind, Placebo-controlled, Dose-comparison Study to Determine the Efficacy and Safety of Drug A in Subjects with Relapsing-Remitting Multiple Sclerosis. BIOGEN.
28. **Venkiteswaran, Kala,** Understanding Immune Privilege of Human Retinal Pigment Epithelial Cells (HRPEC) Transplants in Parkinson's Disease (PD). Barsumian Trust.
29. **Venkiteswaran, Kala,** Transplantation of Transdifferentiated Dopaminergic Neurons Derived from Human Retinal Pigment Epithelial Cells (hRPEC). American Parkinson Disease Association.


Total Amount of Awards Per Fiscal Year
$2,500,000.00
$2,000,000.00
$1,500,000.00
$1,000,000.00
$500,000.00
$-
2006/2007
2007/2008
2008/2009
Total Amount of Awards Per Fiscal Year


Number of Awards Per Fiscal Year
40
35
30
25
20
15
10
5
0
2006/2007
2007/2008
2008/2009
Number of Awards Per Fiscal Year

Teaching Activities

Our faculty teach in many settings. In the College of Medicine, most participate in the Neural and Behavioral Science course for second year medical students. Dr. T. Subramanian is the co-course director of this major effort. All neurology faculty also participate in the NBS problem based learning sessions. This involves meeting with a small group of students a total of nine times, to discuss specific cases which are illustrative of major teaching points in association with the NBS lecture series.

Dr. Gary Thomas is in charge of the neurology physical examination teaching sessions, and also is the director of the very successful neurology "island day." In this event, a variety of actual and simulated patients are interviewed by groups of students under faculty supervision. Specific learning issues are developed for each case. This program, held at the beginning of their third year has been very popular with medical students.

Dr. Milind Kothari, our Vice Chair for Education, is extremely active in our teaching mission, and serves on a number of committees including the Admissions Committee, the Clerkship Directors Committee, and Distinguished Educators Society. At the national level, he serves on the American Academy of Neurology Residency In-service Training Exam Subcommittee, and the American Association of Neuromuscular and the Electrodiagnostic Medicine Graduate Medical Education and Neuromuscular Training Program Committees. Dr. Kothari has won a number of teaching awards including the College of Medicine Distinguished Educator Award, as well as national teaching recognition awards through the American Academy of Neurology. Dr. Kothari is also the Director of the Neurology Student Clerkship. The clerkship has been extremely successful and receives very high marks from our medical students, consistently ranking first or second in student surveys. The clerkship is organized around a series of video lectures, case vignettes, and morning lectures, as well as traditional ward and clinic experiences. All faculty members participate in the Neurology Clerkship.

The neurology residency program increased from two to four residents each year several years ago. Our department has been very successful in the neurology match, completely "filling" all positions for the last two years. We are very pleased with the quality of our residents, and are proud that 100% of our recent neurology resident graduates have successfully passed the American Board of Psychiatry and Neurology. The residency program includes rotations at the Lebanon VA Hospital, and in pediatric neurology, psychiatry, and neuroradiology, among others. Dr. David Gill assumed the directorship of the neurology residency program this year, and under his leadership, several minor modifications to the program have been initiated.

The department sponsors two popular fellowships in Neurophysiology and in Neuromuscular Disorders. The demand for these two fellowships is great, both from our own residents and residents from other institutions. Dr. Kevin Scott serves as the Program Director for both fellowships. This year, the department was also successful in obtaining certification for a Vascular Neurology (stroke) fellowship with Dr. Kerstin Bettermann as the Program Director. We hope that the first fellow will start in July 2010.

Our faculty participate in many other educational activities. Dr. Ray Reichwein is the Director of the popular annual Capital Region Stroke Symposium. Dr. Milind Kothari is the Course Director for our annual Neurology for the Non-Neurologist Seminar. Our faculty participate in a variety of other CME activities throughout the region and nation, and a number have been invited as visiting professors by other institutions.

The department is also involved in outreach educational activities within the region, providing lectures in many neurological subject areas including movement disorders, stroke, cognitive disorders, multiple sclerosis, and others. In association with the Penn State Neuroscience Institute, we participated this year in a community neuroscience day in which a number of lectures were presented to the general public. Dr. Subramanian has also organized community activities, including a Neuroscience Day at the Whitaker Center in Harrisburg for the past several years. Faculty members also participate in health fairs throughout the region.

Invited Presentations

1. **Bettermann, K**. Stroke Management in the Elderly. Neurology Grand Rounds, PSU, February 6, 2009.
2. **Eslinger, PJ**. Functional Brain Imaging of Recovery after Early Frontal Lesion and in Social Cognitive Development. Invited lecture, University of Groningen Medical Center, Groningen NL, July 1, 2008.
3. **Eslinger, PJ**. Social Decision-Making in FTD in Relation to Executive Functions and Empathy. Invited symposium presentation at the Meeting of the World Federation of Neurology Research Group on Aphasia and Cognitive Disorders, Edinburgh, August 30, 2008.
4. **Eslinger, PJ**. Attaining and Maintaining Lifelong Cognitive and Brain Fitness. Council of State Library Agencies in the Northeast, Hershey, PA, October 6, 2008.
5. **Eslinger, PJ**. Altered Functional Brain Activity for Math after Childhood Cancer. Grand Rounds presentation to the National Academy of Neuropsychology, New York City, October 24, 2008.
6. **Eslinger, PJ**. Developmental Implications of Early Frontal Lobe Function and Dysfunction: Evidence from Lesion and Functional Imaging. Continuing education workshop organized for the International Neuropsychological Association Annual Meeting, Atlanta, GA, February12, 2009.
7. **Eslinger, PJ**. Executive Functions Across the Lifespan: Invited symposium organized for the International Neuropsychological Society Annual Meeting, Atlanta, GA, February 12, 2009.
8. **Flaherty-Craig, C, Eslinger P,** Bigler D and **Simmons, Z**. Brain Imaging Validation of a Cognitive Screen Exam of Frontal and Temporal Dysfunction in ALS. Frontotemporal Association 2008 Annual Meeting, Rotterdam, Netherlands, September 4, 2008.
9. **Gill, DJ**. Update on Alzheimer's Disease. Alzheimer's Association, Greater Philadelphia Chapter, Harrisburg, Pennsylvania, Eleventh Annual Education and Research Conference, November 13, 2008.
10. **Good, DC**. Randomized Clinical Trials in Stroke Rehabilitation. Presented at 5th World Congress for Neurorehabilitation, Brasilia, Brazil, September 25, 2008.
11. **Good, DC**. New Approaches to Facilitate Motor Recovery in Stroke. Presented at 5th World Congress for Neurorehabilitation, Brasilia, Brazil, September 26, 2008.
12. **Good, DC**. Welcome address, 2008 American Congress of Rehabilitation Medicine-American Society of Neurorehabilitation, Joint Educational Conference, October 16, 2008.
13. **Good, DC**. Enhancing Recovery Following Stroke and Brain Injury, presented at Neurorehabilitation 2008: The Traumatized Brain. Kessler Institute for Rehabilitation, West Orange, New Jersey, November 7, 2008.
14. **Good, D**. Post-Stroke Chronic Conditions: Overview and Implications for Stroke Survivors/ Caregivers/Clinicians and Health Economics. Post-Stroke Disability, Global Expert Roundtable. Hilton Stockholm Slussen, Stockholm, Sweden, May 24, 2009.
15. **Good, D**. Principles of Neuro-Rehabilitation. Neurology for the Non-Neurologist. Penn State College of Medicine. Holiday Inn Harrisburg East, Harrisburg, Pennsylvania, May 29, 2009.
16. **Good, D**. Probing Question: What is "Talk and Die" Syndrome. Research/Penn State http://www.rps.psu.edu/probing/talkanddie.html.
17. **Hills, E**. Physical Medicine and Rehabilitation, Noon Conference, Holy Spirit Hospital Department of Medicine, Camp Hill, PA, July 10, 2008.

18. **Hills, E**. Physical Medicine and Rehabilitation, Noon Conference, Holy Spirit Hospital Department of Social Services, Camp Hill, PA, August 21, 2008.
19. **Hills, E**. Neurotrauma Rehabilitation, Neurology Grand Rounds, Penn State Continuing Education and Department of Neurology, Hershey, PA, August 29, 2008.
20. **Huang, X**. Early detection of Parkinson's disease, Neurology Grand Rounds, PSU-HMC, December 5, 2008.
21. **Huang, X**. MRI in Parkinson's disease. Research seminar for NIEHS, January, 2009.
22. **Huang, X**. MR Imaging in Parkinson's disease. NIEHS, RTP, North Carolina, April 7, 2009.
23. **Huang, X**. Update of Movement Disorders and Parkinson's Disease, CME for Physicians at the Medical Center, South Boston, VA. Halifax Medical Center, July 22, 2008.
24. **Ross, S**. Head Pain Enigmas. Grand Rounds, Carlisle Regional Hospital. September 19, 2008.
25. **Ross, S**. Primary Headache Overview, Pain Management Fellowship (lectures to the fellows and faculty), Pain Management Division of Anesthesiology. February 25, 2009.
26. **Ross, S**. Headache Overview with a Strategic Approach to Management, Neurology for the Non-neurologist, Penn State Neurology Symposium, Harrisburg, PA, May 29, 2009.
27. **Ross, S**. Chronic Daily Headache, Family Medicine Section of the National Medical Assoc., Atlanta, GA, July 30, 2008.
28. **Ross, S**. Headache, for Penn State Otolaryngology, Hershey, PA. August 22, 2008.
29. **Simmons, Z**. ALS: Combining Clinical Care and Research to Benefit Patients. Brain Talk, Penn State Hershey Medical Center, October 4, 2008.
30. **Simmons, Z**. Validation of a Shorter ALS-Specific Quality of Life Instrument: The ALSSQOL-R. 7th Annual Meeting, North East ALS Consortium, Boston, MA, October 4, 2008.
31. **Simmons, Z**. Guillain-Barre Syndrome, Course taught at American Academy of Neurology Annual Meeting, April 26, 2009.
32. **Subramanian, T**. "The Eye to the Rescue of the Brain. RPE Transplantation for Parkinson's Disease". Invited speaker for Grand Rounds at the University of Tubingen & Hertie Institute for Clinical Brain Research, Tubingen, Germany, September 8, 2008.
33. **Subramanian, T**. The Eye to the Rescus of the Brain—Lessons in Neuroimmunology. Penn State Neuroscience Research Day, Hershey, PA November 22, 2008.
34. **Subramanian, T, Venkiteswaran, K**. Human Retinal Pigment Epithelial Cell (hRPEC) Cotransplants Protect Mouse Fetal Ventral Mesencphalic Striatal Xenografts from Immune Rejection. Abstract and Poster Presentation for INTR10 Conference in Freiburg, Germany, September 9, 2008.
35. **Tenser, RB**. Varicella-Zoster Infection of the Nervous System. Department of Neurology, University of Southern California School of Medicine, November 11, 2008.
36. **Tenser, RB**. Multiple Sclerosis-Epidemiology to Treatment. CME, Dubois Regional Medical Center, October 25, 2008.
37. **Tenser, RB**. Herpes simples virus encephalitis, Neurology Grand Rounds, University of Southern California School of Medicine, February 11, 2009.
38. **Tenser, RB**. Multiple Sclerosis-Epidemiology to Treatment, Neurology Grand Rounds, Penn State University College of Medicine, March 27, 2009.
39. **Tenser, RB**. Herpes Simplex Virus Latent Infection. Penn State Hershey Eye Center, Frontiers in Eye and Vision Research, May 28, 2009.

2008-2009 Visiting Professors

1. Gregory Bergey, MD, Professor of Neurology, Director, Johns Hopkins Epilepsy Center, Vice-Chair for Neurological Laboratories, Johns Hopkins University
2. Jose Biller, MD, FAAN, FACP, FAHA, Professor and Chairman, Department of Neurology, Loyola University Chicago, Stritch School of Medicine
3. Cathrin Buetefisch, MD, Assistant Professor, Neurology & Physiology, West Virginia University School of Medicine
4. Andrew Craig Charles, MD, Director, UCLA Headache Research and Treatment Program, UCLA School of Medicine
5. Terry D. Fife, MD, FAAN, Associate Professor of Clinical Neurology, University of Arizona
6. Romergryko Geocadin, MD, Associate Professor of Neurology, Neurosurgery & Anesthesiology-Critical Care Medicine, Director, Neuroscience Critical Care Unit, The Johns Hopkins Hospital
7. Gerald Herbison, MD, Professor of Physical Medical and Rehabilitation, Jefferson Medical College
8. Robert Kaniecki, MD, Director, The Headache Center, Chief, Headache Division, University of Pittsburgh
9. Robert T. Leshner, MD, Director, Neuromuscular Diseases, Professor of Neurology and Pediatrics, Children's National Medical Center, Washington, DC
10. Geoffrey S. F. Ling, MD, PhD, Colonel, Medical Corps, US Army, Professor and Vice Chair of Neurology, Director, Critical Care Medicine for Anesthesiology and Surgery, Uniformed Services University of the Health Sciences
11. Bala Manyam, MD, Adjunct Professor, Department of Neurology, Southern Illinois University School of Medicine
12. Justin McArthur, MBBS, MPH, Director, Department of Neurology, Professor of Neurology, Pathology & Epidemiology, Johns Hopkins University
13. Robert W. Neumar, MD, PhD, FACEP, Associate Professor of Emergency Medicine, University of Pennsylvania School of Medicine, Hospital of the University of Pennsylvania
14. Ronald Petersen, PhD, Director of Alzheimer's Disease Research Center, Mayo Clinic
15. William Weiner, MD, Professor and Chairman, University of Maryland School of Medicine, Department of Neurology, Director, Maryland Parkinson's Disease and Movement Disorders Center
16. Richard Young, MD, Associate Clinical Professor of Pediatrics and Neurology, Yale University School of Medicine

Other Evidence of Professional Reputation

1. **Eslinger, PJ,** Editorial Board-Cognitive and Behavioral Neurology
2. **Eslinger, PJ,** Editorial Board-Developmental Neuropsychology
3. **Gill, D,** Distance Learning Subcommittee, American Academy of Neurology
4. **Good, DC,** Chair, Data Safety Monitoring Board, VA Cooperative Study 558, Robotic Assisted Upper Limb Neurorehabilitation in Stroke Patients
5. **Good, DC,** Member, Circulatory Device Panel, Center for Devices and Radiological Health, Food and Drug Administration
6. **Good, DC,** Member, Accreditation Council, United Council for Neurologic Subspecialties
7. **Good, DC,** Member, NIH, NICHHD, Special Emphasis Panel, ZH1 MCHG-BJK Rehabilitation Research Training, December 8, 2008
8. **Good, DC,** Consultant, Circulatory System Devices Panel, Center for Devices and Radiological Health, Food and Drug Administration. WATCHMAN® Left Atrial Appendage Occluder, Gaithersburg, Maryland, April 23, 2009
9. **Good, DC,** Program Committee, 6th World Congress for Neurorehabilitation, Vienna, Austria, 2010
10. **Simmons, Z,** Course Chair, Cognitive and Psychological Change. 19th International Symposium on ALS/MND, Birmingham, England, November 3-5, 2008
11. **Simmons, Z,** Editorial Board, Amyotrophic Lateral Sclerosis
12. **Simmons, Z,** Editorial Board, Journal of Clinical Neuromuscular Disease

Faculty Interviews

1. **Gill, D,** "Detecting Alzheimer's" Patriot News Body & Mind Magazine, July 29, 2008.
2. **Gill, D,** Interview for Alzheimer's Disease episode on Health Smart on WITF. Aired December 17, 2008.

Faculty Awards

1. **Acharya, J,** Best Doctors in America
2. **Gill, D,** Resident Teacher of the Year (2008-2009)
3. **Good, D,** Best Doctors in America
4. **Kothari, M,** AB Baker Teacher Recognition Certificate (2008)
5. **Kothari, M,** Harvard Macy Institute Scholar (2008)
6. **Kothari, M,** Outstanding Mentor, awarded by Class of 2008
7. **Kothari, M,** Best Doctors in America
8. **Ross, S,** Best Doctors in America
9. **Tenser, R,** Best Doctors in America

Future Directions

The Department of Neurology is an important component of the Neuroscience Institute chaired by Dr. Bob Harbaugh. The Neuroscience Institute includes faculty members in neurology, neurosurgery, psychiatry, neuroradiology, pediatric neurology and neuroophthalmology. The Institute provides integrated clinical and research services to patients with neurological disorders. Close integration is especially evident in the stroke center, neurodegenerative disorders center, and the epilepsy program. Collaborative research projects include faculty from several other College of Medicine departments, as well as colleagues from University Park. The Neuroscience Institute is one of the major priorities of Hershey Medical Center, and continues to develop and expand its clinical and research programs.

The Neurology Department continues to grow its faculty, and currently is recruiting new faculty members for stroke, epilepsy, neuromuscular disorders and general neurology. We hope to continue to expand our outpatient services, and improve access to patients and referring physicians. A novel new concept is the "walk in" neurology clinic organized by Dr. Steve Ross. This unique clinic sees patients on a first come first serve basis, who otherwise might have to wait weeks or even months for an appointment. The response from patients and referring physicians has been very positive. This may be a model for other clinics at Hershey Medical Center.

The Department of Neurology, which is only six years old, continues to mature. We strive to provide the utmost in quality patient care, high quality education for students, residents, fellows, and the general public, and cutting edge basic science and translational research in select areas of faculty expertise. We are pleased with the progress our young department has made, and look forward to a bright future as a key part of the Neurosciences Institute, the College of Medicine, and Hershey Medical Center.